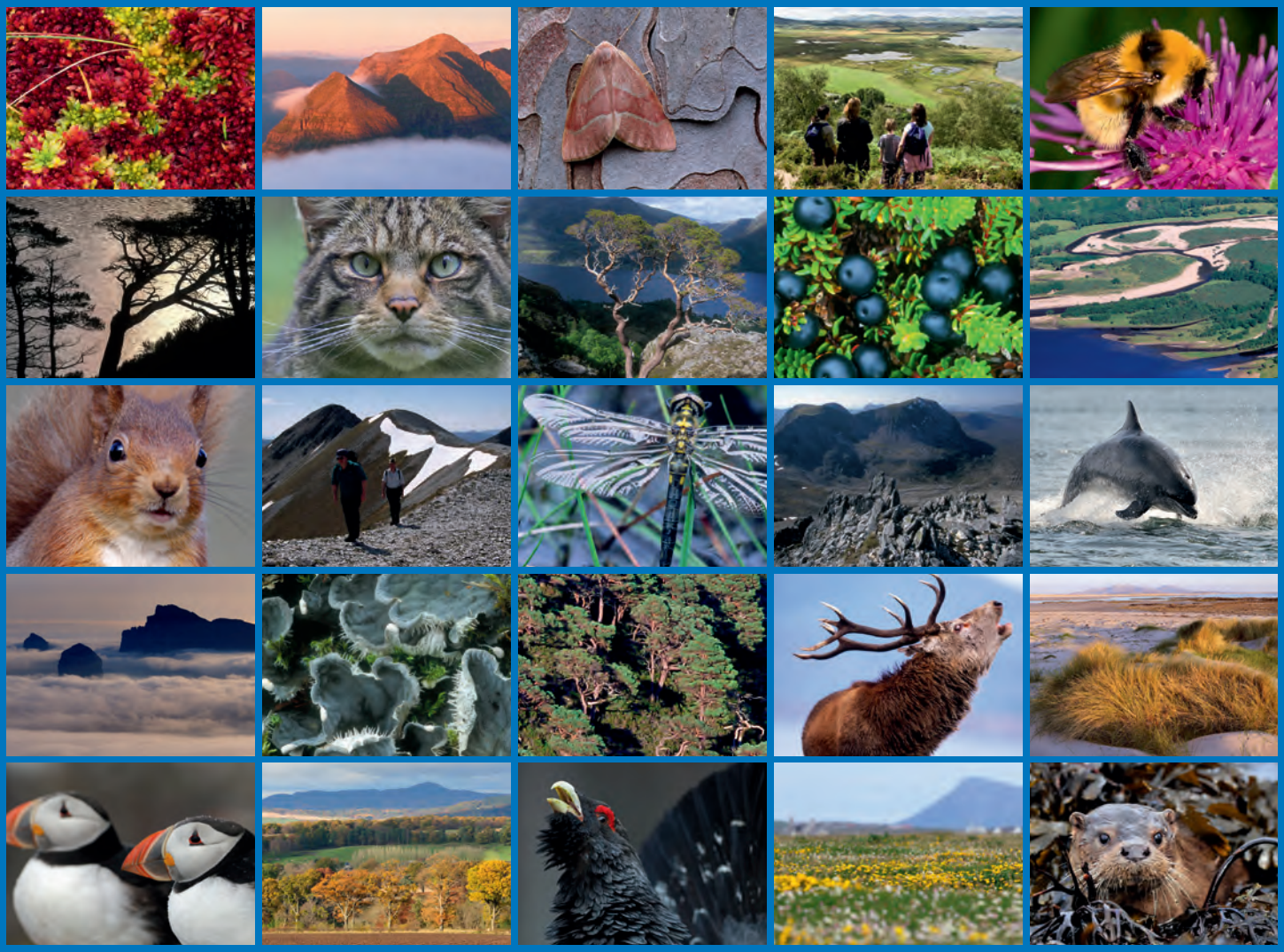
Scottish Natural Heritage
Commissioned Report No. 607

Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2011/2012



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COMMISSIONED REPORT

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Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2011/2012

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This report should be quoted as:

BCM Environmental Services Limited. 2013. Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2011/2012. *Scottish Natural Heritage Commissioned Report No. 607.*

COMMISSIONED REPORT

Summary

Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2011/2012

Commissioned Report No.: 607
Project no: 12467
Contractor: BCM Environmental Services Limited
Year of publication: 2013

Background

This report describes the results of the SNH monitoring, (*i.e.*, 1 ageing assessment and 5 roost counts), of the wintering flock of bean geese (*Anser fabalis fabalis)*, on the Slamannan Plateau area in Central Scotland undertaken between October 2011 and February 2012.

Main findings (figures in brackets relate to the comparable figures for 2010/2011):

- The ageing assessment count confirmed that 22.6% of the geese that were aged were juveniles – 30 of 133 birds, (31%);
- Prior to the roost count on the 21 December, two separate field counts of 160 and c.78 birds were obtained in rapid succession; c.238 was the peak count for the winter, (267);
- The 5 roost counts produced a mean roost count total of 126 (181); the maximum roost count was 220 (245). 4 of the 5 counts were successful; however, on one occasion, an unsuccessful roost count visit was made which resulted in a null count;
- The SNH monitoring programme therefore again provided some good representative data regarding the age structure of the flock, and its' ongoing use of the Fannyside part of the SSSI/SPA for roosting purposes;
- When allied to the BGAG monitoring the SNH-funded monitoring provides useful data; however, only the BGAG monitoring currently provides substantive data regarding which parts of the SSSI/SPA and the wider plateau are used by feeding/loafing bean geese, (although current plans for tracking some individuals using telemetry may change this); and,
- During 2011/2012 there was some evidence that a proportion of the bean goose population was roosting at Darnrig Moss for at least part of the winter, (rather than flying the greater distances involved in moving between apparently newly favoured feeding areas to the east of the B803 to the 'traditional' roost sites at Fannyside).

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Acknowledgements

Thanks are due to both Neville Makan and Christine Urquhart of SNH for their helpful comments on the draft version of this report.

Also special thanks to, in particular, Carl Mitchell, (who contributed the ageing assessment count), and to Larry Griffin of The Wildfowl and Wetlands Trust, who supplied observations relating to the Slamannan bean goose flock during the days leading up to, and following, the catching and marking of 15 bean geese on 12 October 2012.

1. INTRODUCTION

1.1 Introduction

This report has been prepared by BCM Environmental Services Limited, (BCMESL), and describes the findings of the taiga bean goose, (*Anser fabalis fabalis*) monitoring work conducted during the 2011/2012 wintering period by Angus Maciver, (AM), and Brian Minshull, (BCM).

As such, it represents the second such report, following that prepared for winter 2010/2011.[1] As described more fully in the report for 2010/2011, this work is the continuation of a long-term programme of monitoring of the use of the Slamannan Plateau by bean geese.

For the purposes of continuity, the report for 2010/2011 provided background material relating to the basis for commissioning this component of the overall monitoring effort, (*i.e.*, the monthly roost counts and an ageing assessment count commissioned by SNH, and, as such, referred to as the SNH monitoring hereafter).

Necessarily, the SNH-funded monitoring effort is complemented by other monitoring which is, in effect, part of the ongoing long-term programme of monitoring previously mentioned. Primarily, this aspect of the overall bean goose monitoring work now involves supplementary roost counts and field counts. For convenience, this element of the overall monitoring of the Slamannan Plateau bean goose population is referred to as the Bean Goose Action Group,[2] (BGAG), monitoring.[3] Further, this work is largely conducted on behalf of the BGAG by the same individual who undertakes much of the SNH-funded monitoring, namely AM, to the same standards. Further, there is often considerable overlap between the two; and as such, where necessary, this report makes reference to this.

The monitoring work described in this report was undertaken between 20 September 2011, when the Slamannan Plateau population of bean geese first began to arrive on their favoured wintering grounds from the breeding area, and *c.*18 February 2012,[4] the estimated date of the final departure of birds back to their breeding grounds, (these dates were determined on the basis of evidence provided by the BGAG monitoring visits).

Therefore, should further information be required relating to the wider monitoring effort, (both as conducted in winters preceding 2010/2011, when the SNH monitoring commenced, and as completed concurrently alongside the SNH monitoring described in this report and the report for winter 2010/2011), the preceding report should be referred to.

1.2 SNH monitoring effort – winter 2010/2011 onwards

The SNH-funded monitoring effort necessitates:

- monitoring abundance through five monthly roost counts; and,
- age assessments of the flock through one field observation.

[1] BCM Environmental Services Limited. 2011. Report on the Delivery of a Monitoring Programme for Bean Goose on the Slamannan Plateau 2010/2011. *Scottish Natural Heritage Commissioned Report No. 487.*

[2] The Bean Goose Action Group is described more fully in the previous report.

[3] In the previous report the SNH monitoring work was referred to as the formal monitoring effort, and the BGAG monitoring effort was referred to as the informal monitoring effort; these terms have been replaced as they were considered ambiguous.

[4] There was a subsequent record of 120 bean geese at Parkhead Farm on the 25 February 2012, (see Annex B), but there is no independent confirmation that this record definitely related to bean geese.

In August 2011, SNH commissioned BCMESL to undertake monitoring in 2011/2012, (and, in addition, to undertake the same in 2012/2013 and 2013/2014).

BCMESL was previously commissioned to undertake the same work in winter 2010/2011, and as such successfully implemented the new monitoring programme during the first wintering season in which the newly re-devised SNH monitoring approaches were used.

1.3 BGAG monitoring effort – 2011/2012

As was noted in Section 1.1, the monitoring programme implemented in previous years in effect continues, albeit on a slightly curtailed basis. In principle however, the same approaches are still used and therefore this monitoring produces broadly comparable data to that obtained prior to 2010/2011.

This is of particular relevance here, as the findings of the BGAG monitoring effort, in effect, complement and supplement those of the SNH monitoring effort, and vice versa. For example, these counts, (whether field counts or roost counts), made on broadly consecutive days will often substantiate the overall number of birds present.

Indeed, the importance of at least cross-referencing the BGAG monitoring report, (and if possible relevant data), in the SNH monitoring report, and *vice versa* was emphasised in the corresponding report for winter 2010/2011 and will be again be applied where appropriate in this report.

1.4 Relevant BCMESL experience

In addition to undertaking this work in the preceding winter, BCMESL has relevant experience in relation to the monitoring work required. This is fully described in the report covering winter 2010/2011. Further, AM has a wealth of highly relevant experience, having monitored the Slamannan Plateau Bean Goose population for many years.

2. EXPLANATION OF SURVEY VISIT APPROACHES

As detailed in the report for 2010/2011, (and in Section 1.2 of this report), the work involved requires:

1. One age assessment count of the flock through field observation; and,
2. Five monthly roost counts aimed at monitoring abundance, as follows:

- 1st visit during October;
- 2nd visit during November;
- 3rd visit during December;
- 4th visit during January; and,
- 5th visit during February.

As before, the actual visit days were planned, (and changed), so that they were undertaken when weather conditions and other factors were considered to be suitable for the visit.

The following provides cross-references to the relevant sections of the corresponding report for winter 2010/2011, which fully describes the intended approaches to the ageing assessment count and the roost counts as proposed and used for the SNH monitoring.

- Ageing Assessment Count – refer to Section 2.2 of the 2010/2011 report; and,
- Roost Counts – refer to Section 2.3 of the 2010/2011 report.

In general, the approaches used in 2010/2011 were again adhered to during 2011/2012.

The findings of the ageing assessment count and roost counts completed in 2011/2012 are summarised in Tables 3.1 and 3.2. Further, these visits are described in full in Annex A; where the approaches used in 2010/2012 differed slightly from those described in the 2010/2011 report this is described in the tables provided in Annex A.

3. DESCRIPTION OF RESULTS OF 2011/2012 SURVEY VISITS

Table 3.1, (Summary of Bean Goose observations – Ageing Assessment Count), provides summary details of the ageing assessment count, and Table 3.2, (Summary of Bean Goose observations – Roost Counts), provides summary details of the five roost counts. Subsequent parts of this section describe these findings in more detail.

Annex A: (Details of Bean Goose Counts) includes further tables which provide more details of the bean goose counts undertaken in winter 2011/2012; for maximum utility these tables include, (where applicable):

1. Date and time of observations;
2. Details of any counts made shortly before the actual count;
3. Details of the actual count;
4. Any additional information, (observers, *etc*.); and,
5. Details of the weather preceding and during the survey visit, *etc*.

Tables 3.1 and 3.2 concentrate on summarising the key data recorded during the survey visits, whilst those in Annex A provide full details of these visits.

Subsequent sections of this report examine what this data indicates and make some tentative conclusions and recommendations regarding the same.

Table 3.1. Summary of bean goose observations – ageing assessment count

Date	Number of birds aged and number of juveniles aged (%)
10 October 2011	Number of birds aged – 133, of which 30, (22.6%), were juveniles

Table 3.2. Summary of bean goose observations – roost counts

Date	Roost count totals recorded (estimated number of birds)	
26 October 2011	Birds counted	*c*.220
23 November 2011	Birds counted	*c*.78
21 December 2011	Birds counted	160
25 January 2012	Birds counted	0
15 February 2012	Birds counted	*c*.170
	Average of roost count totals recorded (rounded up)	126

4. DISCUSSION OF RESULTS OF 2011/2012 SURVEY VISITS

4.1 Introduction

This section discusses the findings of the 2011/2012 SNH monitoring, as summarised in the preceding section and detailed in Annex A. Also, as previously indicated, where appropriate, this section compares the data obtained with that available from other sources, notably that provided by the BGAG monitoring also conducted by AM.

4.2 Ageing assessment count

On the 10 October, during efforts to catch bean geese for marking purposes using cannon-netting, an ageing assessment count was conducted by Carl Mitchell, (Principal Research Officer – Waterbird Monitoring), of the WWT. Concurrently, 233 bean geese were counted in the Luckenburn fields, partly by Larry Griffin, also of the WWT, and by BCM. 133 of these birds were aged, and 30 were aged as juveniles; that is 22.6% of those aged were juveniles, (compared to a proportion of 31% in autumn 2010, the highest ever recorded on the Slamannan Plateau)[5]. After the 10 October, the flock size remained virtually the same, (the peak count for the winter was *c*.238), and so this ageing estimate can be considered to be representative of the 2011/2012 winter flock.

Although low in comparison to the apparently high rates of productivity achieved by the population of bean geese wintering on the Slamannan Plateau in 2010/2011 as a result of the 2010 breeding season, the proportion of juveniles of 22.6% recorded in autumn 2011 compares reasonably well to that recorded in some other recent years. For example, in 2007, 25.2% of 103 aged birds were considered to be juvenile.

Finally, it is also noted that the birds marked with neck-collars in autumn 2011 included several pairs / family groups, and monitoring in winter 2011/2012, (and in future winters), will also reveal more details relating to productivity and breeding biology.

4.3 Roost counts

As detailed in Section 3, five roost counts were completed during winter 2011/2012.

Each of these counts is discussed individually and then collectively below.

Where relevant, counts made as part of the BGAG monitoring are referenced to provide further background.

4.3.1 October roost count

The roost count of *c*.220 made on the 26 October was considered to be representative of what was the known wintering population size at that stage of the wintering period. For example, during field counts made as part of the BGAG monitoring on the 10/11/12 October counts of 233, 227 and 233 birds were made whilst on the 6 November 215 birds was made. These counts were all undertaken at Luckenburn.

However, it should be noted that the roost count of *c*.220 was partly based on supposition, as, typically, the bean geese came into roost some ¾ of an hour after sunset. By this time it was almost completely dark, and this combined with the suddenness and somewhat confused nature of the arrival made it difficult to record a definite count total, or precisely where all the birds roosted.

[5] Goose News - The newsletter of the Goose & Swan Monitoring Programme Issue no. 10, Autumn 2011 WWT, JNCC and SNH monitoring.wwt.org.uk/pdf/GooseNews10.pdf

During the day some sightings of birds were made as part of a co-ordinated search for birds which had recently been fitted with neck-collars. Although some birds were found, the majority of birds were not located during the day. As the birds later came in from the north, it was surmised that they had probably been feeding in fields around Bandominie Farm. Although a few birds wheeled around and alighted in the vicinity of the Fannyside Muir pools or perhaps also nearby on the muir itself, the majority of the birds alighted on East Fannyside Loch. During the next couple of hours counts of *c.*130 birds were successfully made from the area immediately east of the loch. During this time there was evidence of some local inter-change of birds between the various roost areas. Besides being visible on the loch the birds remained very audible at times.

4.3.2 November roost count

A total of *c.*76 bean geese were seen as they came in to roost on the 23 November. They came in from the east or north-east in two groups which passed to the north of BCM who was positioned at the bend in the Garbethill road. It was assumed that these birds roosted on Fannyside Muir. No other incoming groups were recorded in less than ideal conditions.

Therefore, on this occasion, the number of birds actually recording coming into roost had little similarity with either the flock size that had been counted in the preceding weeks, (when a maxima of 233 had been recorded), or perhaps with what had been recorded earlier that same day when *c.*78 bean geese were counted in field 255 of the Hillend fields and 18 were counted in field 92, (and earlier that day flocks of 88 and 18 respectively had been seen in the same fields). Certainly flock sizes corresponding to those observed earlier in the day were not recorded, (unless the flock of *c.*78 had sub-divided into two smaller groups), and further, both the incoming flocks seemed to come in from a different direction than would have been expected for the birds seen earlier in the day. Further, a flock of 174 was recorded during field counts on the 1 December.

This roost count therefore exemplifies the potential difficulties of achieving representative counts at this time of year; the known wintering flock size recorded earlier in the wintering period was now comprised of a series of smaller sub-flocks, the weather conditions were very unhelpful for recording purposes, and again the birds came in some ¾ of an hour after sunset.

Therefore the count total given should not be considered as representative of the numbers of bean geese present on the plateau at this time.

4.3.3 December roost count

A flock made up of what was considered to be *c.*160 bean geese came in to roost on the 21 December. These birds came in from the east and passed almost directly overhead in relation to Stuart Green, (SRG), (who was with BCM on this occasion), and BCM who were positioned at the bend in the Garbethill road. They roosted on Fannyside Muir. No other incoming groups were recorded in less than ideal conditions.

Earlier in the day of this roost count AM had located and counted a flock of 160 bean geese in field 275. He had then advised BCM of these details. Consequently, later in the day SRG and BCM also counted 160 bean geese in field 275, (and were also able to record the details of several birds in this flock with neck-collars). Whilst BCM and SRG were watching this flock, AM again contacted BCM and informed him that bean geese had recently been reported in fields to the east of the B803, (part of the Plateau deserted many years ago by the bean geese flock), and so BCM and SRG investigated this. They successfully located *c.*78 bean geese in field 166. As this count was made soon after the count of 160 in field 275 this produced a total number of *c.*238 bean geese, a figure which constituted the peak

count recorded during winter 2011/2012[6]. Thus, the peak flock size recorded this winter involved the summed total of two separate flocks for which accurate or reasonably accurate counts were made. These counts were made within a short period of time at two different locations on the plateau. More typically, the winter maxima, (the peak count), is usually achieved as a result of a count made at Luckenburn, (where the birds are relatively easy to count), during the autumn, (and at a time after most birds have arrived, but before the flock becomes sub-divided into two or more sub-flocks which have moved to locations where they cannot be as readily located or counted).

As it appeared that the *c.*78 birds seen in field 166 did not roost at the Fannyside sites that night AM later speculated that they may well have roosted elsewhere, possibly in association with the Avon Valley pink-footed geese flock, (which often roosts on Darnrig Moss), or even on Loch Elrig, (where the bean geese formerly roosted). Further, it was decided that this should be investigated during future visits, including the roost count to be completed in January as part of the SNH monitoring, (see sub-section 4.3.4 below).

As such, the December roost count was very representative of that part of the bean goose population that was feeding in areas to the west of the B803 in mid-winter 2011/2012; however, at this time an additional 80 or so birds were feeding and roosting elsewhere.

4.3.4 January roost count

As part of the ongoing BGAG monitoring AM successfully recorded bean geese roosting at Darnrig Moss after the sub-flock of some 80 birds had been located to the east of the B803 on the 21 December.

For this reason, a co-ordinated count of both this site and the 'traditional' Fannyside sites was conducted on the 25 January; AM visited the Darnrig Moss area, and BCM visited the Fannyside Muir area.

In the days preceding the roost count the geese had proved elusive, and although during BGAG monitoring they had been seen to arrive at the Fannyside Muir roost from the Bandominie area a few days before the count, and 46 had been seen in fields at Wester Lochgreen on the day itself, there was no definitive indication of where the majority of the birds were feeding, (and at which roost they would be arriving and from which direction).

AM recorded no geese coming in to Darnrig Moss.

Sometime after the 'typical' arrival time BCM eventually became aware of geese skeins arriving from the north or north-east in the distance as they alighted on, or moved around over, Fannyside Muir itself, (rather than the pools on the muir invariably used), some 500 m away from where BCM was positioned at the bend in the Garbethill road.

This activity involved several hundred geese, but due to a strong wind and the distances involved it was not possible to specifically identify them, (*e.g.*, no calls could be discerned); although bean geese were undoubtedly in the flocks observed, pink-footed geese and greylag geese, (which had also been seen in the area to the north in the past month), were also undoubtedly involved. As such no count of bean geese could be recorded.

[6] The BGAG monitoring report for 2010/2011 uses the expression 'the highest count for the wintering period' when referring to the peak count recorded in that winter. Where applicable, the SNH monitoring reports will use the term peak count to indicate the same.

(As part of the BGAG monitoring AM recorded a roost count of 170 bean geese on the 20 January and this was broadly representative of the numbers of birds using those parts of the plateau to the west of the B803 at this time).

4.3.5 February roost count

It was not possible to simultaneously undertake roost counts at both Darnrig Moss and Fannyside Muir in February. However, (despite, again, the confusing arrival of three species of geese well after dusk), the roost count of *c.*170 bean geese which roosted on Fannyside Muir which was made by AM on the 15 February was considered to be representative of what was the known wintering population size at that stage of the winter. For example, earlier that day, during the BGAG monitoring, AM recorded three distinct sub-flocks of bean geese; these involved 10 birds in field 166, (to the east of the B803), plus *c.*164 birds in fields closer to the Fannyside roost sites. At least 60 pink-footed geese and 100 greylag geese also roosted at Fannyside on this occasion.

4.3.6 All roost counts

Overall, the five roost counts produced data of a representative quality, (compared to the BGAG monitoring effort, and the monitoring that was undertaken in previous years). As in 2010/2011, four of the five counts were successful in terms of producing an estimate of the numbers of birds roosting in the Fannyside area on the night the roost count visit occurred. Further, in the remaining instance, it is highly likely that bean geese arrived to roost at Fannyside during the roost count visit but this could not be categorically confirmed. As described in the preceding SNH monitoring report, this scenario was anticipated; although the visit dates/times were broadly selected in advance and fine-tuned to take into account factors such as weather, *etc*., it was realised, on the basis of prior experience, some visits could coincide with nights when the birds opted not to use the Fannyside roosts, (or, as in this instance, could not be specifically identified or counted for some reason).

Again, this re-emphasises the importance of carefully recording the prevailing weather conditions and other extenuating circumstances on each and every monitoring visit; such data is essential in terms of improving the understanding of when and why the geese chose to use the roost area or specific parts of it, (*i.e*., why they chose not to use the roost area at all on some occasions, and why they chose to use either West Fannyside Loch, East Fannyside Loch or Fannyside Muir is only partially understood).

In comparison to winter 2010/2011, winter 2011/2012 was relatively mild, with very little snow and ice. The five roost counts produced an average count of 126, (*i.e*., 220 + 78 + 160 + 0 + 245 = 703/5). The standard deviation for all 5 roost count visits is 86.75, which reflects skewed sample caused by the null count. Conversely, if the null count is disregarded, the successful roost count visits produced an average count of 157, for which the standard deviation is 58.84. As noted in the report for 2010/2011, this demonstrates, if nothing else, the importance, in terms of any subsequent statistical analysis, of achieving successful roost count visits.

Table 4.1, compares the roost count totals obtained in 2010/2011 with those obtained during winter 2011/2012. As suggested, the factors influencing the numbers of birds attending the roost sites each night, (as well as those affecting the recording of the same), are very complex, and further, winter 2011/2012 proved to be very different to the preceding one.

Table 4.1. Comparison of 2010/2011 and 2011/2012 Roost Counts

2010/2011 Dates	Roost count totals	2011/2012 Dates	Roost count totals
28 October 2010	225	26 October 2011	*c*.220
24 November 2010	236	23 November 2011	*c*.78
22 December 2010	0	21 December 2011	160
20 January 2011	200	25 January 2012	0
16 February 2011	245	15 February 2012	*c*.170
Average (rounded up)	181	Average (rounded up)	126

Therefore, any comparison of roost count totals between one winter and the next is not valid, despite the broad similarity of dates involved. However, the recorded roost count totals in winter 2011/2012 were lower than those recorded in the preceding winter.

No dawn roost counts were completed as part of the SNH monitoring during winter 2011/2012; further, it was generally confirmed that geese arriving at the roost sites did so some ¾ of an hour or more after sunset.

As was detailed in the preceding SNH monitoring report, it is useful to consider the roost counts made during the SNH monitoring in the context of the field counts and roost counts made as part of the BGAG monitoring, (and also in the context of any field counts made before the roost counts made as part of the SNH monitoring). For example, as suggested in the report 2010/2011, for the reasons outlined, if the January roost count was conducted and reported in isolation, (without the knowledge gained during other, previous and concurrent, BGAG visits to the plateau), this report could potentially include a null count, (or even a series of null counts), without any explanation.

The following section discusses in more detail how the findings of the SNH monitoring effort relate to those of the BGAG one, and *vice versa*, and discusses what the findings of the SNH monitoring programme can be used to indicate, and, perhaps even more importantly, what they can't.

4.4 Findings in the context of the BGAG monitoring data

Figure 4.1, illustrates data gathered during SNH roost counts, (red columns), compared to those gathered from all BGAG monitoring, (*i*.*e*., field and roost), counts, (blue columns).

All five SNH roost counts can be seen, (although that for January is evident only as a small red dot denoted 0). The BGAG counts, (whether relating to feeding flocks located during the day, or to roosting flocks recorded in the Fannyside roost area close to dawn or dusk), are obviously much more numerous, but are, broadly, in a similar range, (taking into consideration that not all of the birds might be recorded during the day, as once the flock begins to break up after the feeding almost exclusively in the Luckenburn fields for the first few weeks of the wintering period, not all sub-flocks, (or indeed no birds at all), might be

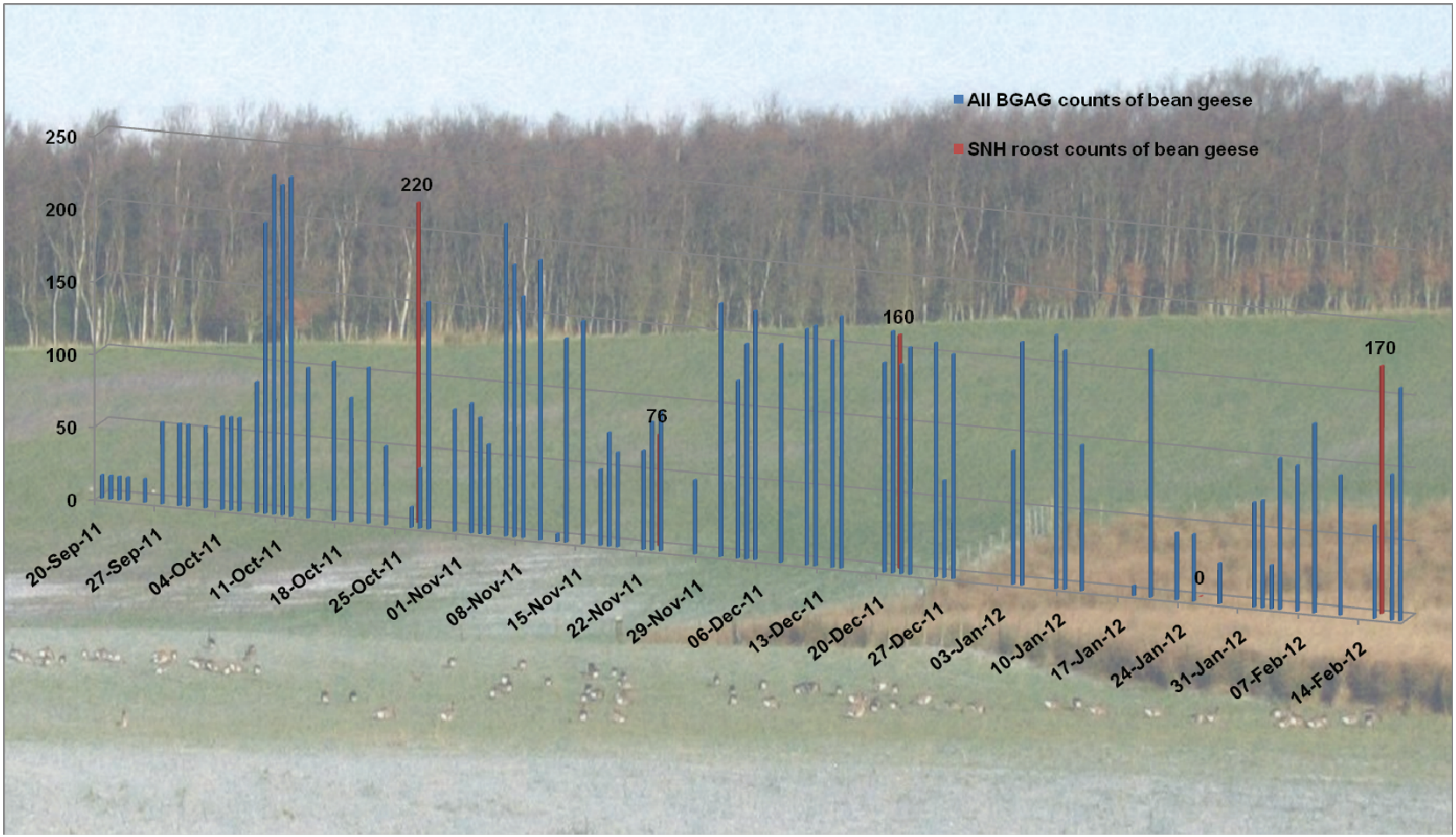

Figure 4.1. Graph illustrating data gathered during SNH roost counts compared to that gathered from all BGAG counts

Note: the January roost count returned a null count and as such does not appear as a red column.

located on some visits, especially when birds are using feeding areas that are not accessible / viewable). Conversely, a good roost count might involve counting or estimating 'all' of the bean geese present on the plateau as they arrive or leave the roost area, (hence the October and February roost counts completed as part of the SNH monitoring producing totals in excess of the BGAG monitoring counts conducted at similar times).

In addition to showing the variation in count totals achieved on the many BGAG and few SNH visits to the roost and/or plateau that were completed throughout the winter, (both in terms of variation of the number of birds successfully located and counted and/or estimated, and also, possibly, in terms of actual changes in the number of birds present of the Plateau), the graph also demonstrates the:

- Large difference in survey effort deployed in terms of the BGAG survey effort compared to the SNH one, both overall, and indeed, each month;

- Roost counts in November and December which were comparable with field counts at this time, possibly reflecting the fact that some of the flock was roosting, and indeed feeding, elsewhere, (and as such was often not located / counted during the field and roost counts); conversely that for October reflects the fact that by this time the flock had begun to break up into smaller flocks, (producing relatively low field count totals at this time), whilst 220, (not dissimilar to the peak count of *c.*233 obtained a couple of weeks before), were counted at the roost sites on the 26 October;

- Series of good counts achieved, (at Luckenburn), in mid-October, reflecting not just the relative ease of obtaining counts at this time and at this place, but also the increased field effort during the work aimed at catching and marking bean geese involved the WWT;

- Relative paucity of any counts in January when the birds could not readily located on the plateau; and,

- That the peak count of *c.*238 obtained in December is not evident in the graph as it was derived from two separate field counts; this and other such high counts made on any one day are not evident as the BGAG monitoring concentrates on providing counts for readily identifiable geographical features, (mainly individual 'fields', but also various muirs and the Fannyside lochs, for instance), and as such each individual count is represented by one column as these are not summed. This peak count is less than the highest count total of 267 achieved in 2010/2011.

As was noted in the preceding report, it is important to emphasise that the SNH monitoring does provide useful data relating to an ageing assessment count and five roost counts, (*i.e.*, counts indicating how productive the preceding breeding season was, and how many birds are using the Fannyside roosts on five occasions during the winter), as it doesn't necessarily provide any information relating the wider use of the plateau, (and therefore for much of the Slamannan Plateau SSSI/SPA), beyond this localised area within the designated site. This issue is discussed more fully in the preceding report, but is re-emphasised here, not least because in winter 2011/2012 there was good evidence that the Slamannan Plateau bean geese were using two separate roost sites each night.

As a result, where the birds are when not roosting at the Fannyside Lochs and/or Muir and when they are feeding is only known due to the BGAG monitoring effort. This component of the overall monitoring effort is therefore crucial in terms of understanding which fields on the

plateau, (and within the areas designated as the Slamannan Plateau SSSI/SPA), are being used each winter, (and therefore, potentially, how this may change in the future).

For example, It has been apparent in the last couple of winters that there has been a shift in favoured feeding areas of the bean geese since the establishment of the SSSI/SPA; this was devised on the basis of good evidence of preferred feeding areas in the 2000/2001 – 2004/2005 period, and given that the favoured feeding areas, (and therefore the designated areas), are mainly improved farmland, circumstances change. As a result, the 'match' between the favoured feeding areas used in winters 2010/2011 and 2011/2012 and the SSSI/SPA hasn't been as complete or accurate. Further, the monitoring conducted in 2011/2012 revealed that, for the first time since the 1980s or 1990s, at least some of the population of bean geese wintering on the Slamannan Plateau was regularly feeding in fields to the east of the B803 during part of the winter, and further, this sub-flock was probably roosting at Darnrig Moss at this time. These areas are at least 3 km beyond the boundaries of the Slamannan Plateau SSSI/SPA, (although it should be noted that Darnrig Moss is also designated as a SSSI).

Finally, the BGAG monitoring effort also provides other important information relating to the status of bean geese on the plateau, including, for example, the dates the wintering population arrive and leave, any records of other goose species such as greylag geese and pink-footed geese on the plateau, (unless such records were made during the SNH roost counts), and disturbance.

4.5 Other data

In addition to the data available as a result of the BGAG monitoring effort, data relating to the Slamannan Plateau bean goose population are available from readily available resources such as specialist e-groups and websites. Although such information must be used with caution, this information is still potentially useful.

Annex B: Other Data - Rare Bird Alert Reports of Taiga Bean Geese on the Slamannan Plateau during Winter 2011/2012, provides information from the Rare Bird Alert website for winter 2011/2012.

Despite an influx of certain species of geese, (including many tundra bean geese, and also at least a few correctly identified taiga bean geese), during in winter 2011/2012, (and therefore much elevated, and often confused, levels of reporting of bean geese due to the difficulty of sub-specific identification), the number of reports of bean geese to RBA during winter 2011/2012 was much reduced compared to that in the preceding winter. AM and BCM rarely, if ever, report the sightings made during the BGAG and SNH monitoring, although the sightings of the two flocks that constituted the peak count on the 21 December 2011 are evident in Annex B.

The comparative paucity of records detailed on RBA during winter 2011/2012 possibly relates to a reduction in reporting of bean geese by birders engaged on surveys being undertaken on the plateau in relation to various development proposals.

Most of the records on the RBA website for winter 2011/2012 are largely confirmatory; so, for example, the records at Luckenburn in the early part of the winter are similar to those counts obtained in this area at this time as part of the BGAG monitoring. Similarly the records in mid-winter in the Hillend Farm area are also similar to those obtained there during the same part of the winter, (and both probably relate to reports made by birders visiting the plateau over the holiday period).

Two records are somewhat interesting as they are out of range, (*i.e.*, from a location away from the plateau), and/or out of 'time', (*i.e.*, outside the period bean geese were recorded as being on the plateau as defined by BGAG monitoring), respectively. However, as there is no independent confirmation of these records no great credence should be given to them; for example, although the record of 150 bean geese at Kirkintilloch is intriguing, there was no subsequent report from this location.

5. CONCLUSIONS AND RECOMMENDATIONS

The monitoring work described in this report is, a continuation of field research which started in January 1990, as presented in a series of annual reports, (see the corresponding report for 2010/2011 for full details of these reports). This report provides details of the findings of the 2011/2012 SNH monitoring which was, necessarily, conducted in conjunction with the BGAG monitoring. One age assessment count of the flock through field observation and five monthly roost counts were made.

The report for winter 2010/2011 described the current SNH and the previous and concurrent BGAG bean goose monitoring efforts in some detail. It also indicated the actual approaches used during the survey visits.

This report concentrates on providing a description of the results obtained during the 2011/2012 winter; it also provides some discussion of the same. This section attempts to summarise the key conclusions and recommendations relating to these results.

The findings of the SNH monitoring are complemented by those of the BGAG monitoring. That is, in isolation, the SNH monitoring has somewhat limited value, but this value is greatly increased if the findings of both the BGAG and the SNH monitoring are used in close conjunction.

As an example of this, the peak count obtained during the roost counts *per se* was 220. However, the peak count during winter 2011/2012 was *c*.238, (a total which was established due to the combined efforts of AM, BCM and SRG prior to the December roost count completed as part of the SNH monitoring). If the SNH monitoring was the only such work being undertaken, the assumed peak count in winter 2011/2012 would be 220, which is 18 birds fewer than the peak count recorded during all monitoring work, (or only 92.44% of the 'actual' total).

The SNH monitoring provides limited information relating to two very specific aspects of the Slamannan Plateau bean goose population each winter that is:

- What proportion of the newly arrived wintering flock is comprised of juveniles; and,
- An indication of how many bean geese are roosting at the main roost sites on 5 nights.

The BGAG monitoring provides invaluable information relating to where at least some of the geese are on the plateau, (and in what numbers), on *c*.80, (in the instance of 2011/2012), days during the winter, (whether these area are inside or outside the SSSI/SPA). It also provides a range of other useful information relating to the dates the wintering population arrives and leaves, any records of other goose species and disturbance.

The two different monitoring programmes provide a wealth of information about the Slamannan Plateau bean goose population, and will continue to do so, especially when allied to the new initiatives which have already resulted in the individual marking with neck-collars, (and fitting with telemetry devices), of 4 individual bean geese.

Therefore, in this context, it is considered that the SNH monitoring provides representative data in relation to the wintering population size and structure of bean geese on the Slamannan Plateau.

The efficacy of the ageing assessment counts compared to those made previously is considered to be very high. Therefore, it is recommended that this count should be continued using this same approach, and wherever practicable it should continue to be

made in conjunction with the WWT personnel if at all possible, whilst acknowledging that it is important that such counts are undertaken by AM.

In terms of the efficacy of SNH monitoring roost counts, the situation is less straightforward. The peak count for the winter was *c*.238 birds; whereas the maximum roost achieved was 220 birds. Again, as in the previous winter, the number of birds counted, (or estimated), during some of the roost counts was in part informed by sightings of bean geese earlier that day, (*e*.*g*., as with the December roost count). As has been demonstrated both this winter and last, if roost counts alone were relied on this could potentially only provide less than 5 counts each winter, some of which might only be rough estimates, as the circumstances on each roost count visit varies in terms of weather, *etc*., and with it the accuracy of the count obtained, if indeed birds are recorded.

The BGAG monitoring remains crucial to any understanding of how the bean geese are currently utilising the plateau, which is, (as any natural phenomena), a dynamic situation.

Given the sensitivity of designating parts, (including productive agricultural areas), of the plateau for geese it is imperative that a good understanding of this situation is maintained. As has been suggested, the use of tracking devices will greatly facilitate this, but until this is successfully achieved, this information is only provided by the BGAG monitoring. As was suggested in the corresponding report for winter 2010/2011, the marking and/or tracking studies, which commenced in October 2011, (and which will be continued), have already started to provide more information about the Slamannan Plateau population of bean geese, and will ultimately provide much more information about the origins and movements of these geese when they are not on the plateau, as well as potentially providing invaluable data about their movements within it during the wintering period.

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In addition, the report for winter 2010/2011 provides a comprehensive list of the various annual bean goose monitoring reports, and should be referred to for confirmation of the full details of these reports which describe the monitoring effort in winters before 2010/2011.

ANNEX A: DETAILS OF BEAN GOOSE COUNTS

A.1, Ageing Assessment Count

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19 October 2011 – pm – Ageing Assessment Count – Survey Activities and Observations

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233 bean geese were counted in the late afternoon in the Luckenburn fields. Of these 133 were aged, and these included 30 juveniles, (*c*. 23%). This ageing count was conducted Carl Mitchell, Principal Research Officer – Waterbird Monitoring, Wildfowl and Wetlands Trust, although Larry Griffin, (also of the WWT), and BCM also contributed to the count of the total flock size.

The prevailing weather conditions were reasonable for an ageing count, although it was rather dull.

(AM also conducted an ageing count on the 10 October. 85 bean geese were counted in the late morning in the Luckenburn fields. Of these, 60 were aged, and these included 11 juveniles, (*c*.18%)).

Both of these counts are included here to demonstrate the range of variability involved, (due to the difficulty of ageing at least some birds but also due to differing breeding success rates of different pairs / clans. As the one carried out by CM was the large sample it is perhaps more representative of the total flock present on the Plateau at this time.

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26 October 2011 – pm – October Roost Count – Survey Activities and Observations — Roost count total: *c*.220 birds counted

During the day, some sightings of birds were made as part of a co-ordinated search for the recently neck-collared birds. For example, 14 bean geese were observed in the late afternoon in field 92, (2 with neck collars), and a small flock was also recorded in the Luckenburn fields. However, the majority of birds were not located during the day. As the birds later came in from the direction of Bandominie Farm, to the north, it was surmised, (on the basis of the direction they came in from), that they had probably been feeding in fields there.

At 18.36 what was estimated to be some 220 birds came in to roost. This was observed by AM and BCM, (and also Carl Mitchell and Larry Griffin), from the entrance to the former peat works on Fannyside Muir. By this time it was almost completely dark, and this combined with the suddenness and somewhat confused nature of the arrival made it difficult to record a definite count total, or precisely where all the birds roosted. However, although a few birds wheeled around and alighted in the vicinity of the Fannyside Muir pools or perhaps also nearby on the muir itself, the majority of the birds alighted on East Fannyside Loch. Certainly during the next couple of hours as attempts were made to get close enough to birds with GPS neck collars for the data within these to be downloaded, good numbers of birds were evident on the loch from Fannyside Toll, and indeed counts of *c*.130 birds were successfully made from the area immediately east of the loch. During this time there was evidence of some local inter-change of birds between the various Fannyside roost areas. Besides being visible on the loch the birds remained very audible at times. A skein of pink-footed geese were also heard and seen as they flew over Fannyside Muir / Loch in the dark.

The weather was reasonable although earlier there were heavy rain showers with some hail. Cloud cover was 4/8's, possibly decreasing after dark. The wind was nil/light by this time, although earlier had been a light south-westerly.

According to the BBC Weather website sunset in Falkirk was 17.48. The night involved was cloudy and so it was dark well before 18.36; the birds came in to roost some ¾ of an hour after sunset, when there was no natural light in the sky and they were only visible against the glow of the skyline to the east of the observation point, (or subsequently on East Fannyside Loch).

A.2, (cont.), Roost counts

23 November 2011 – pm – November Roost Count – Survey Activities and Observations	Roost count total: *c*.76 birds counted

In the early afternoon c.78 bean geese were counted in field 255 of the Hillend fields and 18 were counted in field 92, (and several birds in each flock were noted as being neck-collared birds). No other birds were located in what were less than ideal conditions for searching.

31 bean geese came in from the east at 16.41 and c.45 bean geese came in from the north-east at 16.43. These birds were witnessed by BCM from just NW of the bend in the Garbethill road and flew in to the north of this point. They were considered to roost on Fannyside Muir. No other birds were observed coming into roost; it is assumed that any skeins that did so were missed in the less than favourable viewing / listening conditions; certainly flock sizes corresponding to those observed earlier in the day were not recorded, (unless the flock of c. 78 had sub-divided into two smaller groups and arrived at the roost from rather strange directions). Observations ceased at 17.20.

The weather was poor with intermittent but persistent light rain. Cloud cover was 8/8's. This situation had applied for the hours preceding the roost count. The wind was south-westerly 2-3, as it had been earlier.

According to the BBC Weather website sunset in Falkirk was 15.55. The night involved was very cloudy and so it was dark well before 16.40; the birds came into roost some ¾ of an hour after sunset, when there was no natural light in the sky and they were only visible against the orange glow of the skyline to the north and west of the observation point.

Table A.2, (cont.), Roost counts

21 December 2011 – pm – December Roost Count – Survey Activities and Observations	Roost count total: *c*.160 birds counted

On the morning of the roost count, AM located and counted a flock of 160 bean geese in field 275. AM then advised BCM, who was conducting the roost count with Stuart Green, (SRG), that evening, of these details. Consequently, in the early afternoon, 160 bean geese were counted by SRG and BCM in field 275, (and the details of the several birds in this flock with neck-collars were successfully recorded).

Subsequently, AM again contacted BCM, and advised him that the farmer at Strathavon Farm, Mr Tom Findlay, had recently reported seeing a flock of bean geese in his fields. BCM and SRG visited Mr Tom Findlay and located a flock of *c*.500 pink-footed geese in the Avon valley immediately east of Slamannan, (and therefore in the area traditionally used by this species in winter). However, in the late afternoon, whilst still in this area, SRG and BCM also located *c*.78 bean geese in field 166. As this count was made soon after the count of 160 in field 275, this equated to a total number of *c*.238 bean geese, a figure which constituted the peak count of the winter.

Having located these two groups of birds, BCM and SRG then travelled to the roost area.

c.160 bean geese came in from the east at 16.31. These birds were seen by SRG and BCM from just NW of the bend in the Garbethill road as they flew in low and directly overhead. Although 5 birds briefly circled the wider area, the flock was seen to go in to roost on Fannyside Muir. No other birds were observed coming into roost; observations ceased at *c*.17.10.

Earlier in the day the weather was poor with low cloud and mist and intermittent but persistent light rain. Cloud cover was 8/8's. However, later the situation improved; by the time the roost count was made the wind speed had increased to 3 – 4, and this westerly wind dispersed the low cloud somewhat so the cloud cover was 6/8's.

According to the BBC Weather website sunset in Falkirk was 15.41. As indicated, the night involved was cloudy and so it was dark well before 16.31; the birds came into roost some ¾ of an hour or more after sunset, when there was no natural light in the sky and they were only visible as they alighted on Fannyside Muir against the orange glow of the skyline to the north and west of the observation point.

It was later speculated during discussions with AM that the *c*.78 birds seen earlier in field 166 may well have roosted elsewhere, and possibly in association with the Avon Valley pink-footed geese flock, (which often roosts on Darnrig Moss), or even on Loch Elrig, (where the bean geese formerly roosted).

Table A.2, (cont.), Roost counts

25 January 2012 – pm – January Roost Count – Survey Activities and Observations	Roost count total: 0 birds counted

As was indicated in the summary for the December roost count, AM speculated during discussions with BCM that the *c*.78 birds seen earlier that day in field 166 may well have roosted elsewhere, as they didn't appear at the Fannyside roost sites. Subsequent to this visit AM investigated this possibility, and successfully located a number of birds roosting on pools on Darnrig Moss. Therefore, it was agreed that a co-ordinated count of both this site and the 'traditional' Fannyside sites should be attempted on the selected roost count date in January. AM visited the Darnrig Moss area, and BCM visited the Fannyside Muir area. In the days preceding the roost count the geese had proved elusive, and although they had been seen to arrive at the Fannyside Muir roost from the Bandominie area a few days before the count, and 46 had been seen in fields at Wester Lochgreen on the day itself, there was no definite indication of where the majority of the birds were feeding, (and at which roost they would be arriving and from which direction).

AM flushed one small group of greylag geese on the approach to Darnrig Moss. However, no other geese were seen or heard here. BCM positioned himself at the northern end of the shelter-belt plantation alongside the bend in the Garbethill road in the anticipation that any birds would arrive from the north or north-east. Unfortunately, the noise of the strong wind in the trees hampered the survey, and so after the anticipated arrival time of the birds, when no geese had been seen or heard, (although very distant geese calls were suspected), BCM moved away from the trees towards Fannyside Muir itself. At this time, (*c*.17.23), he became aware of distant skeins of geese approaching the muir beyond the former railway. Large numbers were involved, too many to just be bean geese, and as BCM scanned these skeins repeatedly dropped below the horizon and then reappeared before finally disappearing, only to be replaced by further skeins doing the same. The birds appeared to be arriving from the north or north-east, and it was estimated that several hundred were involved. The birds were too distant to identify but quite possibly involved bean geese, pink-footed geese and greylag geese; (all three species had been seen in the area to the north in the past month). A small group of what were thought to be greylag geese flew closer, (as if wanting to roost on East Fannyside Loch), but returned back over the muir. Observations ceased at *c*.17.30, although BCM then travelled along the road over Fannyside Muir and listened for the geese without success.

The weather at the time of the roost count was reasonable, although as noted it was rather windy and there was some light showery rain later. Cloud cover was 8/8's. Earlier in the day the weather was brighter and calmer. However, by the time the roost count was made the wind speed had increased to at least 5 - 6. The wind was south-westerly.

According to the BBC Weather website sunset in Falkirk was 16.32. As indicated, the night involved was cloudy and so it was dark well before 17.23; the birds came into roost some ¾ of an hour or more after sunset, when there was no natural light in the sky and they were only visible as they alighted on Fannyside Muir against the orange glow of the skyline to the north and west of the observation point.

Table A.2, (cont.),Roost counts

15 February 2012 – pm – February Roost Count – Survey Activities and Observations	Roost count total: *c*.170 birds counted

The roost count was completed between 17.15 and 18.30. On this occasion, (unlike the previous month), it was not possible for both BCM and AM to simultaneously be present at the Fannyside sites and at Darnrig Moss respectively. Therefore, AM completed the usual count at the Fannyside sites.

Earlier that day, three distinct sub-flocks of bean geese were located on the Slamannan Plateau; these involved 10 birds in field 166 at Strathavon Farm at 10.34, 64 birds in field 278 at Parkhead Farm at 10.45 and *c*.100 seen at Wester Lochgreen Farm at 12.00.

The first geese arriving in the roost area were 60 greylag geese which alighted on West Fannyside Loch at 16.55.

It wasn't until 18.10 that any other geese arrived, and when they did they did so in several groups of geese which all appeared at the same time and landed on Fannyside Muir. By this time, (some 50 minutes after sunset), the light was poor making exact counts almost impossible, particularly as three different species of geese arrived at the same time.

However, AM managed to undertake a count which involved an estimated *c*.170 bean geese as well as 60 pink-footed geese and 100 greylag geese; presumably all the bean geese seen earlier in the day, (including those seen in field 166), roosted at Fannyside on this occasion.

The weather was mild, (*c*.8^{O}C), and overcast but dry. The wind was north-westerly 2-3. Sunset in Slamannan was at 17.18.

ANNEX B: OTHER DATA - RARE BIRD ALERT REPORTS OF TAIGA BEAN GEESE ON THE SLAMANNAN PLATEAU DURING WINTER 2011/2012

All reports for Clyde area, (*i.e.*, within North Lanarkshire Council boundaries), during winter 2011/2012

Taiga Bean Goose		Sent: Fri 17-Feb-12, 11:04am
150	Kirkintilloch, **(Clyde)** refers to : Fri 17-Feb-12 10:00am	Clyde 150+Taiga Bean Geese west of Kirkintilloch +east of Glasgow Bridge in field by A803 at 10am (+Eurasian White-fronted Goose)

Taiga Bean Goose		Sent: Tue 8-Nov-11, 6:44pm
130	Fannyside Lochs, **(Clyde)** refers to : Tue 8-Nov-11 "In Morning"	Clyde 130+Taiga Bean Geese 1.5mls SE of Fannyside Lochs in field north of B803 opposite Luckenburn Farm entrance this morning. Park carefully NS.823.723

Taiga Bean Goose		Sent: Mon 7-Nov-11, 10:50pm
188	Fannyside Lochs, **(Clyde)** refers to : Mon 7-Nov-11 "In Morning"	Clyde 188.Taiga Bean Geese 1.5mls SE of Fannyside Lochs in field north of B803 opposite Luckenburn Farm entrance this morning. Park carefully NS.823.723

Taiga Bean Goose		Sent: Sun 9-Oct-11, 4:36pm
117	Fannyside Lochs, **(Clyde)** refers to : Sun 9-Oct-11 1:30pm	Clyde 117.Taiga Bean Geese 1.5mls SE of Fannyside Lochs in fields north of B803 opposite Luckenburn Farm at 1.30pm. Park carefully NS.823.723

Taiga Bean Goose		Sent: Tue 4-Oct-11, 3:00pm
73	Fannyside Lochs, **(Clyde)** refers to : Tue 4-Oct-11 "In Morning"	Clyde 73.Taiga Bean Geese 1.5mls SE of Fannyside Lochs in fields north of B803 opposite Luckenburn Farm this morning. Park carefully NS.823.723

All reports for Forth area, (*i.e.*, within Falkirk Council boundaries), during winter 2011/2012

Taiga Bean Goose		Sent: Sat 25-Feb-12, 2:04pm
120	Slamannan, **(Forth)** refers to : Sat 25-Feb-12	Forth c120.Taiga Bean Geese Slamannan c500yds NE of Parkhead Farm

Taiga Bean Goose		Sent: Mon 2-Jan-12, 4:46pm
160	Slamannan, **(Forth)** refers to : Mon 2-Jan-12 3:00pm	Forth c160.Taiga Bean Geese NW of Slamannan at 3pm

Taiga Bean Goose		Sent: Mon 26-Dec-11, 10:42pm
75	Slamannan, **(Forth)** refers to : Mon 26-Dec-11 "In Afternoon"	Forth 75.Taiga Bean Geese 1/2ml north of Slamannan just east of Hillend Farm this a'noon

Taiga Bean Goose		Sent: Wed 21-Dec-11, 10:21pm
240	Slamannan, **(Forth)** refers to : Wed 21-Dec-11	Forth 160.Taiga Bean Geese 1/2ml NW of Slamannan. 80.Taiga Bean Geese 1/2ml NE of Slamannan

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ISBN: 978-1-85397-995-8

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