

Denny to Wishaw Network Upgrade

Environmental Impact Assessment Report

Volume 3 Appendices

Appendix 8.7 - Bean Goose Advisory Group Data

May 2026



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Appendix 8.7

1.1 Introduction

This appendix accompanies Volume 1, Chapter 8 Biodiversity. It details the baseline data pertaining to Taiga bean goose *Anser fabalis fabalis* (hereafter ‘bean goose’) provided by the Bean Goose Advisory Group (BGAG).

This appendix supports and should be read in conjunction with:

- Chapter 8 – Biodiversity
- Appendix 8.6 – Ornithology Technical Appendix
- Appendix 8.8 – Habitats Regulations Appraisal

1.2 Data Background

Bean geese associated with the Slamannan Plateau Special Protection Area (SPA) have been monitored by the BGAG since 1996. The group primarily undertake monitoring on a voluntary basis and have also been involved in surveys / monitoring commissioned by NatureScot. In early years monitoring was restricted to distribution surveys by conventional survey methods while latterly Global Positioning System (GPS) technology has been used to track individual birds. Data in relation to distribution surveys and GPS tracking across the last five years (2020/21 to 2024/25) were obtained from the BGAG to inform the Environmental Impact Assessment Report (EIA Report) and Habitats Regulations Appraisal (HRA).

1.3 Methodology

Bean Goose Foraging Distribution Surveys and Data Analysis

Field count data for winters 2020/21 to 2024/25 were recorded by BGAG members using binoculars and telescopes. Checks for geese in fields on the Slamannan plateau was undertaken by car with stops at vantage points. This was either done in a non-systematic way (checking all fields visible) and covering as much of the plateau as possible, or by following flying flocks of bean geese until they started to descend to land (and then that area was checked intensively), or, more recently, contemporary GPS data were used to guide counters to fields that held a GPS-tagged goose (and then that area was checked intensively). Thus, the field checking data cannot be regarded as a systematic check of all fields on the plateau.

Counts of geese in fields (‘field counts’) were recorded in notebooks along with a unique Field ID, then entered in an Excel spreadsheet. Field count data for the winters 2020/21 to 2024/25 were combined into one spreadsheet. Data were cleaned to remove any errors / typos. A small number of field boundaries have been split (into smaller field units) over the period of study. Prior to fields being split, any counts from the original (larger) fields, have been allocated equally to the new smaller field units.

In Excel, for each winter, the number of fields which held geese was calculated using ‘Pivot Table’ reports. In addition, the mean count for each field (total number of geese counted per winter in an individual field divided by the number of occasions geese were recorded in the field) and the maximum count for each field were also calculated.

These values (for each field for each winter) were then imported into GIS, added to the Slamannan field boundary shapefile and exported as a three count metric layers.

Bean Goose GPS Tracking and Data Analysis

During the period 2020/21 to 2024/25 seven bean geese were tracked via GPS tags with a total of 35,910 fixes across this period (Table 1). Four of the birds, tagged between 2015 and 2019, were fitted with Ecotone GPS+GSM tags with the remaining three birds, tagged in 2022, fitted with Ornitela-GPS+GSM. The principal difference between the two tags is the difference in fix intervals (1 to 6 hours and 1 second to 15 minutes for the Ecotone GPS+GSM and Ornitela-GPS+GSM tags respectively) and that the Ornitela-GPS+GSM tags recorded speed (in km per hour) with each fix.

Table 1 Summary of tagged bean geese between 2020/21 and 2024/45

Tag ID	No. of Fixes	Tag Date	Sex	Tag Type	Fix Interval	Winter Period
UCOL30	446	09/10/2015	F	Ecotone-GPS+GSM	2-6hrs	20/21
WHIT182	454	24/10/2019	F	Ecotone-GPS+GSM	2-6hrs	20/21 - 21/22
WHIT242	514	24/10/2019	M	Ecotone-GPS+GSM	1-6hrs	20/21 - 21/22
WHIT27	692	24/10/2019	M	Ecotone-GPS-GSM	1-6hrs	20/21 - 22/23
215345	21359	05/11/2022	F	Ornitela-GPS+GSM	1sec-15mins	22/23 - 24/25
215346	8207	05/11/2022	F	Ornitela-GPS+GSM	1sec-15mins	22/23
215347	4238	05/11/2022	F	Ornitela-GPS+GSM	1sec-15mins	22/23*

* - Full winter period data not obtained as bird died of Avian Tuberculosis (as determined by autopsy) c.29/01/23

The GPS data from the Ecotone tags were downloaded from the 'Movebank' archive (<https://www.movebank.org/cms/movebank-main>) and the data from the three Ornitela tags were downloaded from the Ornitela web panel (<https://cpanel.glosendas.net/>). The data were clipped to the winter period according to dates of tag fitting or arrival on the plateau and dates of departure so that all data retained refers to winter movements. To exclude birds in flight (and therefore not actively utilising the area) GPS fixes with a speed of 5km per hour or greater (on the advice of the BGAG) were excluded from the data.

Bean Goose Roost Sites

The BGAG identified key roost sites based on observations during distribution surveys, analysis of tracking data and additional ad hoc roost surveys. The roost sites identified are generally waterbodies that birds have also been observed to alight on during roost counts or where droppings or other evidence of bean goose use has been substantiated later. The roost sites identified will not include all roosts used by the geese as sometimes the River Avon floods onto neighbouring fields creating suitable sites and / or the geese choose to rest and perhaps feed on fields overnight during brighter moon periods or for example if waterbody roosts are frozen.

1.4 Results

Bean Goose Foraging Distribution Surveys

The maximum number of bean goose record during surveys, as presented in BGAG Annual Reports¹, ranged from 177 to 217 between winters 2020/21 and 2024/25. Geese were

¹ Bean Goose Advisory Group (2025). Scotland's Bean Geese. Available online. <https://sites.google.com/view/scotlands-bean-geese/home>. Accessed October 2025.

recorded across a total of 59 fields during this period with numbers within years ranging from 24 to 40 fields. The distribution of these fields relative to the Site is shown on Figure 8.28(Volume 2 – Figures). The figure shows the cumulative count (i.e. number of times geese, of any number, recorded in the field) for each field across the five-year winter period. Maps for individual winter periods are provided in Volume 2, Figures 8.29 to 8.33 with abundance shown as the mean count of geese recorded within each field.

All fields are located to the south / east of the Site with only a minority of the Slamannan Plateau SPA designated area used by the geese for foraging. The distribution of foraging geese between years is shown on Volume 2, Figures 8.29 to 8.33. These figures illustrate that an area of the plateau to the southwest of Jawcraig is a core foraging area visited frequently by foraging geese between years. Outside this core area there can be significant variation in the areas favoured by foraging geese between years.

Table 2 Summary of foraging bean goose data by winter

Survey Year	Maximum Number Recorded	Number of Fields Used
2020/21	210	26
2021/22	217	40
2022/23	218	28
2023/24	177	24
2024/25	170	24

Bean Goose Roost Sites

The roost sites identified by the BGAG are shown on Volume 2, Figure 8.28. A total of ten key roost sites were identified, and GPS tracking data indicate that all roosts, apart from Avon Water Flood, were used to some degree during the period 2020/21 to 2024/25. The nearest roost site to the Site was Fannyside Moor, located approximately 900m to the southeast. Three of these roost sites, Fannyside Moor, Fannyside Loch West and Fannyside Loch East, are located within the Slamannan Plateau SPA.

Bean Goose GPS Tracking

The tracking data for each tagged bird is shown overlain with the foraging distribution data in Volume 2, Figures 8.29 to 8.33. The tracking data largely mirrors the foraging distribution data and roost sites with concentrations of fixes within fields / waterbodies identified from these surveys. In relation to the Site, two areas of use were identified from tracking data that were not picked up from the foraging or roost data. The records associated with these two areas are described below.

East of Castlecary Wood (approximately 180m north of WB Tower 33)

This area comprises a small grazing field, approximately 100m by 300m, with areas of coniferous woodland directly to the east and west. Fixes were recorded from four tagged birds as detailed below:

- Tag ID 215345 – Multiple fixes were recorded across seven days between 5 January 2025 and 1 February 2025. All records were recorded during daylight hours or within 2 / 3 hours or sundown and are therefore not indicative of an overnight roost.
- Tag WHIT182 – A single fix during daylight hours on 18 January 2022.
- Tag WHIT242 – Single fixes during daylight hours on 15, 16, 22, 23, 24 and 25 November 2021.
- Tag WHIT27 - Single fixes during daylight hours on 21, 24 and 25 November 2021.

South of the Coach House (between WB Towers 35 and 36)

This area comprises the southern end of a grazing field bordered by coniferous woodland / line of trees to the east and west with bog / heath habitat to the south. A single tagged bird (Tag 215345) was recorded in this field with multiple fixes during daylight hours on 6, 7, 8 and 10 January 2025.