

# Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2012/2013





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# COMMISSIONED REPORT

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**Commissioned Report No. 608**

**Report on the delivery of a monitoring  
programme for bean goose on the  
Slamannan Plateau 2012/2013**

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## COMMISSIONED REPORT

# Summary

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### Report on the delivery of a monitoring programme for bean goose on the Slamannan Plateau 2012/2013

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#### **Background**

This report describes the results of the SNH monitoring, (*i.e.*, an ageing assessment and five roost counts), of the wintering flock of bean geese, (*Anser fabalis fabalis*), on the Slamannan Plateau area in Central Scotland undertaken between October 2012 and February 2013.

#### **Main findings (figures in brackets relate to the comparable figures for 2011/2012):**

- The ageing assessment count confirmed that c.18% of the geese that were aged were juveniles – 16 of 90 birds, (22.66%);
- The five roost counts produced a mean roost count total of 88 geese, (126); the maximum roost count was c.175, (220). On two of the roost count visits no geese were counted;
- 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 Bean Goose Action Group (BGAG) monitoring the SNH 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. For example, after the roost count on the 22 November, three separate field counts of 103, 76 and 54 birds were obtained in rapid succession; 233 was the peak count for the winter, (c.238). Further, such findings are now very successfully substantiated and added to by telemetry data; and,
- During 2012/2013 there was again evidence that a proportion of the bean goose population was roosting at Darnrig Moss at times. Further, other alternative roost areas were also used. As such it would seem that the Fannyside area, whilst still important, is no longer the only roost area used by some of the birds for at least part of the winter, perhaps explaining declining roost count totals; the maximum roost count of c.175 is substantially lower than the peak count for the winter of 233.

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## **Acknowledgements**

As ever, thanks are due to Angus Maciver for all his help. Thanks are also due to Carl Mitchell of The Wildfowl & Wetlands Trust, (WWT), for his helpful comments on the draft version of this report. Also special thanks to, in particular, both Carl Mitchell and Larry Griffin, also of WWT, who supplied tracking data mapping relating to the movements of the satellite and radio-tagged bean geese during the winter. Carl Mitchell also contributed one of the ageing assessment counts.



*Frontispiece, View over the pools at Fannyside Muir*

This photograph, (which deliberately incorporates a large amount of sky to convey a sense of wild, open space), provides an indication of the nature of the roost site at Fannyside Muir. This part of the muir is characterised by pools within a wide open expanse of raised bog covered by heathery vegetation, with distant views to stunted and planted coniferous trees. It is considered that this is of significance as the area looks and 'feels' very similar to taiga, the habitat with which taiga bean geese, (*Anser fabalis fabalis*), is associated with on its breeding grounds in boreal latitudes of Scandinavia and Russia.

## 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 2012/2013 wintering period by Angus Maciver, (AM), and Brian Minshull, (BCM).

It represents the third such report, following those prepared for the preceding winters, (*i.e.*, for winter 2010/2011 and 2011/2012).<sup>1</sup> 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 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,<sup>2</sup> (BGAG), monitoring.<sup>3</sup> Further, this work is largely conducted on behalf of the BGAG by the same individual who undertakes much of the SNH monitoring, namely AM, to the same standards. Further, there is often considerable overlap between the two; and where necessary, this report makes reference to this.

The monitoring work described in this report was undertaken between 26 September 2012, when the Slamannan Plateau population of bean geese first began to arrive on their wintering grounds from the breeding areas, and c. 26 February 2013, the estimated date of the final departure of birds, (these dates were determined on the basis of evidence provided by the BGAG monitoring visits).<sup>4</sup>

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 corresponding reports for winter 2010/2011 and 2011/2012), the preceding reports should be referred to.

### 1.2 SNH monitoring effort – winter 2010/2011 onwards

The SNH monitoring effort necessitates:

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<sup>1</sup> 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* and 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*.

<sup>2</sup> The Bean Goose Action Group is described more fully in the report for winter 2010/2011.

<sup>3</sup> In the report for winter 2010/2011 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.

<sup>4</sup> In addition to dawn visits to the roost site by AM to investigate the ongoing presence of birds, *etc.*, during winter 2012/2013 the dates of departure of birds in early spring was very much informed by the data available from the satellite tracking of four of the birds within the flock.

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

In August 2011, SNH commissioned BCMESL to undertake the SNH 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 – 2012/2013**

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 Tracking data**

Following the failure of four tracking devices deployed in autumn 2011, a further six birds were successfully captured, ringed, colour-ringed and fitted with numbered neck-collars as part of the ongoing scientific studies of these birds in autumn 2012. The neck-collars incorporated either a satellite or a radio-tracking device which use data-logging and transmitting technology.

As such, not only do the colour-rings and neck-collars allow individual birds, and therefore individuals within a family unit, and therefore family relationships, to be identified and followed in the field, the innovative technologies involved also allows geographic and other data to be recorded on a regular basis, and then remotely received or downloaded. The interval at which data is recorded can be varied depending on what location data is required. The tracking devices are battery powered, but the battery is supplemented by a solar energy panel in order to maximise the useful life of each unit.

As a result, data are now being generated which both substantiates what is already known about the usage of the plateau by feeding and roosting birds, but also improves this knowledge. It should also reveal much more than is currently known about the migration strategies used by the population each autumn and spring, and the location of the breeding grounds and moulting areas used during the summer, which are currently unknown.

It is not the place or purpose of this current report to describe the information produced by this tracking technology; this will be reported elsewhere. However, it is pertinent to mention this as the tracking data in several instances informed the monitoring activities described in this report.

### **1.5 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:
  - 1<sup>st</sup> visit during October;
  - 2<sup>nd</sup> visit during November;
  - 3<sup>rd</sup> visit during December;
  - 4<sup>th</sup> visit during January; and,
  - 5<sup>th</sup> 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, (and in 2011/2012), were again adhered to during 2012/2013.

The findings of the ageing assessment count and the roost counts completed in 2012/2013 are summarised in Tables 3.1 and 3.2. Further, these visits are described in full in Annex A; where the approaches used in 2012/2013 differed slightly from those described in the 2010/2011 report this is described in the tables provided in Annex A.

### 3. SUMMATION OF RESULTS OF 2012/2013 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.

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

Date	Number of birds aged and number of juveniles aged (%)
5 November 2012	Number of birds aged – 90, of which 16, (c.18%), were juveniles

*Table 3.2. Summary of bean goose observations – roost counts*

Date	Roost count totals recorded (estimated number of birds)
24 October 2012	Birds counted c.175 <sup>5</sup>
22 November 2012	Birds counted u/k
26 December 2012	Birds counted c.125
24 January 2013	Birds counted 0
15 February 2013	Birds counted c.140
	Average of roost count totals recorded (rounded up) 88

Further, Annex A: Details of Bean Goose Counts, includes further tables which provide more details of the bean goose counts undertaken in winter 2012/2013; 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.*.

As such, 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.

<sup>5</sup> Concurrently, a further 51 birds probably roosted at Darnrig Moss.

## **4. DISCUSSION OF RESULTS OF 2012/2013 SURVEY VISITS**

### **4.1 Introduction**

This section discusses the findings of the 2012/2013 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 5 November 2012, 90 bean geese were aged by Angus Maciver in the late morning in the Luckenburn fields. Of these, 16 were aged as juveniles; that is c.18% of those aged were juveniles, (compared to a proportion of 31% in autumn 2010, the highest ever recorded on the Slamannan Plateau)<sup>6</sup>. It was also possible to count the numbers of juveniles with pairs of adults; family parties which involved four, two, two, two, two, two, one and one juvenile respectively were counted, (a mean brood size, (mbs), of 2.0 young per successful pair; this compares with a mbs of 2.07 recorded in winter 2010/ 2011).

Prior to this, Carl Mitchell, (WWT), also conducted an ageing assessment count on the 14 October 2012 during efforts to catch some of the bean geese for ringing and marking purposes using cannon-netting. A total of 127 bean geese were aged in the late morning in the Luckenburn fields, and just 11 were aged as juveniles, (9% young).

Both of these counts are detailed 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 / different parts of the flock). It is not known which is the more representative; the one carried out by Carl Mitchell was the larger sample and it is perhaps more representative of the total flock present on the Plateau at this time. However, if accurate and representative, counts of between 9% and 18% are undoubtedly indicative of a poor to average breeding season.

Finally, it is also noted that the birds marked with neck-collars in autumn 2011 and autumn 2012 included several pairs / family groups, and monitoring in winters 2011/2012 and 2012/2013, (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 2012/2013.

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. Further, for the first time, the roost counts were to some extent informed by the newly available satellite or radio tracking data available for six of the birds, and as appropriate this too is mentioned.

#### **4.H1 October roost count**

At this stage in the wintering period the flock is typically associated with the Luckenburn fields. Indeed, the roost count of c.175 made on the 24 October involved birds arriving from the south or south-east, *i.e.*, from the direction of Luckenburn. All 175 geese roosted at the

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<sup>6</sup> 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](http://monitoring.wwt.org.uk/pdf/GooseNews10.pdf).

Fannyside Muir pools. During the roost count there was evidence of some local interchange of birds between the various parts of the roost area. In addition, 46 pink-footed geese, (*Anser brachyrhynchus*), also roosted there.

Earlier in the day, AM had recorded 146 bean geese in field 276 near Hillend Farm, although they were no longer there as AM and BCM passed by on the way to the roost count area at around 17.30. However, the birds which were observed coming in to roost undoubtedly involved the same birds that had previously been seen by AM in field 276.

Further, prior to the roost count AM and BCM observed 51 bean geese in field 166 near Strathavon Farm. It is suspected that the 51 bean geese seen earlier near Strathavon Farm probably roosted at Darnrig Moss, (which is much closer to field 166 than are the Fannyside roost sites). Indeed, the evidence provided by some of the early results of the tracking confirmed that in the days before the roost count a bird which had been feeding in fields in the Strathavon Farm area during the day was later roosting nearby at Darnrig Moss that night.

The count of c.175 birds made at the Fannyside roost plus the 51 birds which probably went to roost at Darnrig Moss produced a total of 226, and as such can be considered to be very representative of the known wintering population size at this stage of winter 2012/2013. For example, during field counts made as part of the BGAG monitoring on the 10 and 30 October counts of 213 and 208 birds were made at Luckenburn.

Finally, it should perhaps be noted that the night involved was a fine, clear, cold and calm one, and possibly as a result, the arriving birds appeared between about 40 and 55 minutes after sunset, and as such were perhaps a few minutes later relatively to sunset than it would have been on a cloudier night; frequently on such nights the birds arrive 45 minutes after sunset.

#### *4.H2 November roost count*

No bean geese were definitely recorded coming into roost at Fannyside on this occasion; although 30 – 40 geese arrived to roost at the pools on Fannyside Muir these could not be specifically identified. However, it subsequently emerged from the tracking data that one of the satellite tagged birds roosted at the pools on the night of the 22 / 23 November. Concurrently, no bean geese were recorded from another location to the south of Fannyside in the Upper Avon valley.

As such, it was considered that it was more likely that the birds had roosted elsewhere on this occasion as opposed to being missed by the observers at Fannyside and the Upper Avon valley. Indeed it was speculated by AM and BCM at the time that the prolonged period of rain during the days preceding the roost count had created significant areas of flooding in the Avon valley and elsewhere, and it is possible that at least some of the birds opted to roost on floodwaters close to feeding areas they had favoured during the day. For example, on 23 November a total of 233 birds were recorded, (representing the winter maxima for 2012/2013 at this time), and these birds were counted in three different locations, namely field 285 of the Threaprig fields, where there were 76 birds, field 120 of the Easter Jawcraig fields where there were 103 birds and field 166 of the Strathavon fields where there were 54 birds, (and birds in each flock were noted as being neck-collared). Thus, the peak flock size recorded this winter involved the summed total of three separate flocks for which accurate or reasonably accurate counts were made. These counts were made within a short period of time at three different locations on the plateau. More typically, the winter maxima, (the peak count<sup>6</sup>), 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 such, it was considered at least some of these birds may well have roosted on the extensive floods that were present north of Slamannan village at this time.

However, at the end of the 2012/2013 wintering period AM visited fields in the Upper Avon valley as part of some field work that was being conducted. Here, in the area known as Field 13A he found an extensive area of vegetation flattened by floodwaters adjacent to the upper reaches of the River Avon. It was in this area that, in the days preceding the November roost count, evidence obtained from satellite-tagged birds indicated that, whilst birds roosted at Fannyside Muir, (where a registration of one of the neck-collared / satellite tagged birds was recorded), some other birds also had roosted at another location to the south, as registrations of two of the neck-collared / satellite tagged birds, (with which other birds were closely associated as part of family groups), were recorded in the vicinity of Field 13A soon after dusk on the 17 November and soon after dawn on the 18 November respectively.

As a result, it is now believed that at least part of the bean goose flock roosted here on the night of the 22 / 23 November, despite no birds being seen or heard by BCM who was stationed nearby on the roadside to the east. Further, it is also considered quite likely that these birds might have been feeding nearby earlier in the day, and as such wouldn't be seen or heard flying into this area.

Therefore, on this occasion, the number of birds actually recorded coming into roost had little similarity with the flock size that was counted on the following day, (when the highest count for the winter was recorded). Certainly flock sizes corresponding to those observed earlier in the day were not recorded, although subsequently it was suspected that the 40 un-identified geese that were recorded were probably bean geese.

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 unhelpful for recording purposes, again the birds came in some hour or so after sunset and it subsequently emerged or was suspected that at least some of the flock roosted in other locations.

Therefore the count total given is not representative of the numbers of bean geese present on the plateau at this time.

#### *4.H3 December roost count*

On the 26 December, the birds recorded coming in to roost involved four birds, which came in from the south, and then a flock made up of what was considered to be c.120 birds, which came in from the east. They all roosted on Fannyside Muir. No other incoming groups were recorded in what were generally suitable conditions.

The following day AM located a flock of 120 Bean Geese, including one of the neck-collared birds, in field 285 at Threaprig, directly east of the Fannyside roost site. As such it is reasonable to speculate that it was this same sub-flock which had flown into roost from this direction the previous evening.

In terms of the overall flock size of c.233, as recorded the day after the November roost count, it would seem that a similar number of birds either roosted elsewhere, or, for whatever reason, were not recorded arriving at the Fannyside roost sites.

It is suspected that the 'missing' birds were indeed roosting elsewhere; last winter for example, birds were recorded roosting at Darnrig Moss.

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 2012/2013; however, at this time an additional 110 or so birds were seemingly feeding and roosting elsewhere.

#### *4.H4 January roost count*

During the January roost count visit no bean geese arrived at the Fannyside roost sites. Further, the large flock of c.250 pink-footed geese that had been seen during a BGAG monitoring roost count visit on the 11<sup>th</sup> January did not appear either.

In the weeks preceding the January roost count the tracking data suggested that many of the geese had been feeding during the day in the fields at Beam Farm. Therefore, it was assumed that this part of the flock had opted to remain there overnight; the roost count occurred during a spell of cold, settled weather as a high pressure area over Norway dominated.

#### *4.H5 February roost count*

A roost count of c.140 bean geese was made by AM and BCM on 15 February. c.80 birds arrived from the north and as such it was suspected that they had been feeding in fields at Wester Lochgreen Farm and c.60 more arrived from the north-east and as such it was suspected that they had been feeding in fields at Beam Farm. All 140 birds roosted on Fannyside Muir.

The count was considered to be representative of what was the known wintering population size at that stage of the winter. For example, earlier in the month, during BGAG monitoring visits, roost count totals of 120 and 108 geese had been counted on the nights of 11 and 12 February, whilst a field count of 115 geese was achieved on the 15 February.

#### *4.H6 All roost counts*

In broad terms, the five roost counts again produced data that was of a representative quality, (*i.e.*, similar to that produced by the BGAG monitoring effort, and the monitoring that was undertaken in previous years). However, in both 2010/2011 and 2011/2012, 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, at least in the remaining instance in 2011/2012, 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 such, in 2012/2013 the 'success rate' was lower, although it was again suspected that bean geese arrived to roost at Fannyside during the November roost count.

As described in the 2010/2011 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 each or any combination of West Fannyside Loch, East Fannyside Loch or Fannyside Muir is only partially understood).

In comparison to winter 2010/2011, which was comparatively cold with prolonged spells of snow and ice, and to winter 2011/2012, which was relatively mild, with very little snow and ice, winter 2012/2013 perhaps involved a mixture of both.

The five roost counts produced a mean count of 88 geese, (*i.e.*,  $175 + 0 + 125 + 0 + 140 = 440/5$ ). The standard deviation for all 5 roost count visits was 82.36, which reflects skewed sample caused by the null counts. Conversely, if the null counts are disregarded, the successful roost count visits produced a mean count of 147 geese, for which the standard deviation was 25.66. 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 and 2011/2012 with those obtained during winter 2012/2013. 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 2012/2013 proved to be very different to the preceding ones.

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 2012/2013 were lower than those recorded in both of the preceding winters.

No dawn roost counts were completed as part of the SNH monitoring during winter 2012/2013; further, it was generally confirmed that geese arriving at the roost sites did so approximately 45 minutes after sunset.

As was detailed in the SNH monitoring report for winter 2010/2011, 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 2010/2011 report, for the reasons outlined, if visits such as the November and January roost counts were 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.

Therefore, 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.

*Table 4.1 Comparison of 2010/2011 and 2011/2012 and 2012/2013 Roost Counts*

2010/2011 Dates	Roost count totals	2011/2012 Dates	Roost count totals	2012/2013 Dates	Roost count totals
28 October 2010	225	26 October 2011	c.220	24 October 2012	c.175
24 November 2010	236	23 November 2011	c.78	22 November 2012	u/k
22 December 2010	0	21 December 2011	160	26 December 2012	c.125
20 January 2011	200	25 January 2012	0	24 January 2013	0
16 February 2011	245	15 February 2012	c.170	15 February 2013	c.140
Average (rounded up)	181	Average (rounded up)	126	Average (rounded up)	88

During the 2012/2013 winter period, and for the first time ever, updated records from the tracking data were frequently made available, and informed both the undertaking of the roost count visits, and the interpreting of the circumstances recorded. As such, these data both complemented and supplemented that available from the BGAG monitoring. It is not proposed to provide more detail about this here, nor is it considered appropriate to do so. As has already been indicated the findings of the tracking data will be reported separately elsewhere. However, it should be reiterated here that this new innovation has been a benefit to monitoring the Slamannan Plateau bean geese population, in ways that have been both confirmatory, in terms of what was already known due to the monitoring efforts of AM and others, but also revelatory, in terms of significantly adding to this knowledge.

For example, in terms of roosting behaviour alone it has revealed more about use of alternative roosts such as Darnrig Moss and Field 13A in the far north-east and far south-west corners of the Slamannan Plateau study area respectively. It has also revealed more about the patterns of distribution of roosting birds at the main roost sites, both in terms of how this changes from night to night, but also how this changes within any given night. In addition, and of elevated significance given the continuing threats to Fannyside Muir despite its notification as part of the Slamannan Plateau Site of Special Scientific Interest, (SSSI), and (Special Protection Area), it has revealed more than occasional use of areas of Fannyside Muir by roosting birds away from the 'core roost area' associated with the pools.

#### **4.4 Findings in the context of the BGAG monitoring data**

Figure 4.1, provides a graph illustrating data gathered during SNH roost counts, (red columns), compared to that gathered from all BGAG monitoring, (*i.e.*, field and roost), counts, (blue columns).

All five SNH roost counts can be seen, (although those for November and January are 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 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 located on some visits, especially when birds are using feeding areas that are not accessible/viewable. Conversely, and certainly before the birds started using alternative roost sites on a more frequent basis, 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, December and February roost counts completed as part of the SNH monitoring during winter 2012/2013 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 the few SNH visits to the roost and/or plateau that were completed throughout the winter, (both in terms of variation and in terms 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; and,
- Roost counts in October, December and February, (*i.e.*, each of the successful roost counts), which were comparable with field counts at this time but decreased during this time, possibly reflecting the fact that some of the flock was roosting, and indeed

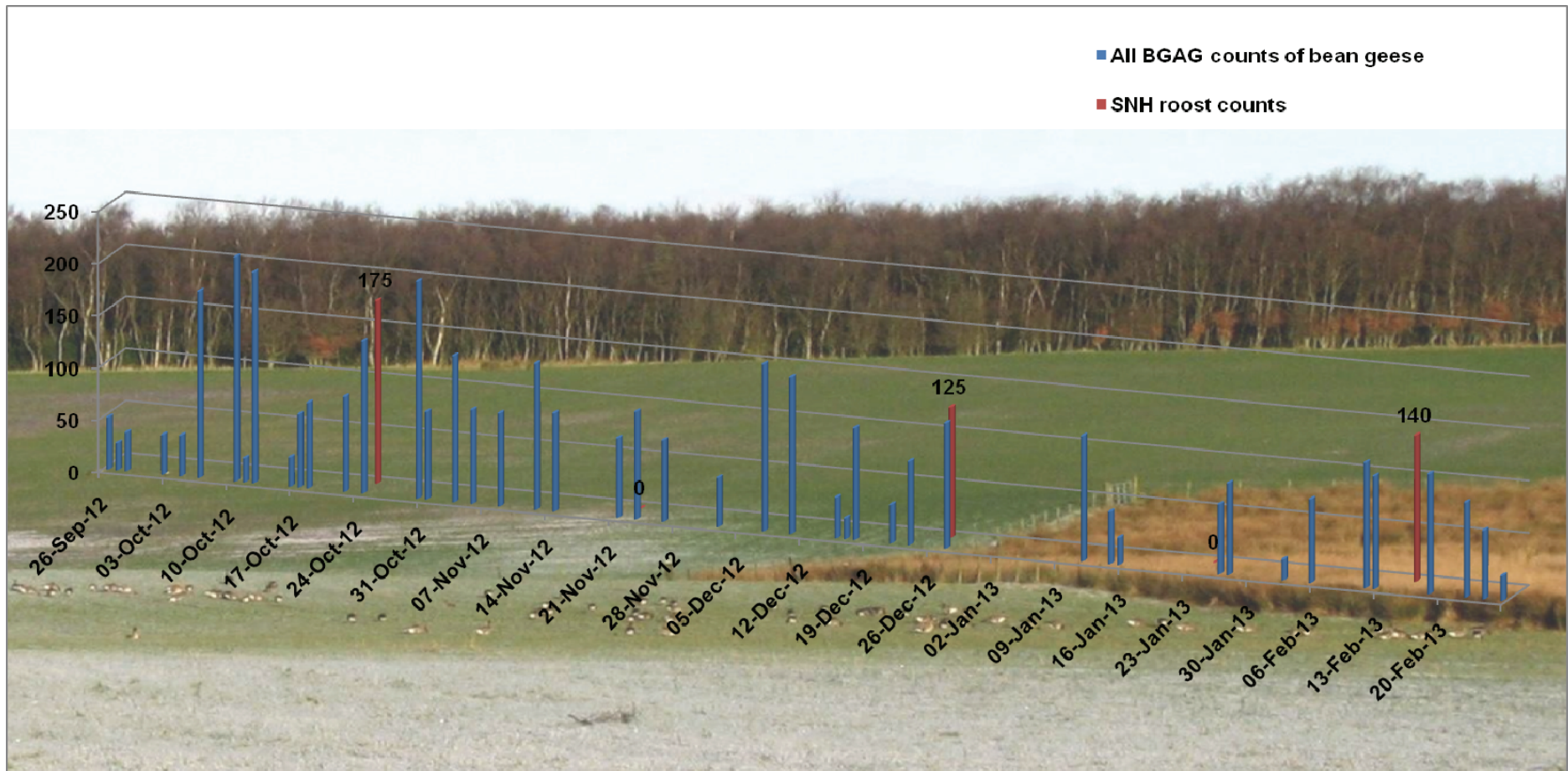


Figure 4.1. Graph illustrating data gathered during SNH roost counts compared to that gathered from all BGAG counts

Note: both the November and the January roost counts, in effect, returned null counts and as such do not appear as red columns.

feeding, elsewhere, (and as such was often not located / counted during the field and roost counts);

- 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 involving the WWT;
- Relative paucity of any counts during parts of the winter, including January, when the birds could not be readily located on the plateau; and,
- That the peak count of c.233 obtained in November is not evident in the graph as it was derived from three 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 both the highest count totals achieved in both 2010/2011 and 2011/2012 of 267 and c.238 respectively.

As was noted in the report for 2011/2012, it 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 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 2010/2011 report, (which should be referred to as necessary), but is re-emphasised here, not least because in winter 2012/2013 there was again good evidence that at least parts of the Slamannan Plateau bean goose population were using alternative roost sites on some nights.

As a result, (as was stressed in the 2010/2011 report), 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, (or at least that was the case until the advent of the tracking data this winter). This component of the overall monitoring effort therefore remains 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, as noted in the previous report, it has been apparent in the past few 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 to 2012/2013 inclusive 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 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). This pattern of field usage – and use of the alternative roost site – continued during winter 2012/2013.

It is hoped that another project funded by SNH will provide the basis for a clearer understanding of field usage preferences and the way in which this has been subject to a process of continual but gradual changes throughout the BGAG monitoring period.

Further, as has already been outlined, the tracking data which is now available is already proving an invaluable aid to the monitoring work. Whilst it can only ever indicate the presence of individual birds, (and not provide accurate counts or estimates of the numbers of bean geese involved, or undertake ageing assessments), it can certainly provide good data on the frequency at which alternative roost sites are used throughout the winter, and, as necessarily, potentially for all nights throughout the winter, (rather than just a very small sample of the same), and give highly accurate 'fixes' for these birds at various intervals throughout the winter.

Also, (as was also emphasised in the 2010/2011 report), the BGAG monitoring effort 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.

In summary, all of these approaches contribute to the overall understanding of the Slamannan Plateau bean goose population, and each complements the others. However, it may be appropriate to re-appraise the efficacy of the SNH monitoring effort in future years given the findings of the past winters, and in relation to the data available from the other sources and approaches.

#### **4.5 Other data**

As was described in the 2010/2011 report, in addition to the data available as a result of the BGAG monitoring effort, data relating to the Slamannan Plateau bean goose population is available from readily available resources such as specialist e-groups and websites. Although such information must be used with caution, (for the reasons described in the 2010/2011 report), this information is still potentially useful.

As such, information from the Rare Bird Alert, (RBA), website was provided in the Appendices of the preceding reports, and Annex B: Other Data - Rare Bird Alert Reports of Taiga Bean Geese on the Slamannan Plateau during Winter 2012/2013, provides the same information for winter 2012/2013.

Compared to winter 2010/2011, (and as with winter 2011/2012), the number of reports of bean geese made to RBA during winter 2012/2013 was much reduced. AM and BCM rarely, if ever, report the sightings made during the BGAG and SNH monitoring.

The relative paucity of records detailed on RBA during winter 2012/2013 compared to winter 2010/2011 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.

As in the preceding winters, most of the records on the RBA website for winter 2012/2013 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). One record is somewhat interesting as it is from a location in the former stronghold in east of the plateau. However, there is no independent confirmation of this record so no great credence should be given to it, and it may simply relate to birds in the Strathavon Farm area.

## 5. CONCLUSIONS AND RECOMMENDATIONS

In effect, the SNH monitoring work described in this report is, in part, 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 2012/2013 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 commensurate 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.

In this context, this report concentrates on providing a description of the results obtained during the 2012/2013 winter; it also provides some discussion of the same. This section attempts to summarise the key conclusions and recommendations relating to these results.

It is reiterated that the findings of the SNH monitoring are very much complemented by those of the BGAG monitoring and also, this winter, for the first time, by the data generated by the satellite- and radio-tracking. That is, in isolation, the SNH monitoring has somewhat limited value, but this value is greatly increased if the findings of both the SNH monitoring and these other sources and techniques are used in close conjunction.

As an example of this, the peak count obtained during the roost counts *per se* was 175. However, the peak count during winter 2012/2013 was c.233, (a total which was established due to the efforts of AM the day after the November roost count had been completed as part of the SNH monitoring).

In isolation, then, if the SNH monitoring was the only such work being undertaken, the assumed peak count in winter 2012/2013 would be 175, which is 58 birds less than the peak count recorded during all monitoring work, (or only 73.53% of the 'actual' total). It is proposed by BCM that this is the most significant 'finding' of this report.

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 five nights.

Concurrently, (and utilising the same expertise), 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.45, (in the instance of 2012/2013), days during the winter, (whether these areas are inside or outside the SSSI/SPA). In addition, it also provides a range of other useful information relating to the dates the wintering population arrive and leave, and any records of other goose species and disturbance. It should be noted that during winter 2012/2013 not as many BGAG monitoring visits were made by AM as usual, partly as it was considered that the newly available tracking data was providing sufficient information as to the whereabouts of the birds, (Angus Maciver, *pers comm.*).

However, used in conjunction, 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 also allied to the new initiatives which have already resulted in the individual marking with neck-collars of 21 individual bean geese, and the successful fitting with telemetry devices of six of these birds.

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

Again, it is considered that the efficacy of the ageing assessment counts compared to those made previously is high. As such, 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.

However, as was commented in the preceding reports, in terms of the efficacy of SNH monitoring roost counts, the situation is somewhat less straightforward. As already indicated, the peak count for the winter was c.233 birds; whereas the maximum roost count total achieved was 175 birds. Again, as in the previous winters, 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 January roost count). As has been demonstrated both this winter, and in the previous two, if roost counts alone were relied on this could potentially only provide less than five 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.

As has been mentioned, 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 involved in designating parts, (including productive agricultural areas), of the plateau as a SSSI/SPA for bean geese it is imperative that a good understanding of this situation is maintained. Much of the information required in terms of numbers of birds, etc., using the plateau is only provided by the BGAG monitoring. As has been long anticipated, the use of tracking devices will greatly facilitate this. This has now been successfully achieved and is producing excellent data about the ongoing whereabouts of six of the birds.

As described, the marking and/or tracking studies, which commenced in October 2011, quickly started to provide more information about the Slamannan Plateau population of bean geese, and now that tracking devices have successfully been fitted and have properly worked since October 2012 this too has rapidly started to produce a wealth of information about the 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.

It is too early to say whether the declining roost count totals at Fannyside which have been recorded over the past three winters are part of a real trend; certainly the SNH monitoring involves too few counts and produces too few instances of successful counts for it to be a representative sample of what is known to be a complex and dynamic situation. However, it does appear that a range of other roosting strategies and sites are increasingly being used.

Winter 2012/2013 was the penultimate winter of a three year contract for the SNH monitoring work. Given the restricted utility of the monitoring work involved without reference to the BGAG monitoring work, and given the significant advances in available data relating to the movements of the bean goose population as a result of the satellite- and radio-tracking it is recommended that the scope of the SNH monitoring work is re-appraised in the near future in the light of this fluid situation so that scarce resources can be better targeted in order to produce more useful data regarding the qualifying species of the SSSI/SPA.

## 6. REFERENCES

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Maciver, A. 2013. *Population and Distribution of Bean Geese in the Slamannan Area 2012/2013*, The Bean Goose Action Group, (final report not yet in preparation, but is pending, and the data therein was provided by Angus Maciver on an interim basis).

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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5 November 2012 – am – Ageing Assessment Count – Survey Activities and Observations

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90 bean geese were aged in the late morning in the Luckenburn fields. This ageing count was conducted by AM. Of these just 16 were aged as juveniles, (c.18%). In addition, it was possible to count the numbers of juveniles with pairs of adults; family parties which involved 4, 2, 2, 2, 2, 1, and 1 juvenile respectively were noted. 16 juveniles in 8 broods obviously computes as a mean number of juveniles with adults of 2.0, which compares favourably to that recorded in winter 2010 – 2011, when the same figure was computed as 2.07.

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

(Carl Mitchell, Principal Research Officer – Waterbird Monitoring, WWT, also conducted an ageing count on the October whilst visiting the plateau to undertake a further cannon-netting and ringing and marking exercise. 127 bean geese were counted in the late morning in the Luckenburn fields. Of these, just 11 were aged as juveniles, (c.9%).

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 / and also potential differences in the location of juveniles in the flock). It is not known which is the more representative; certainly the count conducted by AM is closer to the proportion of juveniles recorded in the previous winter when two counts achieved values of 18 and 23%. Conversely, the one carried out by Carl Mitchell was the larger sample and it is perhaps more representative of the total flock present on the Plateau at this time. However, if accurate and representative, counts of 9 and 18% are undoubtedly indicative of a poor to average breeding season.

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## A.2, Roost counts

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24 October 2012 – pm – October Roost Count – Survey Activities and Observations

Roost count total: c.175 birds counted

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Prior to the roost count AM and BCM observed 51 bean geese in field 166 near Strathavon Farm. In addition, AM had recorded 146 bean geese in field 276 near Hillend Farm earlier in the day, although they were no longer there as AM and BCM passed by on the way to the roost count area at around 17.30.

It was decided to observe birds arriving at the Fannyside roost sites from just NW of the bend in the Garbethill road.

At 18.30 c.75 birds came into roost from the SE, arriving in two skeins and alighting on the Muir. Subsequently, at 18.34 c.80 birds and at 18.43 c.20 birds were similarly seen arriving from the SE, flying low over East Fannyside Loch and alighting on the Muir.

In addition, 46 pink-footed geese were seen. They also landed on the Muir, and came in from the W. Finally, at 18.50 2 un-identified geese were seen, although as with a subsequent observation, these may have been birds moving within the roost. As such, some 175 bean geese appeared to use the Fannyside roost location on this occasion; it would seem that the birds arriving at the roost did so from the Luckenburn area, and undoubtedly involved the same birds that had previously been seen by AM in field 276.

Further, it is suspected that the 51 bean geese seen earlier near Strathavon Farm probably roosted at Darnrig Moss, (which is much closer to field 166). Indeed, the evidence provided by some of the early results of the tracking confirmed that in the days before the roost count a bird which had been feeding in fields in the Strathavon Farm area during the day was later roosting nearby at Darnrig Moss that night.

The weather at the time of the survey visit, (and earlier), was very suitable for the roost count; it was fine, clear, cold and calm. Cloud cover was 0-1/8's and the wind was nil/light; at dusk mist pockets were beginning to form in the nearby upper Avon Valley.

According to the BBC Weather website sunset in Slamannan was 17.49. As suggested, the night involved was clear and so it remained reasonably light for some while after sunset and as such the birds came in between about 40 and 55 minutes after sunset, (perhaps a few minutes later relatively to sunset than it would have been on a cloudier night; frequently on such nights the birds arrive 45 minutes after sunset).

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

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22 November 2012 – pm – November Roost Count – Survey Activities and Observations

Roost count total: unknown

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In the days preceding the roost count evidence obtained as a result of the satellite-tagging of bean geese in autumn 2012 indicated that whilst birds roosted at Fannyside Muir, (where a registration of one of the neck-collared / satellite tagged birds was recorded), some birds had roosted at a location to the south of the Fannyside roosts, as registrations of two of the neck-collared / satellite tagged birds, (with which other birds were closely associated as part of family groups), were recorded in locations here soon after dusk on 17 November and soon after dawn on 18 November respectively.

Therefore, on the evening of the roost count BCM was positioned on the roadside near the River Avon bridge looking west over the area of muir defined as Field 13 in case any birds that had been feeding in adjacent areas to the west and south flew in to the Fannyside roosts from this direction. Concurrently, AM and Ian Ludbrook were positioned at the area of hard-standing associated with the former peat-works at Fannyside Muir.

In the event no bean geese were recorded and observations ceased soon after 17.00. However, 30 – 40 un-identified geese came in to roost on the pools at Fannyside Muir at 17.00; subsequently it was established that one of the autumn 2012 neck-collared / satellite tagged birds was recorded as roosting at the pools on the night of 22 / 23 November.

According to the BBC Weather website sunset in Falkirk was 15.58. The weather was poor; there had been consistent rain in both the hours and the days preceding the roost count, and during the count itself there was but persistent light rain. Cloud cover was 8/8's. The wind was a very light south-westerly; it had been force 2-3 earlier, but was just force 1 during the survey. The night involved was very cloudy and so it was dark well before 16.40. The birds that came into roost did so an hour after sunset, when there was no natural light in the sky.

As no other birds were observed coming into roost it is assumed that either any skeins that did so were missed in the less than favourable viewing / listening conditions or came in subsequently, or more likely, birds roosted elsewhere; the prolonged period of rain during the preceding days had created significant areas of flooding in the Avon valley and elsewhere, and it is possible that at least some of the birds opted to roost on floodwaters close to feeding areas they had favoured during the day. For example, on the 23 November a total of 233 birds were recorded, (representing the winter maxima for 2012/2013 at this time), and these birds were counted in three different locations, namely field 285 of the Threaprig fields, where there were 76 birds, field 120 of the Easter Jawcraig fields where there were 103 birds and field 166 of the Strathavon fields where there were 54 birds, (and birds in each flock were noted as being neck-collared); at least some of these birds may well have roosted on the extensive floods that were present north of Slamannan village at this time.

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

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26 December 2012 – pm – December Roost Count – Survey Activities and Observations

Roost count total: 125

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On this occasion there was limited information relating to the whereabouts of any feeding flocks in the days preceding the roost count.

It was decided to observe birds arriving at the Fannyside roost sites from just NW of the bend in the Garbethill road.

Four bean geese came in from the south a few minutes before c.120 bean geese came in from the east at 16.41. All of these birds roosted on Fannyside Muir.

Some 30 minutes before these c.40 greylag geese came in, apparently from the west, and were watched circling widely over both Fannyside Muir and the Fannyside Lochs for some while before departing.

According to the BBC Weather website sunset in Slamannan was 15.46. The weather was reasonable at the time of the survey as it had been earlier in the day. The cloud cover was 8/8's and there was an easterly wind of Force 2 or 3.

As indicated, the night involved was cloudy and so it was dark well before 16.41. Therefore, the birds came into roost almost an hour 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.

The following day AM located a flock of 120 Bean Geese, including one of the neck-collared birds, in field 285 at Threaprig, which is directly to the east of the Fannyside roost site. As such, it is reasonable to speculate that it was this same sub-flock which had flown into roost from this direction the previous evening.

In terms of the overall flock, there were therefore a similar number of birds that either roosted elsewhere, (or, for whatever reason, were not recorded arriving at the Fannyside roost sites).

It is suspected that the 'missing' birds were indeed roosting elsewhere; last winter for example, birds were recorded roosting at Darnrig Moss.

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

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24 January 2013 – pm – January Roost Count – Survey Activities and Observations

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Roost count total: 0 birds counted

In the weeks preceding the January roost count the tracking data suggested that many of the geese had invariably been feeding in the fields at Beam Farm during the day.

Prior to the roost count a search for the bean goose flock was made in the late afternoon throughout the central part of the study area, *i.e.*, between Balmitchell and the Fannyside area but no sightings were made.

AM arrived at the roost sites well before dusk and stayed on site until 17.40 but no bean geese arrived on any of the usual Fannyside roost sites. Further, the large flock of c.250 pink-footed geese that had been seen during a BGAG monitoring roost count visit on the 11 January did not appear either.

Therefore, it was assumed that the flock which had probably been feeding at Beam Farm earlier in the day had opted to remain there overnight.

According to the BBC Weather website sunset in Slamannan was 16.33. The weather at the time of the roost count was reasonable; although it was cold with some lying snow and the temperature was 0°C there was no precipitation and a very light southerly wind adjudged to be S 1 – 2. Cloud cover was 8/8's. Both Fannyside Lochs were frozen with only a small amount of open water. The pools on Fannyside Muir were also frozen. The general weather situation involved high pressure over Norway which was producing a gentle southerly airflow over much of Scotland. The weather forecast at the time was for it to remain cold, with scattered wintry showers.

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

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15 February 2012 – pm – February Roost Count – Survey Activities and Observations

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Roost count total: c.140 birds counted

The roost count was completed between approximately 17.35 and 18.30. On this occasion, both BCM and AM completed the count at the Fannyside sites. It was decided to observe birds arriving at the Fannyside roost sites from just NW of the bend in the Garbethill road.

The first group of geese arriving in the roost area were c.80 bean geese which arrived from the north and alighted on Fannyside Muir at 18.04. Due to the direction from which they arrived, it was suspected that these birds had been feeding in fields at Wester Lochgreen Farm.

Subsequently 60 pink-footed geese were seen flying over the roost. They arrived from the west and continued to the north-east.

The third group of geese arriving in the roost area were c.60 bean geese which arrived from the north-east and alighted on Fannyside Muir at 18.15. Due to the direction from which they arrived, it was suspected that these birds had been feeding in fields at Beam Farm.

The weather was relatively mild, (c.6°C), and it was partially overcast with earlier light showers. The wind was westerly 0-1. Sunset in Slamannan was at 17.18.

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## ANNEX B: OTHER DATA - RARE BIRD ALERT REPORTS OF TAIGA BEAN GEESE ON THE SLAMANNAN PLATEAU DURING WINTER 2012/2013

All reports for Clyde area, (*i.e.*, within North Lanarkshire Council boundaries), during winter 2012/2013

Taiga Bean Goose		Sent: Thu 14-Feb-13, 10:57pm
60	<u>Cumbernauld,</u> <b>(Clyde)</b> refers to : Thu 14-Feb-13	Clyde 60.Taiga Bean Geese SE of Cumbernauld at Easter Fannyside Loch (20.Waxwings Cumbernauld at Grangeneuk Gardens)
Taiga Bean Goose		Sent: Fri 26-Oct-12, 6:23pm
205	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Fri 26-Oct-12 5:40pm	Clyde 205.Taiga Bean Geese 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm at 5.40pm. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Mon 15-Oct-12, 11:45am
240	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Sun 14-Oct-12	Clyde 240+Taiga Bean Geese y'day 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Tue 9-Oct-12, 4:54pm
180	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Tue 9-Oct-12 10:45am	Clyde c180.Taiga Bean Geese 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm at 10.45am. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Mon 8-Oct-12, 7:09pm
170	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Mon 8-Oct-12 6:00pm	Clyde 170+Taiga Bean Geese still 6pm 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Mon 8-Oct-12, 11:44am
172	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Mon 8-Oct-12	Clyde 172.Taiga Bean Geese 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Sun 7-Oct-12, 2:10pm
108	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Sun 7-Oct-12 "In Morning"	Clyde 108.Taiga Bean Geese 1.5mls SE of Fannyside Loch north of B803 in field opposite Luckenburn Farm this morning. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Fri 28-Sep-12, 9:23am
40	<u>Luckenburn,</u> <b>(Clyde)</b> refers to : Thu 27-Sep-12	Clyde 40.Taiga Bean Geese y'day 1.5mls SE of Fannyside Loch by B803 in field at Luckenburn Farm. Park carefully <a href="#">NS.823.723</a>
Taiga Bean Goose		Sent: Wed 26-Sep-12, 10:55pm
40	<u>Fannyside Lochs,</u> <b>(Clyde)</b> refers to : Wed 26-Sep-12 "Dusk"	Clyde 40.Taiga Bean Geese Easter Fannyside Loch at dusk

**All reports for Forth area, (i.e., within Falkirk Council boundaries), during winter 2012/2013**

Taiga Bean Goose		Sent: Thu 13-Dec-12, 11:48am
100	<u>Slamannan,</u> <b>(Forth)</b> refers to : Thu 13-Dec-12	Forth c100.Taiga Bean Geese 2mls NE of Slamannan in fields SW of Loch Ellrig with Pink-footed Geese
Taiga Bean Goose		Sent: Fri 30-Nov-12, 10:44pm
93	<u>Slamannan,</u> <b>(Forth)</b> refers to : Fri 30-Nov-12 "In Afternoon"	Forth 93.Taiga Bean Geese 1/2ml NW of Slamannan in fields at Hillend Farm this a'noon
Taiga Bean Goose		Sent: Tue 13-Nov-12, 2:32pm
158	<u>Falkirk,</u> <b>(Forth)</b> refers to : Tue 13-Nov-12 "In Afternoon"	Forth 158.Taiga Bean Geese 4.5mls SW of Falkirk +just NW of Slamannan this a'noon
Taiga Bean Goose		Sent: Sun 4-Nov-12, 4:57pm
50	<u>Slamannan,</u> <b>(Forth)</b> refers to : Sun 4-Nov-12	Forth c50.Taiga Bean Geese east of Slamannan in fields by Shieldhill road

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