

EARBA STORAGE

A GILKES ENERGY COMPANY

Earba Pumped Storage Hydro Scheme EIA Report

Appendix 10.2: Ornithology Field Survey Methodology

February 2024



Quality Information

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1.1 Introduction

- 1.1.1 A targeted ornithological field survey, concentrating on locally important and legally protected bird species in the vicinity of the Proposed Development was undertaken by Mike Coleman Ecology between April 2022 and July 2023.
- 1.1.2 Care was taken to ensure that survey methods and the level and type of survey effort was consistent with NatureScot guidance available at the time surveys commenced. This report provides an overview of the surveys undertaken, and a spreadsheet of the records obtained.
- 1.1.3 All field survey records have previously been fully reported in the Mike Coleman Ecology documents *Earba Pumped Storage Hydro Scheme – Ornithology Report* (March 2023) and *Earba Pumped Storage Hydro Scheme – Breeding Bird Survey 2023 Report* (August 2023). Due to the confidential nature of some records, both reports can be found in **Appendix 10.1 - Ornithology – Confidential Annex** of the EIAR.

1.2 Survey Background

Study Area

- 1.2.1 The ornithological survey area incorporated the Moy access track, which traverses sections of open moorland and acid grassland mosaic, with areas of marshy inundation in lower lying areas in the west and south of the proposed site. The survey also included a small area of mixed woodland north of the Earba lochans.
- 1.2.2 Lochan na h-Earba is formed of two distinct waterbodies with a marshy area of grassland between them. The land adjacent to Lochan na h-Earba is open heather moorland with scattered Scot's Pine (*Pinus sylvestris*), Rowan (*Sorbus aucuparia*) and birch (*Betula* spp.) as the land climbs into the craggy façades of Creag a' Chuir, Creag a'Mhaigh and Creag Pitridh to the east of the waterbodies.
- 1.2.3 The climb up to Loch a' Bhealaich Leamhain is over heather moorland, alongside the steep-banked, fast-flowing Allt Coire Pitridh. The terrain becomes increasingly rocky and marshy, reaching a natural saddle in the hills before dropping down to the proposed upper area of inundation beneath the imposing southern slopes of Sron Garbh.
- 1.2.4 The flat area to the south of Lochan na h-Earba includes the floodplains of the Allt Coire a'Chlachair and the Allt Coire Pitridh, and the west of the site includes the two craggy and moorland-covered hills of Binnein Shuas and Binnein Shios.

Desk-based Study

- 1.2.5 A comprehensive desk study of published data was undertaken prior to the fieldwork commencing to inform the bird surveys. The results of the desk study were used to identify if the proposed development could potentially impact upon any notable or protected species; to inform the field studies; and to provide information to guide any potential actions and priorities for any future ecological mitigation and enhancement.

Field Surveyor

- 1.2.6 All field survey work was undertaken by Mike Coleman, an experienced and competent ornithologist, Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 1.2.7 Mike has extensive ornithological field experience of both lowland and upland areas across Europe, has two decades of experience working in The Highlands, including many renewable energy projects, and holds a NatureScot Schedule 1 Licence (Number 167304).

1.3 Methodology

Desk Study

- 1.3.1 The desk study involved a search of the appropriate sources (Sitelink¹) for statutory designated sites concerning birds within a ten kilometre radius (e.g. Special Protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs), Ramsar Sites) and non-statutory designated sites (e.g. Important Bird Areas (IBAs), Local Nature Reserves (LNRs) and Sites of Importance for Nature Conservation (SINCs)).
- 1.3.2 Following an online Teams meeting with The Highland Council (THC) on 17 October 2023, historical ornithological data for Ardverikie Estate was obtained from the RSPB which has been used as background information to supplement the field study undertaken.

Field Study

- 1.3.3 The field survey consisted of four separate survey methods conducted over three visits between early-May and early-July 2023, designed to maximise records of all species, and to ensure that a full record of protected species activity was acquired through the breeding season. The breeding bird surveys consisted of three surveys conducted over the 2022 breeding season between the period from April to late-July 2022, designed to maximise records of all species. The wintering bird survey consisted of three surveys between late-October 2022 and late-February 2023.
- 1.3.4 The survey methods are described below:

Breeding Bird Survey

- 1.3.5 The breeding bird survey method was a combination of the Brown and Shepherd moorland breeding bird survey² and the British Trust for Ornithology (BTO) Breeding Bird Survey (BBS) method³. Brown and Shepherd is suitable for many moorland and open country species including waders, skuas, gulls, Red Grouse (*Lagopus lagopus scotica*) and some wildfowl species. However, NatureScot does

¹ NatureScot Sitelink: <https://sitelink.nature.scot/home> (Accessed July 2023)

² Brown A.F. & Shepherd K.B. 1993. A method for censusing upland breeding waders. *Bird Study*, 40: 3, 189-195. Or, online at <https://www.tandfonline.com/doi/pdf/10.1080/00063659309477182> (Accessed July 2023)

³ BTO Breeding Bird Survey method. <https://www.bto.org/our-science/projects/breeding-bird-survey/about-breeding-bird-survey> (Accessed July 2023)

not recommend the method for surveying moorland passerines. In early guidance, NatureScot recommended the Brown & Shepherd method, but, based on recommendations set out in Calladine et al. (2009)⁴, NatureScot prefers an adapted Brown & Shepherd method with four survey visits at least seven days apart⁵. This survey is based on a constant search method involving spending 20 - 25 minutes in each 500m x 500m quadrat, both within the survey area and a pre-determined 500m buffer zone. This equates to spending 100 minutes for every square kilometre. Each quadrat is walked to ensure that all parts are approached to within 100m. At regular intervals, the surveyor scans the area for species and also listens out for calls and songs. These should cover the whole breeding season between mid-April and late-July, and be conducted between 8:30 hours and 18:00 hours. They should be carried out in a wind of Beaufort force 4 or less, and in dry weather.

- 1.3.6 Timing of breeding varies between species and geographically across Scotland and this should be borne in mind when planning survey. Mistimed survey visits will fail to record many birds and will not be of an acceptable standard.
- 1.3.7 All survey visits should be undertaken in the same season; splitting survey visits between years is not acceptable (e.g. first visit in year 1, second visit in year 2).
- 1.3.8 Population estimates in the study area can be derived by comparing the resulting summary maps for each of the main seasonal survey periods. Registrations/territories plotted during each period are considered to be separate from one another if more than 500m apart for larger species, 200m in the case of Dunlin and passerines. These distances are chosen to reflect the distances birds could plausibly move between survey periods (following Brown & Shepherd's 1993 methodology). When compiling figures of breeding birds, the approximate central location of all registrations recorded from different visits is used to identify a notional territory centre.
- 1.3.9 The BTO survey requires visits to be spread out across the entire breeding period, with all resident and migrant breeding birds likely to be recorded during the initial two site visits, and the final visit designed to coincide with post-breeding accumulations of locally breeding species and potential early passage of species migrating south from their Arctic breeding grounds. A route through the survey area is walked at a constant steady pace. All bird species seen or heard are documented, as is any relevant behaviour (gathering nesting material, territorial calling, fighting, feeding young, etc).

Wintering Bird Survey

- 1.3.10 The wintering bird survey (WBS) visits were also based on the above BBS methods, with three visits undertaken through the non-breeding period (October to March). This survey attempted to record all overwintering species and resident species, as well as potentially recording passage birds in the late-autumn and

⁴ Calladine J, Garner G, Wenham C & Thiel A. 2009. The influence of survey frequency on population estimates of moorland breeding birds. *Bird Study*, 56:3, 381-388. Or, online at <https://www.tandfonline.com/doi/full/10.1080/00063650902984604> (Accessed July 2023)

⁵ NatureScot. 2017. Recommended bird survey methods to inform impact assessment of onshore wind farms. Version 2. Online at <https://www.nature.scot/sites/default/files/2018-06/Guidance%20Note%20-%20Recommended%20bird%20survey%20methods%20to%20inform%20impact%20assessment%20of%20onshore%20wind%20farms.pdf> (Accessed July 2023)

early-spring. A route through the survey area was walked at a slow and steady pace, and all birds encountered were documented.

Golden Eagle Monitoring

1.3.11 Golden Eagle (*Aquila chrysaetos*) is listed on Schedule 1 of the WCA 1981 in Great Britain, Northern Ireland and the Isle of Man, and Schedules A1 and 1A in Scotland. This gives year-round protection to nest sites, and monitoring guidance recommends minimum distances and times to avoid the nest to minimise disturbance of the pair or the chick⁶. To establish occupancy and the presence of a breeding pair, it is recommended that each home range is visited on at least four occasions. If time for fieldwork is limited and an observer believes a home range to be vacant on the basis of the first two visits, however, then subsequent visits can be omitted.

- Visit 1 should be to check for occupancy of the territory between January and March;
- Visit 2, in April, should locate active nests;
- Visit 3, in June is to check for young; and
- Visit 4, in July, is to check for fledged young.

Diver Monitoring

1.3.12 Recommended monitoring for Red-throated Diver (*Gavia stellata*) consists of two visits from the end of May to July, with two weeks between visits⁷; for Black-throated Diver (*Gavia arctica*), the recommendation is two visits from late-April to late-July⁸.

1.3.13 For both species, all standing water and shorelines should be checked for diver presence, and if breeding is confirmed on the first visit, no further visits would be necessary unless checking for breeding productivity, which would require a final visit from late-July to mid-August.

Black Grouse Monitoring

1.3.14 A minimum of two survey visits are required between late-March and mid-May⁹. Surveys commence one hour before dawn and conclude two hours after dawn, and comprise a search of the site for leks utilising a pre-planned transect with regular stops to listen for lekking birds and to observe the site from suitable vantage points. Where leks are encountered they should be observed from a vantage point, located at a sufficient distance to avoid disturbance, and the

⁶ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B., & Thompson, D. 2009. Raptors: A Field Guide for Surveys and Monitoring. The Stationery Office, Edinburgh.

⁷ Gilbert, G., Gibbons, D.W., & Evans, J. 1998. Bird Monitoring Methods: A Manual of Techniques for Key UK Species. Online at <https://www.rbbp.org.uk/wp-content/uploads/2020/10/Red-throated-Diver-Gilbert-et-al.pdf>

⁸ Gilbert, G., Gibbons, D.W., & Evans, J. 1998. Bird Monitoring Methods: A Manual of Techniques for Key UK Species. Online at <https://www.rbbp.org.uk/wp-content/uploads/2020/10/Black-throated-Diver-Gilbert-et-al.pdf>

⁹ Gilbert, G., Gibbons, D.W., & Evans, J. 1998. Bird Monitoring Methods: A Manual of Techniques for Key UK Species.

number of lekking males counted. Survey visits should be undertaken in dry and calm conditions, with a wind less than 3 on the Beaufort Scale.

1.3.15 The study area is illustrated in **Appendix 10.1.1**.

1.4 Fieldwork Dates

1.4.1 A programme of bird surveys was undertaken in order to identify those birds likely to be affected by the Proposed Development, and thereby inform the impact assessment process. Each round of surveys took two days, and there were three rounds of BBS between April and the end of June 2022, three rounds of WBS between October 2022 and the end of February 2023, and a second season of BBS between early May and early July 2023.

1.4.2 The field surveys during 2022 covered all habitats and species to ascertain a robust baseline for the Site. The February WBS visits and the 2023 BBS visits were more targeted, with eagle, diver and Black Grouse monitoring incorporated into the standard BBS site visits.

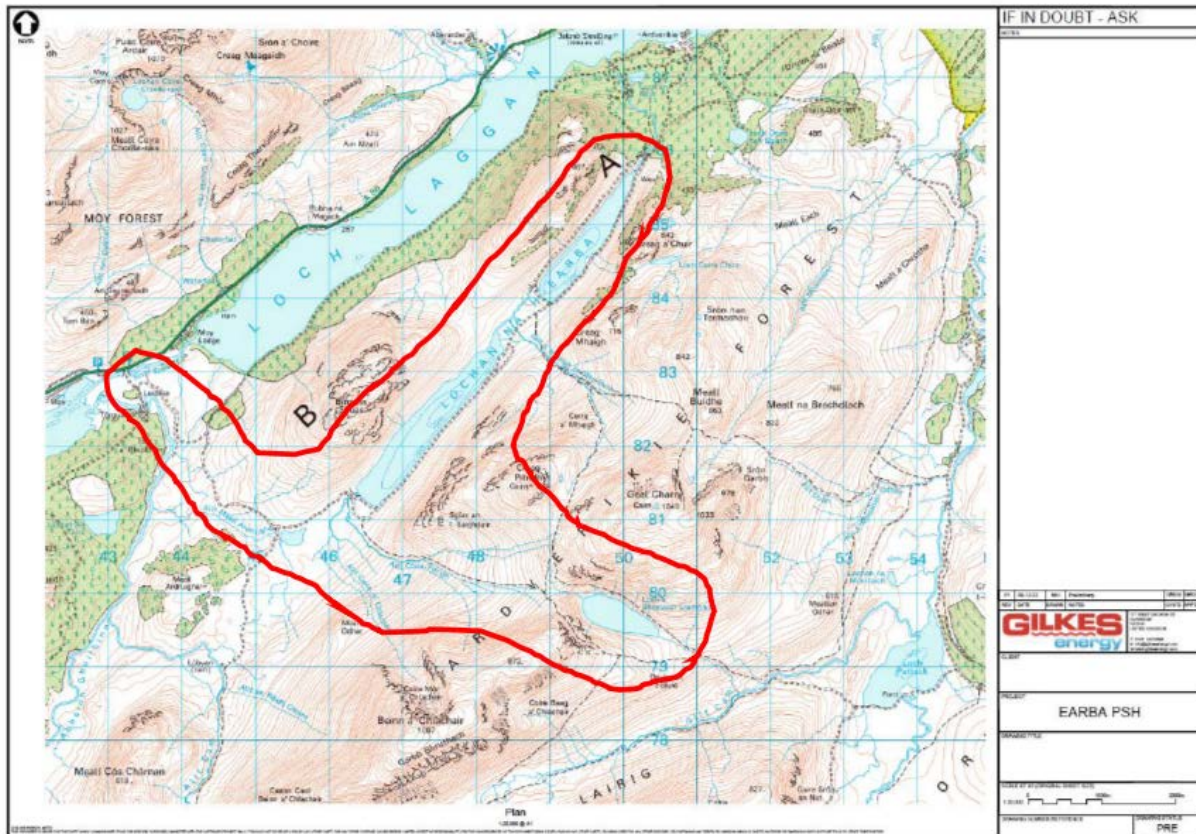
1.4.3 A summary table of all fieldwork dates and survey conditions during ornithological surveys for the Proposed Development is provided below in **Table 10.1.1**.

Table 101.1: Earba Pumped Storage Hydro Scheme Ornithology – Dates, Times and Conditions of Survey Effort

SURVEY +	DATE	SURVEY TIME	WIND DIRECTION*	WIND SPEED (/12)**	PRECIPITATION (/3)***	VISIBILITY ^x	CLOUD COVER (/8) [#]	CLOUD BASE (m) ^{##}	TEMPERATURE (°C)	GROUND CONDITIONS	SURVEYOR ^{###}
BBS	26/04/22	0830 - 1500	ENE	2	0	EXCELLENT	4 > 7	800 +	6 >10	FIRM	MC
BBS	27/04/22	0700 - 1200	0	0	0	EXCELLENT	8 >4	800 +	5 >11	FIRM	MC
BBS	30/05/22	0430 - 1100	SW	1	1	EXCELLENT	7	600	6 >10	SOFT	MC
BBS	31/05/22	0415 - 0930	NE	1 > 2	1	EXCELLENT	6	950 +	5 > 11	SOFT	MC
BBS	28/06/22	0600 - 1100	SE	4	1	GOOD > EXCELLENT	8	650	12	SOFT	MC
BBS	29/06/22	0545 - 1030	SE	3	0	EXCELLENT	7	900	13	GOOD	MC
WBS	24/10/22	0745 - 1200	SE	3	1	GOOD > EXCELLENT	8 > 5	400 > 700	9 > 12	WET	MC
WBS	25/10/22	0730 - 1130	S	3 / 4	0	EXCELLENT	3	850 +	8	WET	MC
WBS	06/12/22	0800 - 1330	E > NE	2	0	EXCELLENT	7	900	2	FROZEN / SNOW	MC
WBS	07/12/22	0800 - 1300	0 > NW	0 > 2	0	EXCELLENT	8 > 6	800 > 1000	3	SOFT	MC
WBS	27/02/23	0845 - 1330	NW	2	0	EXCELLENT	0 > 8	0 > 350	-1 > 4	FROZEN	MC
WBS	28/02/23	0645 - 1310	0 > NW	0 > 2	0	EXCELLENT	7	900	-1 > 6	FROZEN	MC
BBS	03/05/23	0520 -1145	E	1	0	EXCELLENT	7	850	6 >13	SOFT	MC
BBS	04/05/23	0630 -1130	w	4	0	EXCELLENT	8 >6	650 > 900	8 >11	GOOD	MC
BBS	06/06/23	0430 -1100	W	1	0	EXCELLENT (POOR AT TOP LOCH)	8	600	11>14	FIRM	MC
BBS	07/06/23	0645 -1200	0	0	0	EXCELLENT	5	700 +	14	FIRM	MC
BBS	03/07/23	0520 -1100	SW	2 / 3	1	EXCELLENT	6	700 +	7 > 11	WET	MC
BBS	04/07/23	0620 -1130	0 > N	0 > 1	0	EXCELLENT	7	800	9 > 12	WET	MC

LEGEND + Survey BBS=breeding bird survey, WBS=winter bird survey; * Wind Direction based on a 16 point compass direction; ** Wind Speed is based on the Beaufort Scale; *** Precipitation Scale is 0=none, 1=light showers, 2=persistent rain/heavy showers, 3=heavy rain; X Visibility scale is EXCELLENT=5km+,GOOD=2-5km,POOR=1-2km, ZERO=<1km; # Cloud Cover is based on oktas; ## Cloud Base is metres above sea level; ### Surveyor, MC=Mike Coleman.

Appendix 10.1.1 – Field Survey Area



Red line on map denotes approximate survey area during both the breeding and winter bird surveys.