



Breeding success of
Greylag Geese on the
Outer Hebrides, August 2015

Wildfowl & Wetlands Trust Report

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Summary

A total of 2,063 Greylag Geese were aged in the Uists on 21-23 August 2015 and in Harris/Lewis on 23-25 August. In the Uists, 1,244 Greylag Geese were aged and 24.8% were young. The mean brood size of successful pairs was 2.83 young and the majority of broods were of two young. The majority of age samples contained 25% - 30% young. The median flock size was 20 birds, and the majority of flocks contained 11 - 20 birds. In Harris/Lewis, 819 Greylag Geese were aged and 16.8% were young. The mean brood size of successful pairs was 2.65 young and the majority of broods were of three young. The majority of age samples contained 0% - 5% young. The median flock size was 12 birds and the majority of flocks contained 1 - 10 birds. The percentage of young recorded in different habitats varied with the highest values being recorded in rough grassland in both the Uists and Harris/Lewis.

1 Introduction

The status and distribution of the two Greylag Goose *Anser anser* populations that occur in Scotland is changing. The British Greylag Goose population, which is present in Scotland year round, is increasing in abundance and distribution, with breeding now occurring over much of the mainland, Western Isles and Northern Isles (Mitchell *et al.* 2010). Local increases in British Greylag Geese have also led to an increase in reports of damage to agricultural economic interests. In order to manage Greylag Geese in Scotland, up to date information is needed on the abundance, demography (including annual breeding success) and distribution of the geese. This is particularly pertinent in the Uists and Harris/Lewis where Scottish Government and Scottish Natural Heritage (SNH) are undertaking localised trials in order to develop an adaptive approach to managing Greylag Goose abundance and conflict with agricultural economic interests.

In light of the need for demographic data to accompany the management trials, an assessment of annual breeding success was carried out in the Uists and Harris/Lewis in late summer 2015.

2 Methods

An assessment of the breeding success of Greylag Geese in the Uists and Harris/Lewis was undertaken in late August 2015. Greylag Geese within a sample of flocks encountered were aged as either adult or young (identified through plumage characteristics; Figure 1). Adults were characterised by broad, blunt ended, pale tipped coverts on the upper wing, broad feathers on the flank and an ivory coloured tip to the bill. Young Greylag Geese were characterised by narrower, rounded wing coverts lacking the broad pale parallel lines of the adult, a more mottled belly and flanks and often a black nail on the bill tip.



Figure 1. Photographs of adult (left) and young (right) Greylag Geese showing plumage features that determine age in late summer.

Brood sizes of successful pairs were also recorded. Young geese tend to remain with their parents for most of the first winter. Families can be identified on behaviour; two (or rarely one) adult geese are accompanied by young birds, the unit often walking and feeding together.

A car based survey of the islands of South Uist, Benbecula, North Uist and Harris/Lewis was carried out over five days (21-25 August 2015). Greylag Geese that were encountered were either aged from the car, or on foot, using a 20x-60x zoom telescope and a window-mount or tripod. A representative sample of the birds from each island group was made through random encounters of geese. Geese were sampled from all positions within flocks (families are known to frequent the edges of flocks, Owen 1980) wherever possible. Driving from location to location in one broad direction (south to north) minimised the risk of repeat sampling the same flock. The goal was to age a minimum of 10% of the approximate island group populations, i.e. a sample of ~600 Greylag Geese in the Uists and ~400 birds in Harris/Lewis.

3 Results

In the Uists, a total of 1,244 Greylag Geese from 45 flocks were aged from the southern coast of South Uist to Berneray (Figure 2) and the sample contained 24.8% young (Table 1). The mean brood size of successful pairs was 2.83 young (Table 1) and the majority of broods contained two young (Figure 3). The majority of age samples contained 25% - 30% young (Figure 4). The median flock size was 20 birds, and the majority of flocks contained 11 - 20 birds (Figure 5).

In Harris/Lewis, a total of 819 Greylag Geese from 47 flocks were aged from the southern coast of Harris to Ness (Figure 2) and the sample contained 16.8% young (Table 1). The mean brood size of successful pairs was 2.65 young (Table 1) and the majority of broods contained three young (Figure 3). The majority of age samples contained 0% - 5% young (Figure 4). The median flock size was 12 birds, and the majority of flocks contained 1-10 birds (Figure 5).

Table 1. Annual breeding success (percent young) and mean brood size of Greylag Geese aged in the Uists and Harris/Lewis, August 2015.

Area checked	Total aged	Percent young	No. of broods	Mean brood size
Uists	1,244	24.8	72	2.83
Harris/Lewis	819	16.8	40	2.65

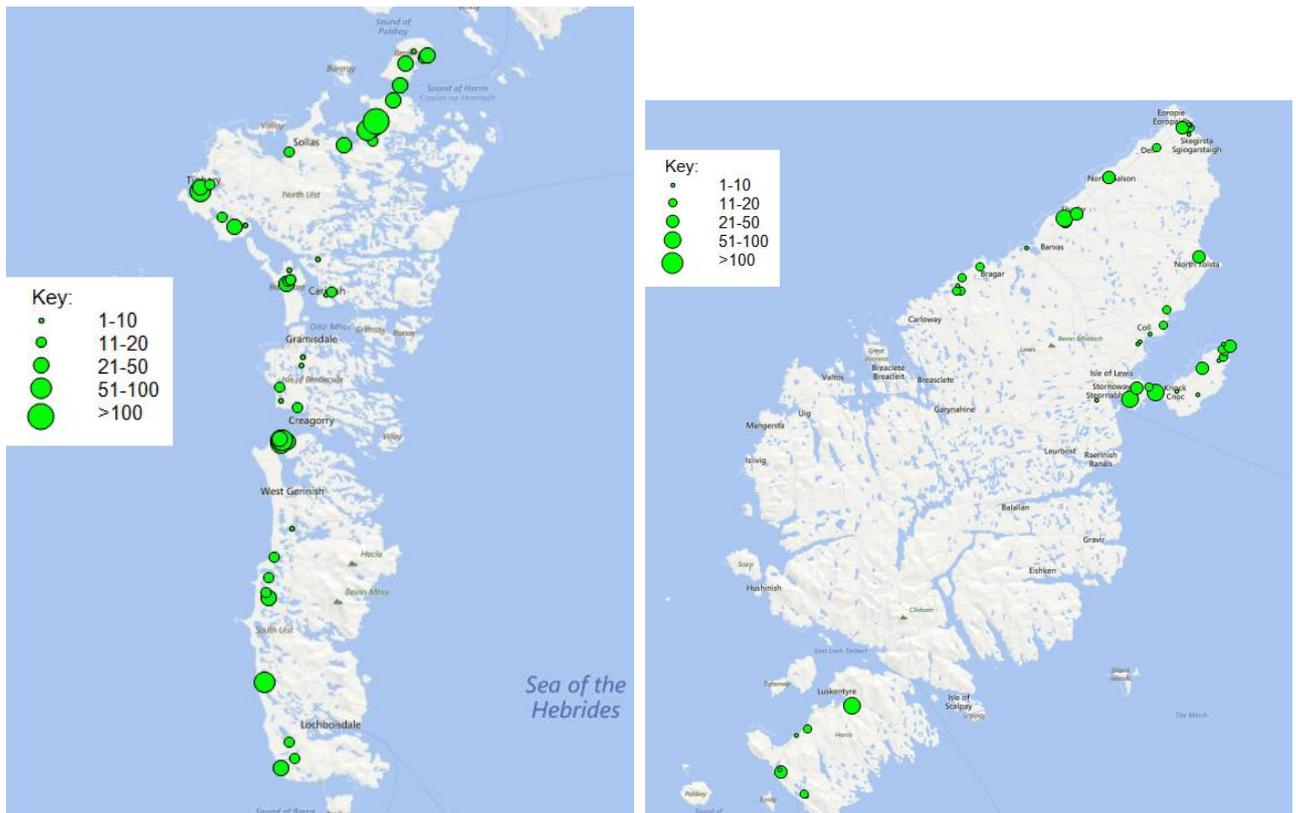


Figure 2. Distribution of Greylag Goose samples used for age assessments in the Uists (left) and in Harris/Lewis (right), 21-25 August 2015.

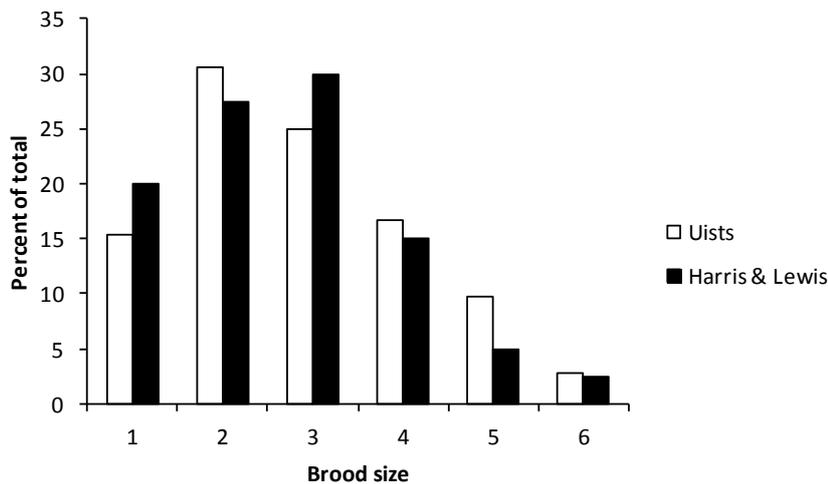


Figure 3. Frequency of brood sizes of Greylag Geese in the Uists and Harris/Lewis in late August 2015 (expressed as the percentage of the total sample for each area).

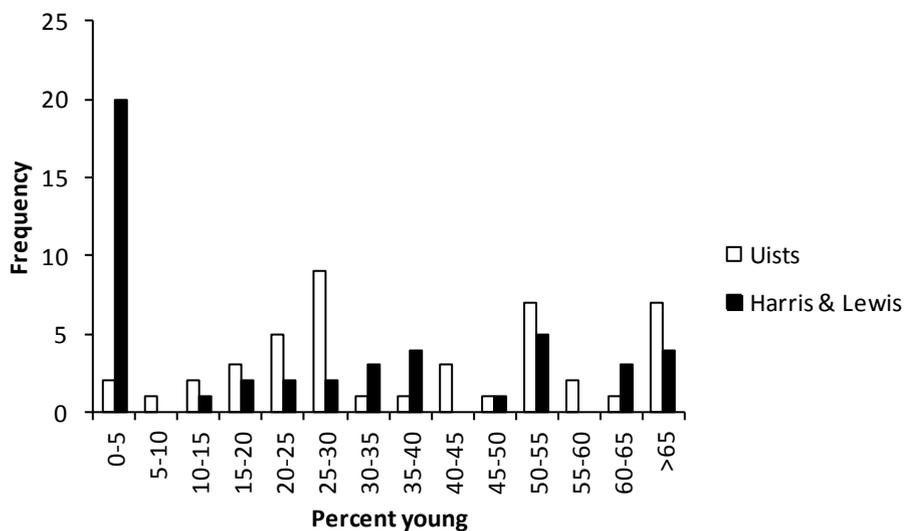


Figure 4. Frequency of values for the percentage of young in samples of Greylag Geese aged in the Uists and Harris/Lewis in late August 2015.

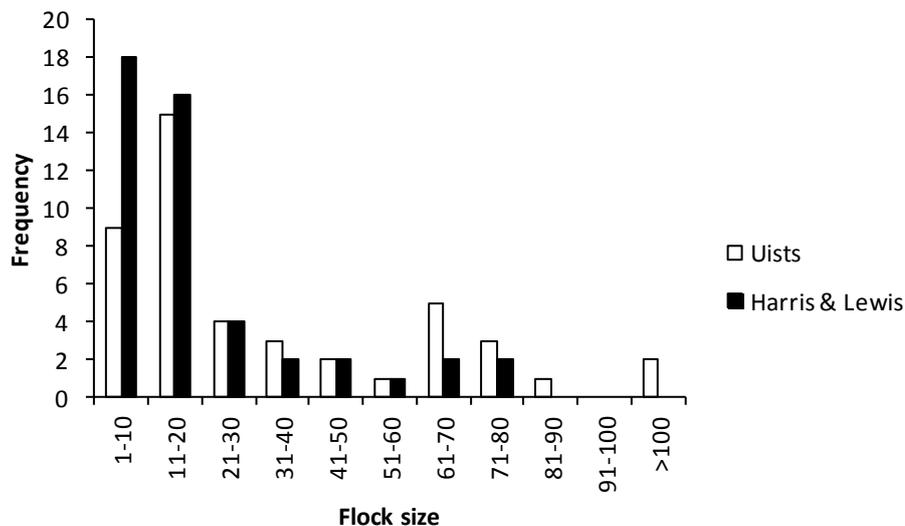


Figure 5. Frequency of flock sizes of Greylag Geese aged in the Uists and Harris/Lewis in late August 2015.

In the Uists, the percentage of young Greylag Geese recorded in sample flocks declined significantly with increasing flock size in the Uists ($F_{40}=10.99$, $P=0.002$, Figure 6).

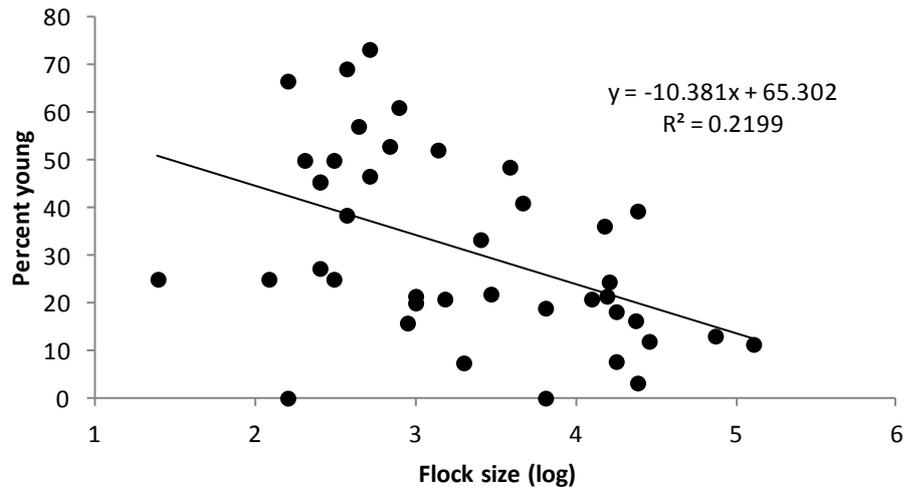


Figure 6. Relationship between percent young and sample flock size of Greylag Geese in the Uists in late August 2015. Flocks comprising a single family only were excluded ($n=4$). Linear trend line fitted.

However, in Harris/Lewis there was no apparent relationship between the percentage of young Greylag Geese recorded in sample flocks and flock size ($F_{36}=0.018$, $P=0.90$, Figure 7). The lack of any relationship was probably affected by the 19 flocks that contained no young.

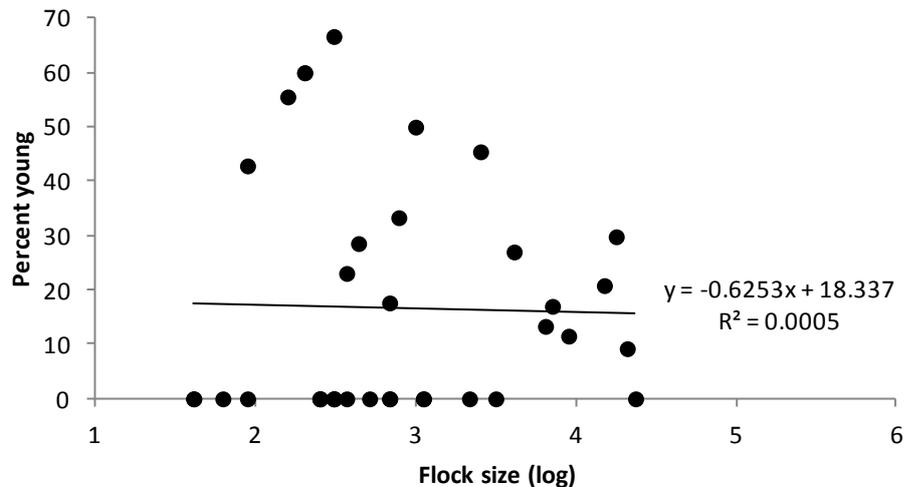


Figure 7. Relationship between percent young and sample flock size of Greylag Geese in the Harris/Lewis in late August 2015. Flocks comprising a single family only were excluded ($n=10$). Linear trend line fitted.

The percentage of young Greylag Geese recorded in sample flocks appeared to vary according to habitat. In the Uists, the highest values were recorded on rough grassland and the lowest on saltmarsh (Figure 8). In Harris/Lewis, differences were less pronounced, although the highest percentage of young was also recorded on rough grassland (Figure 8).

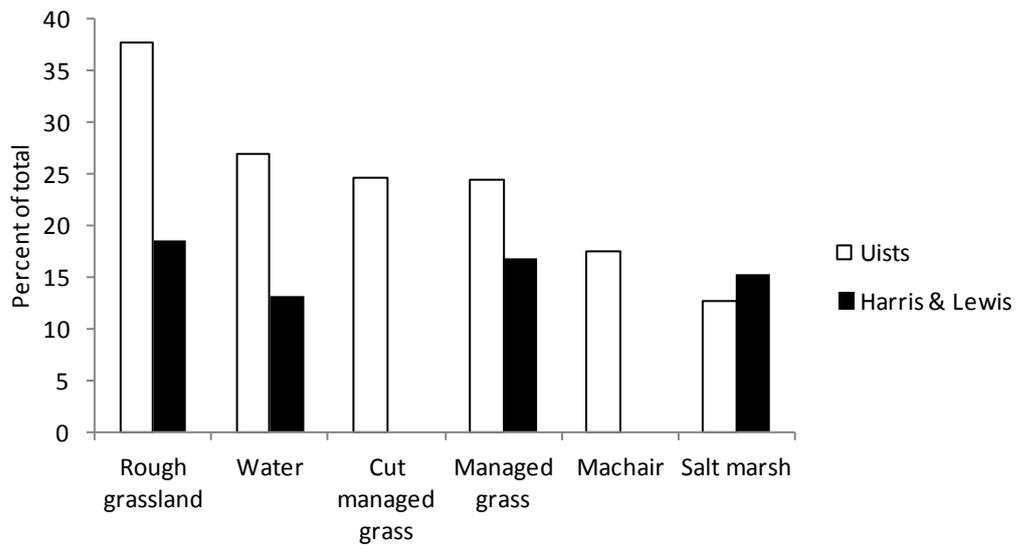


Figure 8. Percent young Greylag Geese recorded in sample flocks on different habitats in the Uists and Harris/Lewis in late August 2015. Based on total counts of >50 birds in each habitat.

All raw data are provided in Appendix 1.

4 Discussion

Breeding success of Greylag Geese recorded in the Uists in August 2015 (24.8% young) was slightly lower than the previous ten year mean (27.8 + 1.00 SE, 2005 to 2014, Figure 8), and the mean brood size (2.65) was also slightly lower than previous ten year mean (2.92 + 0.16 SE, 2005 to 2014, Figure 8).

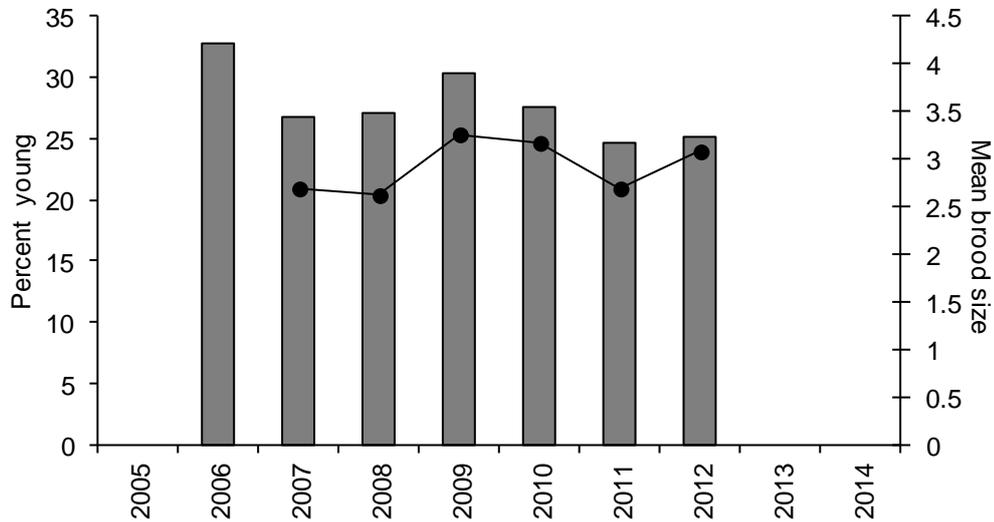


Figure 8. Annual breeding success of Greylag Geese (percent young) and mean brood size of successful families recorded in the Uists from 2005 to 2014. No breeding success data were collected in 2005, 2013 and 2014.

It is believed that data collected in August 2015 was the first attempt at assessing annual breeding success of Greylag Geese in Harris/Lewis, so it was not possible to compare the 2015 value with previous figures. However, the overall percentage of young in 2015 was 8% lower than in the Uists.

By way of comparison with the two other areas where SNH are carrying out management trials, in late August 2015, the breeding success recorded in Tiree (Inner Hebrides) was 29.7% young (Figure 9), with a mean brood size of 2.54 (n=186 broods) and in Orkney, the percentage of young was 27.0% (Figure 9), with a mean brood size of 3.38 (n=37 broods).

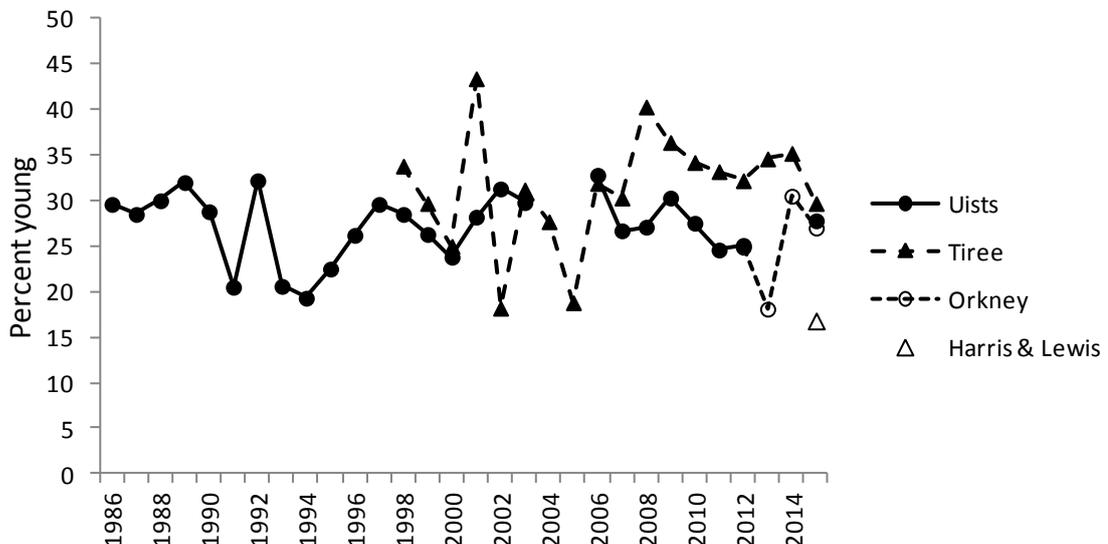


Figure 9. Annual breeding success of Greylag Geese (percent young) recorded in the Uists (1986-2015), Tiree (1988-2015) Orkney (2012-2015) and Harris/Lewis (2015).

5 Recommendations for future monitoring

An annual assessment of productivity can be undertaken at the same time that post breeding monitoring of abundance is carried out, ideally during the last two weeks of August. However, once the wildfowl hunting season begins (1 September), the geese become more wary and are harder to approach, so recording age ratio data before that date is desirable.

Collecting as large a sample size as is practicable is desirable and a goal of at least 5% of the total population is suggested. Age counts should be undertaken from a wide range of locations to sample flocks comprising successful breeding pairs and non-breeding aggregations. Samples should also be obtained from a wide range of habitats if possible. Brood sizes should also be obtained wherever practicable.

Under excellent counting conditions in late August 2015, sample sizes of 1,244 and 819 birds aged on the Uists and Harris/Lewis respectively, were obtained in two full fieldwork days in each island group. This represented approximately ~20% of the late summer 2015 Uist population (6,188 birds, SNH data) and ~22% of the late summer 2015 Harris/Lewis population (3,794 birds, SNH data). The number of fieldwork days can be adjusted to suit budgets, although two days for each island group is probably a minimum requirement. In addition, allowance must be made for poor weather during the sampling period. For example, a day of fieldwork can easily be lost due to strong winds and driving rain. Thus, an extra day (five days fieldwork in all) for such an eventuality is recommended.

In 2015, a fieldworker based in north central Scotland undertook the age counts. The costs of travel to and from the Outer Hebrides (ferry and fuel) were likely to be in addition to the costs charged by a local contractor. However, training a local member of SNH staff or a local ornithologist to undertake the age assessments could be considered. This would allow flexibility in the timing of age assessments due to weather conditions and could be something that SNH consider going forwards.

6 Acknowledgements

Thanks go to Richard Hearn (WWT) and Roddy MacMinn (SNH) for comments on an earlier draft of this report.

7 References

Mitchell, C., L. Griffin, M. Trinder, J. Newth & C. Urquhart. 2010. The status and distribution of summering Greylag Geese in Scotland, 2008/09. *Bird Study* 58: 338-348.

Owen, M. 1980. *Wild geese of the world*. Batsford, London.

8 Appendix 1. Raw data

Uists	Grid reference	Habitat	Flock size	Number aged	Number of young	Brood sizes						
						7	6	5	4	3	2	1
22/08/2015	NF742154	RG	60	24	5							
22/08/2015	NF756163	RG	11	11	3					1		
22/08/2015	NF751178	RG	11	11	5					1	1	
22/08/2015	NF732238	cut MG	70	52	4					1		1
22/08/2015	NF743318	RG	24	24	5				1			1
22/08/2015	NF740323	cut MG	15	15	7				1		1	1
22/08/2015	NF744337	MO	20	20	4						2	
22/08/2015	NF751357	cut MG	13	13	9		1			1		
22/08/2015	NF770382	MG	10	8	4						1	
21/08/2015	NF766465	SM	80	63	2						1	
21/08/2015	NF773466	RG	39	39	16			1		3	1	
21/08/2015	NF766468	SM	86	67	8							
21/08/2015	NF768468	SM	130	92	12			1		1	1	
22/08/2015	NF765469	cut MG	65	47	17							
21/08/2015	NF785498	RG	18	18	11					1	1	
23/08/2015	NF769505	cut MG	9	9	0							
23/08/2015	NF769518	cut MG	12	12	3							
23/08/2015	NF792537	RG	4	4	1							1
23/08/2015	NF793545	WA	4	4	2						1	
23/08/2015	NF820603	road	6	6	4				1			
23/08/2015	NF626605	MO	15	15	11		1	1				
23/08/2015	NF784616	MA	27	27	2							2
21/08/2015	NF785618	MA	20	14	3					1		
23/08/2015	NF788619	RG	17	17	9			1				
21/08/2015	NF788620	RG	14	14	8				1		2	
23/08/2015	NF787629	SM	6	6	4				1			
21/08/2015	NF815637	MO	6	6	4				1			
21/08/2015	NF738674	MG	45	37	7						1	
23/08/2015	NF749675	MG	8	8	2						1	
21/08/2015	NF728684	MG	30	15	5					1	1	
21/08/2015	NF709710	MG	70	55	10				1		1	
21/08/2015	NF709714	WA	36	35	17			1		1		
23/08/2015	NF719716	cut MG	12	12	6			1				1
21/08/2015	NF796740	MG	11	11	5					1	1	
21/08/2015	NF848743	SM	32	32	7				1		1	1
21/08/2015	NF875745	WA	19	19	3						1	1
21/08/2015	NF878756	RG	66	28	6			1				1
23/08/2015	NF871756	cut MG	80	61	24					2		
23/08/2015	NF880763	cut MG	165	115	13						2	
21/08/2015	NF897782	WA	23	23	12				3			
23/08/2015	NF905795	WA	45	45	0							
23/08/2015	NF912815	MG	67	45	11				1			1

	Grid reference	Habitat	Flock size	Number aged	Number of young	Brood sizes			
23/08/2015	NF929819	MA	13	13	5			1	1
23/08/2015	NF933822	MA	79	43	7				
23/08/2015	NF921827	RG	9	9	6			2	
Harris/Lewis									
23/08/2015	NG022865	RG	3	3	1				1
23/08/2015	NG020868	WA	17	17	3			1	
23/08/2015	NF993896	MG	30	22	10			3	1
23/08/2015	NF993899	SM	7	7	3			1	
23/08/2015	NG015939	MA	4	4	2				1
23/08/2015	NG029946	MG	11	11	0				
23/08/2015	NG085970	SM	52	52	6		1		1
24/08/2015	NB444317	MG	75	65	6				2
24/08/2015	NB524317	RG	7	7	0				
25/08/2015	NB403318	WA	12	7	0				
24/08/2015	NB474323	MG	79	58	0				
24/08/2015	NB500323	football pitch	6	6	0				
25/08/2015	NB467330	RG	20	12	6			1	
25/08/2015	NB452330	RG	47	47	8		1		
24/08/2015	NB532348	RG	45	45	6		1		1
24/08/2015	NB552356	RG	3	3	1			1	
24/08/2015	NB558360	WA	17	17	0				
24/08/2015	NB560367	RG	14	14	4				1
24/08/2015	NB557370	RG	12	12	0				
24/08/2015	NB569372	RG	6	6	4		1		
24/08/2015	NB566373	WA	65	24	5			1	1
24/08/2015	NB559376	RG	2	2	0				
24/08/2015	NB457383	MG	8	3	3				1 1
24/08/2015	NB460385	MG	4	4	2				
24/08/2015	NB472393	RG	9	9	5			1	1
24/08/2015	NB489403	RG	12	12	0				
24/08/2015	NB494421	cut MG	17	17	0				
25/08/2015	NB251460	WA	11	11	0				
25/08/2015	NB246460	RG	11	11	0				
25/08/2015	NB248467	RG	10	10	6			2	
25/08/2015	NB253475	WA	13	13	0				
24/08/2015	NB538479	MG	4	4	2				1
24/08/2015	NB536482	RG	33	33	0				
25/08/2015	NB276487	WA	12	12	8		1		1
25/08/2015	NB332506	RG	10	10	6			1	1
24/08/2015	NB381535	RG	21	21	0				
24/08/2015	NB380538	MG	70	57	17		1	1	1
24/08/2015	NB394543	WA	21	21	0			1	
24/08/2015	NB436583	MO	37	37	10				
24/08/2015	NB495615	MG	18	18	6				1 1
24/08/2015	NB534629	MG	6	6	4			1	

Annual productivity of Greylag Geese on the Outer Hebrides, August 2015

	Grid reference	Habitat	Flock size	Number aged	Number of young	Brood sizes						
24/08/2015	NB533635	RG	13	13	3					1		
24/08/2015	NB535636	MG	15	15	0							
24/08/2015	NB526637	MG	28	28	0							
24/08/2015	NB536639	MG	3	3	1							1
24/08/2015	NB536640	MG	5	5	0							
24/08/2015	NB534641	MG	5	5	0							

Key to habitat codes:

RG – rough grassland, MG – managed grass, MO – (heather dominated) moorland, WA – water, SM – salt marsh, MA – machair.