

# REPORT OF THE 2013/2014 INTERNATIONAL CENSUS OF GREENLAND WHITE-FRONTED GEESE

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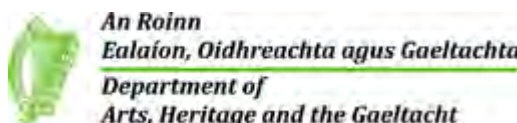
GREENLAND WHITE-FRONTED GOOSE STUDY



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## SUMMARY

**The global population of Greenland White-fronted Geese in spring 2014 comprised 20,797 individuals, down from 22,156 the previous year (a 6.1% decrease). Half of the decline occurred at Wexford, the remainder of the decline split equally between Islay and the rest of Britain; 10,622 were counted in Ireland, 10,175 were counted in Britain. Reproductive success was very low at only 6.9% in Ireland, but 14.2% in Britain.**

*This report presents the results of the surveys of the Greenland White-fronted Goose on the wintering grounds in winter 2013/14, combining counts from all the British resorts (coordinated by the Greenland White-fronted Goose Study) and those in Ireland (co-ordinated by the National Parks and Wildlife Service). The international coordinated count in spring 2014 found a combined global total of 20,797 Greenland White-fronted Geese, the lowest recorded since spring 1985 and down 6.1% (1,359 birds) on the last world population estimate of 22,156 in spring 2013.*

*Very good coverage was again achieved in Ireland in spring 2014 which provided 8,110 from Wexford (compared to 8,751 in spring 2013) and 2,512 (i.e. very slightly up on last year compared with 2,465 in spring 2013) from the rest of Ireland. Missing spring counts were substituted for 12 Irish regular wintering resorts, amounting to 4.4% of the Irish total of 10,622 birds. Complete censuses of all known Greenland White-fronted Goose wintering haunts in Britain found totals of 10,949 birds in autumn 2013 and 10,175 in spring 2014, compared with 10,089 and 10,940 respectively reported in the previous season at the same times of year. The 2013/2014 totals comprised 5 birds reported in England, 37 and 33 in Wales, 5,869 and 5,093 on Islay (compared to 5,321 and 5,449 respectively last season) and 5,038 and 5,044 in the rest of Scotland in autumn and spring respectively (compared with 4,702 and 5,424 respectively last season). Coverage in Britain was more or less complete, all resorts were counted at least once in the season, excluding the Small Isles (where there no longer seem to be regularly wintering geese). Spring counts were missing from the specified count period from 8 resorts, but all were substituted with counts undertaken very close to the defined international count dates, amounting to 6.7% of the British total.*

*Breeding success amongst geese wintering at British resorts was actually reasonable compared to many recent years, especially on Islay. After the 2013 breeding season, the average percentage young was encouragingly 14.2% ( $n = 6,833$  aged, compared to 9.6% last season), mean brood size was 2.88 ( $n = 245$  broods, compared to 2.94 last season). This included an unusually high 17.0% on Islay, (actually above the average of 14.0% for 1962-2012 inclusive) where the mean brood size was 3.28 ( $n = 98$  compared to 3.01 last year). The percentage of first winter birds exceeded 10% at 14 out of 24 sites from which age ratio data were received, better than for several years. In Ireland, the percentage young amongst aged flocks in 2013/14 was lower, 6.9% (based on 5,378 aged individuals) compared to 5.7% last season. Mean brood size amongst the Irish flocks was 2.88 ( $n = 101$ ) compared to 2.94 last season. There were 6.8% young amongst 4,964 aged at Wexford (amongst the lowest on record, but up on 4.9% last year), where the mean brood size was 2.90 (compared to 2.63 last season) based on 93 broods. Elsewhere in Ireland, reproductive success was again modestly better at 8.5% ( $n = 414$ ), but brood size lower (available only from the Midland Lakes) at 2.63 ( $n = 8$ ).*

## INTRODUCTION

The 2013/2014 survey marks the thirty-second annual census of Greenland White-fronted Geese co-ordinated in Great Britain by the Greenland White-fronted Goose Study and in Northern Ireland and the Republic of Ireland co-ordinated by the National Parks and Wildlife Service. Table 1 shows the most recent six seasons of total census data available to the present. Unfortunately, we have no counts from southern Norway, where we think that very small numbers may regularly winter, but otherwise the spring 2014 count represents a full survey of all known winter haunts for this population.

*Table 1. Spring population census totals for Greenland White-fronted Geese, 2009-2014.*

	Spring 2009	Spring 2010	Spring 2011	Spring 2012	Spring 2013	Spring 2014
<i>Wexford</i>	8034	8381	9733	9567	8751	8110
<i>Rest of Ireland</i>	2623	2622	2777	2675	2465	2512
<i>Islay</i>	6429	5744	6911	4309	5449	5093
<i>Rest of Britain</i>	6076	6097	6344	5852	5491	5082
<i>Population total</i>	<b>23162</b>	<b>22844</b>	<b>25765</b>	<b>22403</b>	<b>22156</b>	<b>20797</b>

## AUTUMN ARRIVAL PATTERNS

Although single Greenland White-fronted Geese apparently summered at Barrapol (Tiree) and on Lewis during 2013, the very first 18 Greenland White-fronted Geese reported back on the wintering grounds were seen at Wexford Slobs on 28 September, joined by 2 more on 7 October and 200+ on 9 October 2013. Numbers had risen to 450 by 10 October (AJW).

First reports of Greenland White-fronted Geese back on Scottish wintering resorts was a party of 4 at Moine Mhor on 29 September (David Jardine), with a single reported from Otterwick, Shetland with 3 Pink-footed Geese on 30 September. A family of two adults and three juveniles were reported on Benbecula on 6 October (Steve Duffield), 2 were associating with roosting Pink-footed Geese at Lintrathan Loch, Angus on 8 October and 2 were seen flying over the Ross of Mull towards Fiddon on 9 October. James Howe on Islay counted 300 Greenland White-fronted Geese at Loch Gruinart, Islay, newly arrived back on 9 October. There were 23 geese back at Loch a'Phuill, Tiree on 10 October, and numbers there had risen to 154 based on a whole island count on 14/15 October (John Bowler). Arthur Thirlwell reported 32 (no young) back at Finnierness, Loch Ken on 12 October, including collared individuals V0F, V4F, V6F and V9F. Numbers there had risen to 34 by 15 October, 55 the next day and 56 on 17 October when V9C was also amongst their number (Eric Patrick).

Sixteen Greenland White-fronted Geese were reported back at Loch Lomond on 13 October, rising to 89 by 24 October, 140 by 31 October, 150 by 10 November, 195 by 17 November and 205 on 30 November (Clydebirds). Donald Omand saw 25 back at Hallam (Westfield flock Caithness) and their numbers had risen to 160 by 24 October (Julian Smith). Gavin Chambers reported 74 Greenland White-fronted Geese back at West Freugh, Stranraer on 14 October, including 13 first winter birds. Two were reported on South Uist on 15 October and a single bird was reported at Loch Branahue, Lewis next day (per Steve Duffield). Thirteen

flew over Boisdale 11 October, one was seen at Loch Branahuie on Lewis on 16 October and there were 24 flying over Askernish on 22 October, with 22 flying south over the Treshnish Islands on 24 October. David Jardine also had 2 back on Colonsay on 19 October. Four were seen on North Ronaldsay, Orkney on 25 October, with at least one remaining throughout November. Michael Sherman saw his first 12 on the Dyfi Estuary on 25 October, where numbers had risen to 37 by 16 November. Twenty three Greenland White-fronted Geese flew south-east over Carinish, North Uist on 28 October. The Endrick Mouth flock at Loch Lomond where 6 were first seen on 13 and 14 October, had built to 89 by 24 October and to 140 by 30 October (Clydebirds).

The first Whitefronts were reported back on Mull were on 26 October at Fidden, Mull, where numbers reached 23 by 1 November (Bryan Rains). Orkney Bird Report reported 49 of the Loons flock back on 26 October, where Alan Leitch had 50 on 29 October. What was described as an unprecedented 17 Greenland White-fronted Geese (including at least one bird of the year) turned up at Cockersand on the Lune Estuary in Lancashire on at least 27 October and remained for some days. An adult with four young turned up at Musselborough Lothian around 30 October and a single was seen with c.800 Pink-footed Geese at Rockcliffe Marsh on 1 November. One turned up on Rockcliffe Marshes (Cumbria) on 1 November and probably the same bird was seen at Kirkbride on 5 November. A single Greenland White-fronted Goose was back at Loch Caroy on Skye on 3 November with Greylags, the flock at Kilmuir numbering 20 on 25 November (Bob McMillan). Four were seen on Bardsey Island, Gwynedd on 4 November. Richard Brown, warden on Skokholm, Pembrokeshire heard and then saw a Greenland White-fronted Goose flying over his house on the island at 08.30 on 10 November. He was quick enough to squeeze off a series of photographs sufficient to show the bird was bearing an orange collar and white plastic tarsus band that confirmed it was a Greenland bird, but alas not clear enough to read the code!! The bird was heading straight out west for Ireland and presumably Wexford, a mere 100 km away as the goose flies. There was a single Greenland White-fronted Goose at Burnham Market, Norfolk, with 4000 Pink-footed Geese on 12 and 13 November. Four to five Greenland White-fronted Geese frequented south Mainland Shetland during 17-19 November.

## **SPRING DEPARTURE PATTERNS**

Ed Burrell and Malcolm Ogilvie noted the earliest departures from Islay taking place on 2 April, but overall, few had gone before 4 April. That weekend the wind swung round to the south and by 7 April more than 50% of the geese on Ed's beat had gone, although many flocks remained intact after that and the tagged GSM logger bird did not leave until 11 April. At Loch Ken, Arthur Thirlwell had a full complement of 130 on 23 March, falling to 105 on 30 March (Larry Griffin) but Arthur found only 11 (including one collared bird, V6A) on 5 April and all were gone by 8 April. David Jardine had 57 at Appin on 4 April, falling to 9 on 14 April (Alan Reid) when 100 were still present just across the water on Lismore. Donald and Alison Omand saw their last 6 birds flying NW down Achiebaeskiall Strath, Caithness on 5 April. The Dyfi flock still numbered 33 on April 10 (Russ Jones), and although most geese had left Tiree on 15 April, 6 persisted until 21 April there (John Bowler). Mary Legg and Karen Munro reported a singleton remaining at Loch of Mey Caithness until at least 2 May.

There were unusually few reported signs of major passage on the Western Isles this year. Steve Duffield's web site reported 34 and 25 that later flew north from Carnish and there were 35 that came in from the NW to Loch Hougarry (all 1 April), 15 on 5 April, 60 north on 14 April, when there were 9 at Loch Nam Feithean and there were resting flocks of 26 (Claddach Kirkibost 12 April remaining to the next day), 15 (5 April), were the only reports, all from North Uist (Brian Rabbitts).

Hlynur Óskarsson saw the first 11 Greenland White-fronted Geese at Hvanneyri early on the morning of 25 March, with numbers increasing there to 213 by the same evening, including two collared birds from Wexford, both of which were at Hvanneyri last autumn. By 28 March Jón Jónsson was seeing 12 and c.30 flying in towards Hvanneyri at Andrakilsá and in southern Iceland, Jóhann Óli Hilmarsson counted 78 in Floí on the south coast on a regularly counted transect between Villingaholt and Fljótshólar, where Hlynur had counted none two days earlier. Numbers built quickly in the southern lowlands as well, with Jóhann-Óli Hilmarsson counting 256 at Þykkvibær on 30 March. This arrival date is the earliest reported from Iceland in spring, beating last years' record in Floí by four days.

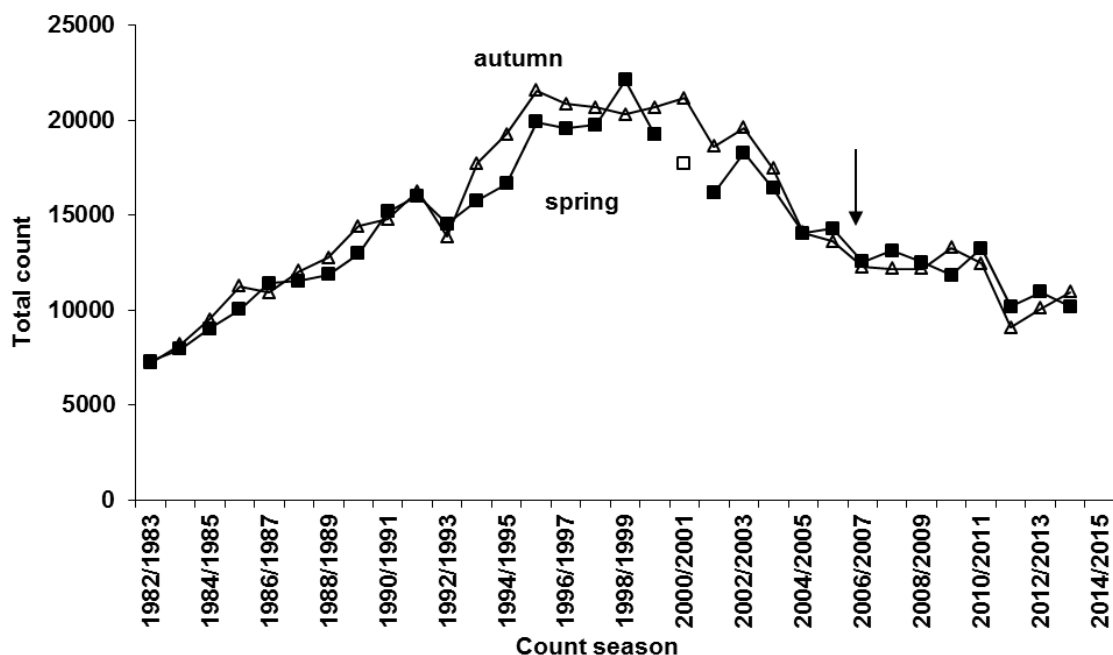
## COUNTS IN BRITAIN

Extremely good coverage of all known regular Greenland White-fronted Goose wintering sites was achieved in Britain during winter 2013/14. As usual, no data have been incorporated from the WeBS database, as these counts were not available at the time of writing. As well the fantastically loyal coverage achieved by the count network, we have gathered reports from the internet on other observations of the race. After the large numbers reported away from regularly used sites during 2011/12, we seem to have slipped back to the situation in most other years where there were very few reports away from the traditional wintering haunts. A full breakdown of the count totals giving the maximum counts per month and the census period totals is presented in Table 2 and the long terms trends in autumn and spring counts since 1982/83 in Britain in Figure 1.

Between 67 and 91 Greenland White-fronted Geese were reported from around The Loons on Orkney, with reports 2 birds on Westray and a single that lingered throughout the year on North Ronaldsay. Numbers at both wintering flocks in Caithness were back up to the levels of winter 2011/12, with up to 160 at Westfield (110 the previous spring) and up to 157 in the Loch of Mey/Loch Heilen (compared to 151 last season). The Lewis flock numbered 34 geese (compared to 38 last year), while the two Uist flocks showed slightly different patterns: 142 counted at Loch Bee were substantially up on numbers in the last two years (i.e. 113 last year and 102 the previous season), but a disappointing 21-24 regularly counted at Kilpheder compared to 36 in 2012/13 and 19 in 2011/12. Disappointingly, no regular numbers were reported from Benbecula where 17 and 26 had been regular in the previous two seasons. The two Skye flocks continued to just survive; the flock using Broadford and local adjacent islands continues to prove very difficult to survey but held 14 birds at most slightly up on last season. Numbers at the two flocks at Loch Shiel/Kentra Moss and Appin/Benderlock supported slightly more geese than last year, while numbers on Lismore, Tiree and Coll were all slightly lower than last season. Numbers on Colonsay and Lowlandman's Bay Jura were up

on last year as were those at Keills/Danna/Ulva (albeit slightly), but the tiny Moine Mhor flock that seems just to hold on every year fell back in 2013/14 to 11 geese from 16 last winter. Total numbers of Greenland White-fronted Geese wintering on Kintyre dropped to a little over 2,100 after a couple of winters exceeding 2,400 in all, but perhaps the increased dispersal of these geese are making them more difficult to count annually. Encouragingly, numbers of Bute were regularly reaching 190 again after dropping to c.160 last winter. Numbers at Loch Lomond exceeded 200 on several occasions during the winter (as in the previous year) but only 176 could be found during the nominated count dates.

The monthly counts on Islay returned over 5,000 White-fronted Geese throughout winter 2013/14, but only 5,093 could be accounted for in the international spring coordinated count, down on 5,449 in spring 2013 despite the very high proportions of first winter birds in the flocks there. This difference between the spring counts in successive years is the main reason for the overall fall in the British totals in spring 2014 compared to that in the foregoing year. Loch Ken numbers were consistently lower in 2013/14 than they had been in 2012/13 and the proportions of young in the flock were also disappointing after the otherwise apparently good 2013 breeding season reflected in percentage young at flocks elsewhere. Numbers at Stranraer were slightly up on the previous season, whilst Dyfi numbers dropped back sharply to just 33 after 55 present in 2012/13. Due to difficulties in locating birds, bad weather and incomplete counts, we have had to substitute counts at eight wintering resorts for counts missing during the international spring census count period. These counts were taken from those sites on dates close to the spring count dates and constituted 6.7% of the British count total (shown shaded in grey in Table 2).



**Figure 1.** Counts of Greenland White-fronted Geese in Britain, 1982/1983-2013/2014, showing autumn (open triangles) and spring (filled squares) census results for each season. The value for spring 2001 (unfilled square) was missing on account of the outbreak of Foot and Mouth Disease that year and was therefore estimated from previous counts. Vertical arrow indicates start of hunting ban in Iceland in autumn 2006.

**Table 2. Summary counts of Greenland White-fronted Geese in Britain 2013/14.**

*shaded values are estimates for sites where no counts were received for the precise period of the international census periods*

SITE NAME	SEP	OCT	NOV	AUTUMN CENSUS	DEC	JAN	FEB	MAR	SPRING CENSUS	APR
<b>ORKNEY</b>										
Loons		50	67	67	30	73	91	73	91	
Westray			2	2						
Stenness										
North Ronaldsay		4	1	1	1	1	1	1	1	
<b>CAITHNESS</b>										
Westfield		160	136	160	160	114	80		160	
Loch of Mey		90	148	140	140	150	146	163	157	
Loch of Winless										
<b>NE SCOTLAND</b>										
Loch of Strathbeg		1	1					2		
<b>WESTERN ISLES</b>										
Barvas/Shawbost, Lewis				34	34		34		34	
Loch Branahue Lewis		1						1	1	
North Uist			2	2	2	2	2	1	1	
Kilpheder/Askernish, South Uist		24	21	21	21	24	23	23	23	
Loch Bee/Kilaulay, South Uist			151	151		142	101		142	
<b>INNER HEBRIDES</b>										
Loch Chialum Chille, Skye			20	20	20	20	20		20	
Broadford/Pabay, Skye				6	6		14		14	
Plockton, Lochalsh										
<b>LOCHABER/NORTH ARGYLL</b>										
Muck/Eigg										
Loch Shiel/Claish Moss				28	28				28	
Lorn: Kintaline				93			88			
Lorn:Eriska/Benderloch				60					88	
Lorn: Appin			59	60	60	59	62	57	57	57
Lismore		200	150	160	124	90	210	193	186	180
Tiree		154	718	658	658	721	772	739	739	
Coll			302	136	136	145	207	154	154	
Fiddon, Mull		23	31	32	32	29		33	33	
Assapol, Mull				0	0		4			
<b>SOUTH ARGYLL</b>										
Colonsay/Oronsay		59	99	99	69	50	5	86	86	
Jura: Loch a'Chnuic Bhric									6	
Jura: Lowlandman's Bay			19	12	0	0	0	12	12	
Danna/Kiells/Ulva		196	192	112		123	190	201	199	
Moine Mhor	4	11	11	11	11	11	11	11	11	
Rhunahaorine			833	561					577	
Machrihanish			1317	1617					1231	
Clachan			163	75					162	
Gigha				92					111	
Glenbarr				3					40	
Isle of Bute			190	190			120		190	190
Endrick Mouth, Loch Lomond		140	205	205	180	196	237	210	176	
<b>ISLAY</b>			5888	5869	5955	5329		5272	5093	
<b>DUMFRIES &amp; GALLOWAY</b>										
Loch Ken		47	109	128	97	144	135	143	123	11
Stranraer		123	180	102		187	171	191	191	
<b>IRREGULAR SCOTTISH SITES</b>										
Total			5				2	1		
<b>WALES</b>										
Dyfi Estuary		12	37	37	33	37	35	33	33	33
<b>ENGLAND</b>										
Grindon Lough		2	2	2	2	2	2	2	2	
Woodhorn, Northumberland			2	3	3	3	3	3	3	
Lancs Mosses										
Irregular sites			5		5	4	3	1		
<b>TOTALS</b>		<b>1297</b>	<b>11066</b>	<b>10949</b>	<b>7807</b>	<b>7656</b>	<b>2769</b>	<b>7606</b>	<b>10175</b>	<b>471</b>
<b>Rest of GB less Islay</b>		1297	5178	5080	1852	2327	2769	2334	5082	471
<b>Rest of Scotland less Islay</b>				5038					5044	
<b>England</b>				5					5	
<b>Wales</b>				37					33	

## COUNTS FROM IRELAND

Thanks to very good coverage again in Ireland, almost all known flocks were surveyed and counted at least once in the course of the winter, especially for the larger groups (see Table 3 for full details). No counts were reported from the Killarney Valley in the extreme south west, although signs of goose activity were found at feeding sites in February, so last year's numbers were inserted for this site (7 birds). Furthermore, there were signs of goose activity reported from North Lough Ree in the Shannon but no geese were seen or counted there during the winter, where in this case we have not substituted a count. Regular count coverage in 2013/14 confirmed the absence of geese at Caledon again and none were located at Lough Oughter suggesting that this site may have been deserted.

At twelve other sites, missing counts or failure to find geese when they were known to be present during the spring international count period meant that we have substituted counts from dates outside the spring international count period at eleven sites. These were Lough Conn (30 birds), two Bog of Erris sites (total 15), Errif and Derrycraff (43), Connemara (7), Rostaff and Killower (97), Lower Lough Corrib (where seven were seen in autumn and the geese proved difficult to find the rest of the winter, but last year's spring count of 23 was entered for spring 2014), Rahasane (58), Tullagher (13), North County Clare (44), Little Brosna (135) and Killarney (see above, 7) and these estimates amount to 4.4% of the total Irish population. The flock at Errif and Derrycraff that could not be found at all in 2011/12 reached 43 geese this season. Although 7 Greenland White-fronted Geese were seen there during the autumn survey, counts at Lower Lough Corrib (which held up to 30 individuals in 2012/13) found no geese at this resort subsequently in winter 2013/14. Comparisons with 2012/13 largely suggested declines across many resorts. Some sites (mainly in the north) showed modest increase, including Loughs Foyle and Swilly (1032 to 1220), Pettigo (54 to 63) and Stabannan (32 to 45) while cheerily, the combined total for the Bog of Erris seemed to consistently remain above 40 birds. Rostaff and Killower (84 to 97) and geese in the Lough Gara area also increased a little (114 to 122). Generally however, the picture was one of stable numbers or declines, perhaps most worrying in the Shannon, where numbers dropped back on the Suck (196 to 133) and Little Brosna (176 to 135) in 2013/14 compared to last winter.

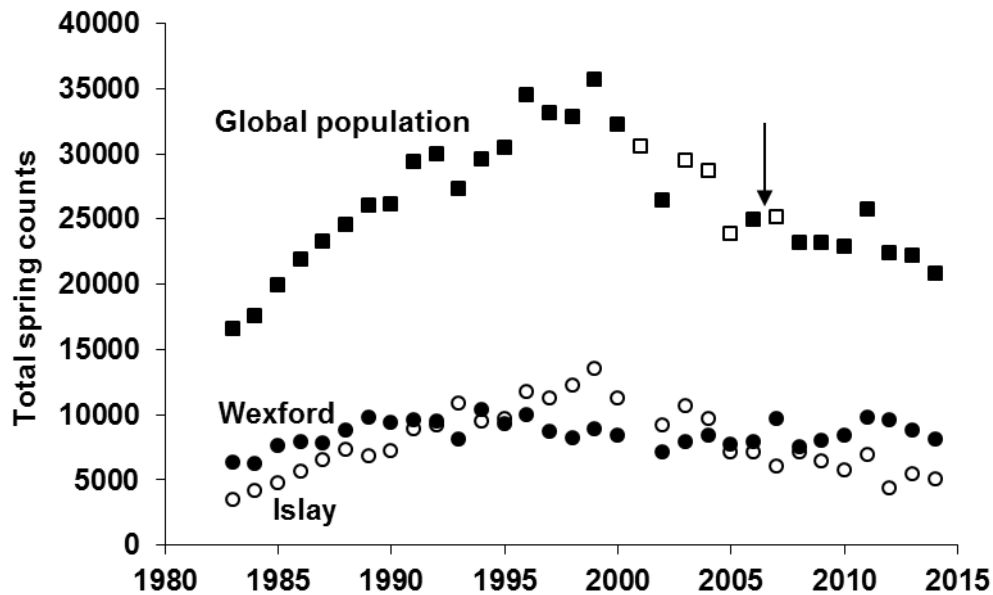
The spring 2014 Wexford count was 8,110, down on the 8,751 counted in spring 2013, after a series of years when numbers held up better at this, the most numerically important resort in Ireland for the population, than at resorts elsewhere in Ireland. Wexford has consistently shown poor reproductive success amongst its wintering birds and Mitch Weegman's study continues to suggest that Wexford numbers in previous years must have been inflated by immigration coming from other flocks to sustain such totals. The recent downturn in numbers here may suggest that declines in flock numbers elsewhere are now also beginning to affect these movements to Wexford.

**Table 3. Summary counts of Greenland White-fronted Geese in Ireland 2013/14.**

*shaded values are estimates for sites where no counts were received for the precise period of the international count periods*

	OCT	NOV	AUTUMN CENSUS	DEC	JAN	FEB	MAR	SPRING CENSUS	APR
<b>DONEGAL</b>									
1.Loughs Foyle & Swilly		1008	1008	694	398	919	1220	1220	
2.Dunfanaghy		0	44	0	0	44	91	91	
3.Sheskinmore lough	14	42	42	21	21	17	37	37	
4.Pettigo	49	40	53	53	57	40	63	63	
<b>NORTH CENTRAL</b>									
6.Lough Macnean	24	49	61	61	63	62	64	64	
7.Lough Oughter		0	0	0	0	0	0	0	
8.Caledon	0	0	0	0	0	0	0	0	
33.Stabannon		28	43	43			45	45	47
<b>MAYO</b>									
9.Lough Conn		14	30	30				30	
10.Bog of Erris			30	30				25	
a. Mullet		1	1	1				15	
b. Carrowmore			5	5				5	
c. Owenduff	25	10	10					10	
<b>MAYO/GALWAY UPLANDS</b>									
11.Errif & Derrycraff		5	43				43	43	16
12.Connemara			7					7	2
<b>GALWAY LOWLANDS</b>									
13.Rostaff & Killower			100	100	52	97	50	97	
14.Lower Lough Corrib			7		0	0	0	23	
15.Rahasane turlough	36	40	50	50	58	0	0	58	
<b>CLARE/LIMERICK</b>									
16.Tullagher			13		13			13	
17.North County Clare			44		44			44	
<b>SHANNON HEADWATERS</b>									
20.Lough Gara			122		6	0	122	122	
<b>MIDDLE &amp; LOWER SHANNON</b>									
25.River Suck	61	58	165	165	148	163	133	133	100
26.Little Brosna			135		135			135	
<b>MIDLANDS</b>									
23.Midland lakes		195	210	210	205	196	218	218	
27.River Nore			7	7				7	
<b>SOUTH WEST</b>									
30.Killarney valley			7					7	
<b>SOUTH EAST</b>									
Wexford	5135	8051	8827	8827	9398	8372	8110	8110	
<b>COUNT TOTALS</b>	<b>5344</b>	<b>9541</b>	<b>11064</b>	<b>10297</b>	<b>10598</b>	<b>9910</b>	<b>10196</b>	<b>10622</b>	<b>165</b>
Ireland without Wexford			2237					2512	

Adding 8,110 at Wexford to the 2,512 counted from the rest of Ireland, and the British totals gave a global total of 20,797 Greenland White-fronted Geese in spring 2014, depressingly down on the 22,156 counted in spring 2013 (Figure 2).



*Figure 2. Spring counts of Greenland White-fronted Geese from Wexford Slobs, Islay and the global population count, 1983-2014. Values for the total population size are missing in some years when complete coverage could not be achieved. Values for spring 2001 were missing on account of the outbreak of Foot and Mouth Disease that year and were therefore also estimated from previous counts. The arrow marks the point at which autumn hunting in Iceland was stopped in 2006.*

## AUTUMN AGE RATIOS IN ICELAND

In autumn of 2013, Arnór Sigfússon continued his tradition of undertaking extensive age ratio sampling in Iceland. These data give us an irreplaceable snap-shot of what the breeding success has been like in Greenland in the preceding months and give a first taste of the likely reproductive output and abundance of geese to be expected on the wintering grounds. This year Arnór managed to sample an impressive number of Greenland White-fronted Geese in the west, mostly at Hvanneyri and in Mýrar on 2 October, where he found an average of 6.85% young in a sample of no fewer than 2,205 geese aged, with a mean brood size of 2.61 ( $\pm 0.22$  SE,  $n = 28$ ). In the southern lowlands on 4 and 8 October, he found 15.92% young amongst 823 aged, mean brood size 2.86 ( $\pm 0.20$  SE,  $n = 28$ ). Given that the geese staging in the western lowlands are generally those that tend to winter in Ireland, and those staging in the southern Iceland lowlands largely winter in Scottish resort, this fits remarkably well with the patterns described below based on samples subsequently derived from the winter quarters.

## AGE RATIOS IN BRITAIN

It continues to be vital that if we are to be able to understand anything about the processes behind the declines in population size of the Greenland White-fronted Geese, that we gather information on the reproductive success of geese as best we possibly can. It is not really possible to gather such data on the breeding areas, so we continue to be deeply indebted to all of those of you who supply age ratios and brood sizes sampled from your flocks in the field.

We achieved excellent coverage from counters in 2013/14 as shown below in Table 4.

**Table 4. Summary of age ratio determinations and brood sizes for Greenland White-fronted Geese wintering in Britain 2013/2014.**

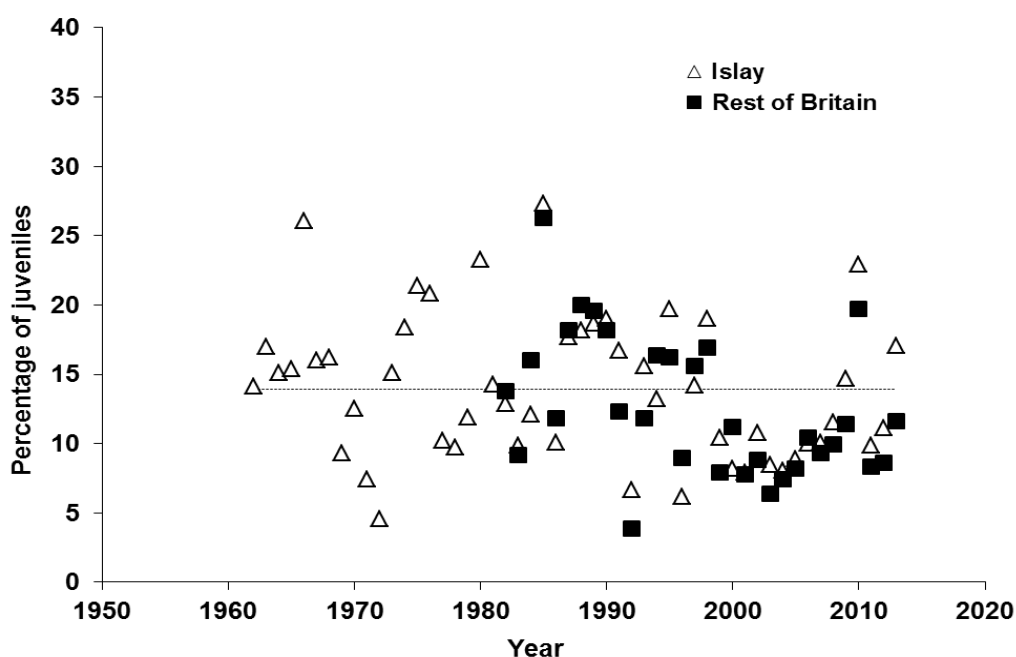
SITE	% YOUNG	AGED SAMPLE	MEAN BROOD SIZE	FAMILIES SAMPLED
The Loons, Orkney	22.50	40	4.00	1
Loch of Mey, Caithness	8.28	157	2.17	6
Westfield, Caithness	29.63	27	2.67	3
Kilpheder, South Uist	8.70	23	2.00	1
Tiree	9.52	683	2.17	30
Coll	2.20	182		
Fidden, Mull	15.63	32	2.50	2
Lismore	1.16	173	1.00	1
Lorn, Appin	8.33	60	1.25	4
Lorn, Benderloch	7.95	88	3.50	2
Keills	10.40	125		
Moine Mhor	27.27	11		
Rhunahaorine, Kintyre <sup>1</sup>	14.91	530	2.87	30
Machrihanish, Kintyre <sup>1</sup>	16.46	644	2.87	39
Clachan, Kintyre <sup>1</sup>	11.46	192	2.38	8
Colonsay	22.03	59	2.60	5
Islay <sup>1</sup>	17.04	3287	3.28	98
Lowlandman's Bay, Jura <sup>1</sup>	25.00	12	3.00	1
Bute	10.83	120		
Loch Ken	5.47	128	2.33	3
Stranraer	13.89	180	3.25	8
Endrick Mouth	12.20	41	2.50	2
Dyfi Estuary	8.11	37	3.00	1
Grindon Lough	0	2		
Britain, excl. Islay	11.62	3546	2.61	147
OVERALL	14.23	6833	2.88	245

<sup>1</sup>Details from Jura, Islay and Kintyre courtesy of Dr Malcolm Ogilvie

It was especially pleasing to see that the breeding season 2013 was responsible for the geese returning to Britain with slightly more offspring than in many recent years, particularly on Islay (see Figure 3). Overall, surveys after the 2013 breeding season found 14.2% young in the flocks overall (Table 4), quite substantially up on that of 9.6% in 2012. Breeding success was exceptional amongst some of the smaller flocks, with 22.5% on Orkney, 29.6% at Westfield Caithness, 27.3% at Moine Mhor, 22.2% on Colonsay and 25% on Jura, but above average in recent years for a number of other resorts, such as on Mull (15.6%), Rhunahaorine (14.9%), Machrihanish (16.5%), Stranraer (13.9%) and Endrick Mouth (12.2%). Islay also performed better than in recent years with 17.0% (compared to 9.9% last season and above the

average of 14.0% for 1962-2012 inclusive). Away from Islay, the sample of 3,546 birds assigned to age groups showed 11.6% young (Figure 3 and Table 4). Mean brood size was 2.88 (see Table 4) based on 245 families sampled from many sites, comprising a mean of 3.28 on Islay (n = 98) and 2.61 elsewhere (much as last year's 3.01 and 2.85 respectively).

The relatively high rates of production of young recorded on Islay after summer 2013 were above the average since 1962 and those from elsewhere in Britain were also above the values for all but one of the last 12 years (Figure 3).



*Figure 3. Age ratios sampled amongst Greenland White-fronted Geese at Islay 1962-2013 and compiled from other sites in Scotland and Wales, 1983-2013. The dotted line indicates the average percentage young amongst samples from Islay for 1962-2012.*

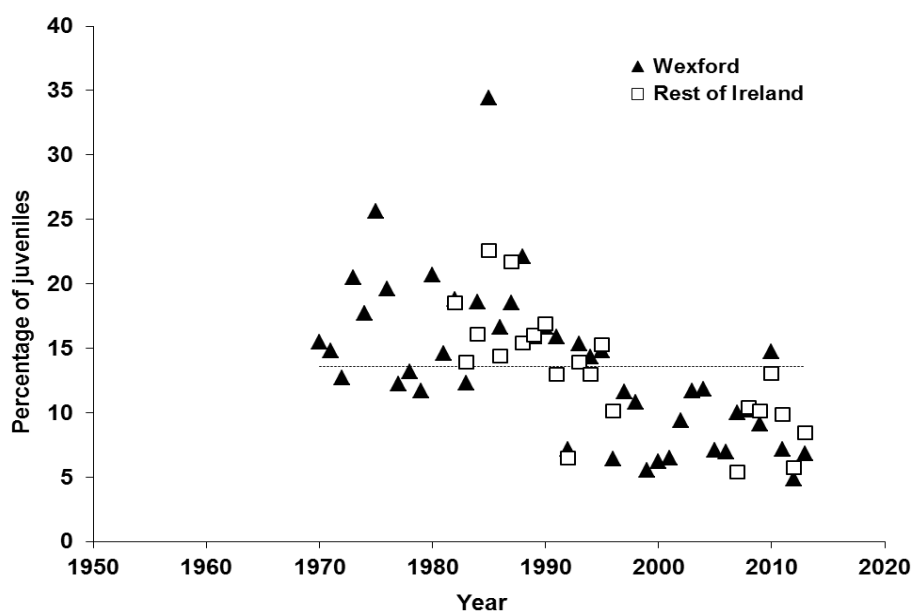
## AGE RATIOS FROM IRELAND

Breeding success at Irish sites where age ratios were sampled showed highly variable production of young, with Dunfanaghy (17.9%), Sheskinmore (11.9%), Little Brosna (15.4% and the Midland lakes (10.8%) all exceeding 10% young (see Table 5). In areas away from Wexford, there was an average of 8.5% young (n = 414, compared to 5.7% last winter) compared with 6.8% at Wexford Slobs (n = 4,964, compared to a drastic 4.9% last winter). This suggests better breeding success in 2013 than in 2012, but clearly this was simply not sufficient to help protect the overall numbers from falling again this year, although numbers of geese wintering in Ireland away from Wexford held up reasonably well. Nevertheless it is depressing to see the continued trend for production of young to remain largely doggedly under 10% since the mid-1990s, broken only by good performance in the summer of 2010.

**Table 5. Summary of age ratio determinations and brood sizes for Greenland White-fronted Geese wintering in Ireland 2013/2014.**

SITE	% YOUNG	SAMPLE	MEAN BROOD SIZE	SAMPLE
Dunfanaghy	17.86	28		
Sheskinmore	11.90	42		
Pettigo	0	34		
Errif and Derrycraff	0	43		
Connemara	0	7		
Rostaff and Killower	3.85	52		
Little Brosna	15.38	13		
Midland Lakes	10.77	195		
Wexford	6.79	4964	2.90	93
Ireland, excl. Wexford	8.45%	414	2.63	8
OVERALL	6.92%	5378	2.88	101

These low rates of production continue those since the mid-1990s, falling well below the long term average in most recent years, with the notable exception of the 2010 summer but unlike in Scotland (especially Islay), 2013 was not an especially good breeding year for Irish-wintering Greenland White-fronted Geese (Figures 3 and 4).



**Figure 4. Age ratios sampled amongst Greenland White-fronted Geese at Wexford 1970-2013 and compiled from other sites elsewhere in Ireland for years in which there exist sufficient data. The dotted line indicates the average percentage young amongst samples from Wexford for 1970-2013.**

## OBITUARY

### Peter Cunningham



We were deeply saddened to hear of the death of Peter (W.A.J.) Cunningham, who died peacefully in Stornoway Hospital on 8 July 2014. Peter had been an absolute stalwart of the Greenland White-fronted Goose Study annual census since its inception in the early 1980s and had keenly supported the compilation of counts and information throughout that time. As well as being an absolute gentleman with an encyclopaedic knowledge of the bird life of the Western Isles, Peter was deeply fond of his little flock of White-fronts on Lewis which he loyally counted and aged for so many years. He wrote a full account of this flock and its fortunes together with those of the other regular wintering flocks on the Uists in the *Hebridean Naturalist* (Volume 10: 64-68). Peter was a great enthusiast and persuaded a good many friends and colleagues (myself included) to drive him out to look at (and look after!) the geese when unable to drive himself (which he continued to do well into his 90s!). He chose a difficult flock – the little band of White-fronted Geese that winter in a few rushy pastures on Lewis between Barvas and Shawbost are often secretive and impossible to find, but Peter was diligent in keeping tabs on them as their numbers fluctuated around 25-40 individuals (although falling to 15 in 2005/06). Although he gave long and loyal service to the goose census, he was very active in so many fields and had long been respected as one of the greatest authorities on the natural history of the Outer Hebrides, long before there were many active naturalists on those islands. He was a pioneer of leading efforts to protect the delicate and unique nature conservation interest of the islands and to effectively conserve the delicate links between low intensity human land use and the wildlife which depended upon such activities. He wrote and recorded profusely on the wildlife of the islands and was a regular contributor to the Stornoway Gazette on items of wildlife news and interest that did a great deal to raise awareness amongst the local population. He was also amongst the founders and key developers of the Outer Hebrides Natural History Society, latterly Curracag, which has done so much to enliven the natural history interests of the islands and contribute significantly to their recording, monitoring and conservation. Peter lived to the grand age of 96, although cared for in later years, and made an enormous contribution through his global recognition as an authority on Hebridean wildlife. He will be greatly missed by many of his goose friends and I shall greatly miss our happy correspondence over so many years. Our sincere condolences and best wishes go to his family.

*Tony Fox (picture courtesy of the Hebrides News)*

## RESEARCH NEWS

### Report of the first year of the Scottish Natural Heritage/Wildfowl & Wetlands Trust project on Islay

As of the winter of 2013/14, the Isle of Islay (Argyll) is still the winter home to around 5,800 Greenland White-fronted Geese, making it the largest UK wintering resort, second only in numerical importance to Wexford (Ireland) throughout the wintering range. Numbers on Islay have been declining at a rate faster than the global average for the last 10-15 years. Despite this, Islay Greenland White-fronts have been relatively understudied in recent years, so it was timely that the Wildfowl and Wetlands Trust (WWT) were able to build on recent catching successes to initiate a two-winter study, starting in autumn 2013, to further investigate their winter ecology, funded by Scottish Natural Heritage (SNH).

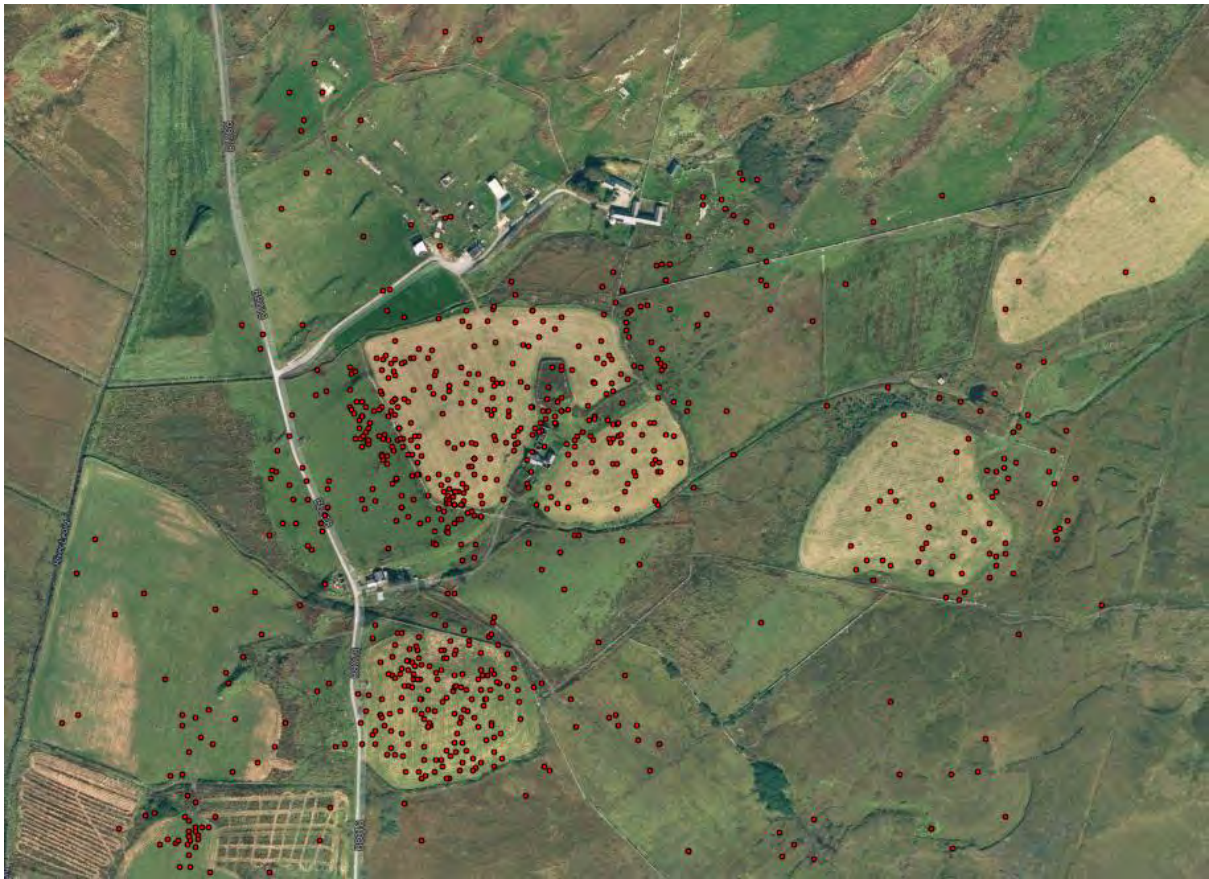
A key facet of the research was fitting collar-mounted telemetry devices to 12 Greenland White-fronts in the early part of the winter (Figure 5).



*Figure 5. Greenland White-fronted Goose “YLL” (bearing tag 21) “in the hand” after a catch at Loch Gruinart, Islay, November 2013.*

These tags were able to record up to 18 GPS fixes a day, giving us some key data on the behaviour of the birds and their habitat use throughout the winter; from identifying previously

unknown roost sites, linkages between feeding areas and refuges across the island, to some incredibly fine-scale habitat selection within fields (Figure 6). We can relate these specific locations to some basic habitat mapping conducted over the winter at a field-scale, as well as some targeted work in June where we visited a sample of the locations that the GPS tagged birds had visited, in order to characterise, in greater detail, the precise points within-fields that the birds were using. These data combined with data from the SNH and GWGS co-ordinated goose counts should enable us to build a model of feeding habitat selection and distribution of the Islay Greenland White-fronts.



*Figure 6. Fine-scale location data for one of the tagged Greenland White-fronted Geese caught at Grulinbeg, Islay 2013/14.*

The telemetry work was part of a much broader research programme with 581 re-sightings of 59 neck collared individuals – 40 of which had been caught on Islay by WWT over the past two winters, with the remainder from catches in Wexford, Loch Ken (Dumfries & Galloway) and Greenland. Abdominal profiles (>15,000) were recorded throughout the winter and these will be compared to data from Wexford to see if there is any difference in goose body condition between these two major wintering resorts. Geese at roost sites and on flight lines to and from roosts were counted through the winter. As well as giving an estimate of the number of geese using each roost site, we were able to map some of the linkages between roost sites and discrete feeding areas, giving credence to the notion that the Islay “population” can be considered as a number of smaller discrete sub-populations; with the implication that the Islay population should be managed on a flock-by-flock basis, rather than simply island-wide.

In light of the increase in lethal and non-lethal scaring of the Greenland Barnacle Geese on Islay by SNH as part of the Islay Local Goose Management Scheme, data were collected on the behavioural responses of Greenland White-fronts to the different type of scaring. These data will add a different level of understanding to the Greenland White-front distributional model, specifically allowing us to examine whether suitable feeding areas are being underutilised as a result of the Barnacle Goose scaring.

This coming winter will see us continue with all areas of the research, including trying to catch and tag some more individuals. Hopefully the batteries on last year's tags will still be going strong after their summer away, giving us insight into their remote breeding areas and further data for this winter as well. One of the tags deployed last year that was able to send GPS data remotely through the mobile phone/GSM network, and, as we write (15<sup>th</sup> September), we have just heard from the bird as it arrived back in northern Iceland (having arrived back into mobile phone coverage), having been last heard from as it headed to Greenland on the 2<sup>nd</sup> of May – all very exciting! The other tags all require remote UHF download through a hand-held aerial, and crucially we have no means of knowing where these birds are until they are re-sighted, so please keep an eye out for these birds throughout the wintering areas in Britain and Ireland. After many months in the Arctic the GPS collars, although originally painted black with white numbers, will probably look washed out grey and a number might not be decipherable; the birds will still have the normal engraved white leg ring though (see Figure 5). If this cannot be read do please still feel free to contact us to let us know if you see one of these birds on your patch!

*Ed Burrell, Larry Griffin, Carl Mitchell & Geoff Hilton*

### **Lowest numbers of Greenland White-fronted Geese ever counted in Isunngua**

July 2014 saw the Greenland White-fronted Goose Study undertaking another goose catching trip to Isunngua in west Greenland (Figure 7). We have now visited this area, which lies close to the southern extent of the White-fronted Goose breeding range, no fewer than eleven times since 1988. This year however, was the first time that we failed to catch any Greenland White-fronted Geese and the numbers within our survey area were the lowest yet recorded.

The team comprised of Stephen Dodd, Lexi Rodgers, Kat Snell, David, Rachel and Thomas Stroud, Niall Tierney, Huw Thomas, Benjy and James Wilcock. DAS, NT, BW and JW arrived in the field on 3 July and spent the first part of the month trying to establish as good an understanding of the numbers and distribution of geese as possible in preparation for the arrival of the remainder of the ten person team on 11 July. The 2014 season appeared to be a rather delayed one because, in contrast to previous years, we encountered Canada Goose young which were much smaller (including a likely day old family seen on 8 July) than in earlier seasons, suggesting rather late egg-laying for this species. We saw no evidence of White-front breeding in our core survey area, although a total of 33 adults and 9 young was seen, closer to the ice-cap. This total included a family with a brood of two, and three further adults with seven young – possibly belonging to two families. A separate group of 28 was also seen on one of the largest of the lakes near the ice edge. At least 12 of these were flying on 27 July suggesting that these were early moulting non-breeders.

Within the core area we found just nine White-fronts, all of them non-breeders – in stark contrast to a total of over 500 Canada Geese with a productivity of 25% ( $n = 530$ ) The average brood size amongst 29 families was 4.3 young, suggesting that this species is not currently suffering problems with low productivity in Isunngua. It is interesting to reflect how the fortunes of these two goose species have changed relative to how we encountered them during our first visit to this area in 1998, when we found 153 Whitefronts and just 12 Canada Geese in a similar area.



*Figure 7. Typical view of upland moulting lakes used by White-fronted and Canada Geese in Isunngua, central West Greenland.*



*Figure 8. The catches in Isunngua in summer 2014 were successful in trapping many Canada Geese but alas no White-fronted Geese...*

We caught geese on seven lakes, successfully capturing 186 Canada Geese (Figure 8). Of these, 46 were this year's young and 23 were re-trapped marked birds from previous year's catches. One goose is now on its third set of plastic rings having been first caught in 1997, re-ringed in 2008 and then again this year! There remain a fascinating set of stories to come from the Canada Goose data: many of the retraps are birds we are familiar with from resightings on their non-breeding areas in eastern Canada and USA. Please use the following link to access the lists of resighting histories of collared and leg-ringed Canada Geese caught in Greenland: <http://greenland2013.wikispaces.com/Recoveries+and+Resightings>

One of the more intriguing discoveries was orange goose neck collar C7D (Figure 9), found by James Wilcock close to the shore of lake 'C' during a catch there. This collar had been fitted to a Greenland White-fronted Goose which had been caught on this same lake in 1992. It was then seen on Islay the following winter and every year until January 1998 other than a very brief and intriguing visit to Wexford in March of 1996. The goose was never seen again after it was last reported seen on 28 January 1998. Given the numbers of observers on Islay regularly reporting neck-collared geese, the likelihood of resighting on Islay would have been pretty high had it still been alive and returned there. Hence, we can be fairly confident that it died naturally or was predated at some stage during (or after) summer 1998 back at its Greenland 'home'. It is an interesting reminder of the site-fidelity of these geese not just in winter but also on their breeding areas.



*Figure 9. The faded retrieved collar of C7D found close to Lake 'C' during July 2014 compared with the colour of a normal collar not exposed to direct sunlight.*

We will undoubtedly be returning to Isunngua to follow the fortunes of our marked Canada Geese in the future, but it is abundantly clear that we will now need to go elsewhere to find significant numbers of White-fronted Geese. We would like to extend our grateful thanks to the entire expedition team for their major efforts to catch these elusive and challenging geese and to ensure we derived accurate counts from as many lakes as possible. We would also like to express our sincere thanks to all those who – in various ways – supported this year's expedition.

*David & Rachel Stroud*

## **Mitch Weegman's Wildfowl & Wetland Trust funded PhD study – the final year!**

This past year has been incredibly insightful in the office and in the field as we uncover more amazing facts about Greenland White-fronted Geese and their 'quirks'. Part of the research I am conducting for my PhD at the University of Exeter involves analysing Greenland White-fronted Goose data collected over the last 30 years to understand patterns in reproductive success on an annual basis and over the entire lifetime of each of the many marked birds. I have recently finished these analyses and our findings are truly extraordinary: of 656 known-age geese (i.e. those marked as juveniles at Wexford), just 10% ever went on to breed. The analysis has confirmed that conditions experienced by birds in spring have considerable influence on subsequent breeding success. However, we have extended this analysis to link the breeding probability of an individual to the conditions that individual birds have experienced throughout their lifetime in west Greenland. This analysis showed that more birds bred when they experienced a run of 'good' years (i.e. milder, dry conditions). In recent years, these birds have experienced a succession of years with more adverse conditions for breeding, which we interpret as a major factor contributing to the recent declines in overall abundance brought on by several years of poor breeding success. Understanding how future changes in weather conditions in Greenland might further affect these birds will be paramount to understanding how long the current decline may continue.

Another aspect of the historical dataset I have been exploring is the duration of parent-offspring relationships. Some 20 years ago, Stephanie Warren initiated this work and found some birds remained in close association with their parents for up to seven years. With an additional 20 years of data, we have found that some birds actually remain with parents for up to 13 winters! This highlights the incredibly high survival of these geese, but also the remarkable decision that some offspring make to forego breeding (as they will not breed whilst with parents). Although these instances are extraordinary, we found that most birds actually remained with their parents for only two or three years, which is more similar to those documented for other Arctic-nesting goose populations.

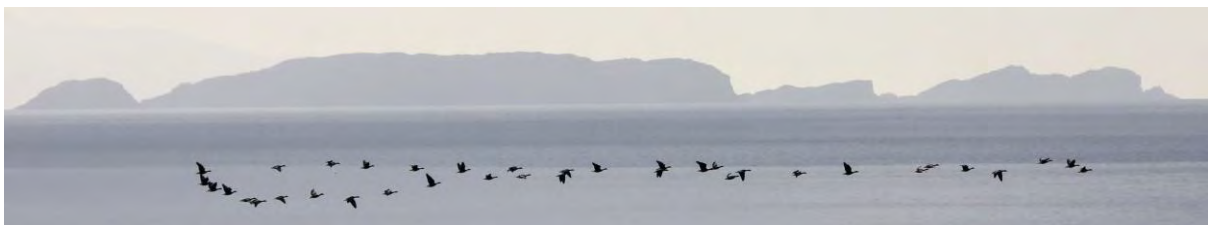
We have also finished deploying Global Positioning System (GPS)-behavioural tracking devices on birds at Loch Ken and Wexford. I was able to download one year (or more) of data from 15 tagged individuals. These tags record one GPS fix per day and also a trace of their behavioural activity every six minutes, allowing us to ask questions related to migration and breeding decisions, given daily energy expenditure (because we can measure how long individual geese were flying) and intake (because the trace also allows us to measure time spent feeding). These data also confirm the general pattern of migration phenology that we have demonstrated in recent years: birds are departing wintering areas sooner for Iceland, but not departing Iceland any earlier for Greenland. That birds exhibit this plasticity during early but not late spring ties into previous findings from the historical dataset, where birds likely time their departures for Greenland based on previous experiences and therefore likely time their movements based on changes in day length in combination with other environmental cues and their own nutritional and energetic condition.

Finally, we have been developing population models to better understand survival and movement between wintering flocks over the last 30 years. These models allow us to calculate emigration (based on collared birds resighted away from Wexford, where most birds are marked) and immigration at wintering sites; thus, these results will greatly help us understand how birds utilize sites throughout winter. We are hoping these models will also help us better understand the decline (e.g. to confirm whether survival may be a contributory factor). Unfortunately, our models are still running, but we will provide results and conclusions in next year's report. Watch this space!

*Mitch Weegman*



***Figure 10. Greenland White-fronted Geese and Highland Cattle, Lorn, February 2014, note the family group in foreground (photo Ian Francis).***



***Figure 11. Greenland White-fronted Geese flying in front of Garvellachs from Lismore Island, February 2014 (photo Ian Francis).***

## **Spring ice formation on Greenland White-fronted Geese neck collars**

I have to be honest, I have never liked putting plastic collars on geese. They look dreadful and to me, they always take the “wild edge” off the pleasure of looking at a flock of wild geese. On the other hand, to see a known individual year after year in Iceland on migration and in Argyll on the winter quarters is a deeply moving experience which really brings home how remarkable it is that these geese undertake their amazing migrations every single year throughout their lifetime. As we know, the Greenland White-fronted Goose has been going through a series of tough years, and there is no doubt we have derived an enormous amount of vital information from following individuals, their site fidelity, their mate fidelity, their reproductive success, their migration routes and timing and how long lived they are. Without fitting collars to enable us to follow individuals throughout their lifetimes, we simply would not know about so many features of their ecology and behaviour that help us to protect them. We have done a series of studies to try and monitor the effects of collar on goose behaviour and as far as we can ascertain they are benign. They have to be: if the collars are affecting the behaviour of the geese, we may as well stop using them because we would be getting information about birds that do not function normally. If this is the case our information from marked birds is worth absolutely nothing, except to tell us about the effects that the marking have on birds.

Over the course of the last 30 and more years, we have fitted over 2,800 Greenland White-fronted Geese with markers, the majority of these with collars and matching leg rings. These have now generated over 60,000 individual reports which as explained above have given us huge insight into the lives of these birds and via Mitch Weegman’s forthcoming PhD thesis will unlock many more unexpected secrets about their lives.

However, nothing prepared us for the shock in the spring of 2013 of seeing ice formation on the collars of some Greenland White-fronted Geese whilst they were staging at Hvanneyri in western Iceland (see Figure 12). During sub-zero temperatures and strong winds on 10–11 April 2013, we witnessed ice accumulation on plastic collars of staging Greenland White-fronted Geese. Because we were so concerned, we quickly initiated a study and found that, in all, ice affected 19 of the 77 collared individuals that were present at Hvanneyri at that time. Fortunately, all of the affected individuals had lost ice by 12 April, despite the fact that sub-zero temperatures continued at the site, although temperatures rose above freezing after 14 April. We were delighted to find no recurrence of ice formation before geese left for Greenland in early May.

Abdominal profile scores (a field assessment of accumulated body fat) did not differ significantly between geese with and without ice before their departure from Iceland, so the phenomenon had no effect on their ability to accumulate fuel for the onwards journey. There was also no significant difference in return rates between geese with iced (79%) or un-iced collars (83%) reported the following autumn from Iceland or the wintering grounds. Hence, as far as we could determine, the ice was short-lived, had no effect on the rate of fattening nor the probability of survival in the following year, but it was very unpleasant to witness nonetheless. We think that the geese had enjoyed a balmy arrival in Iceland with warm temperatures and extensive open water before the temperature plummeted and the wind began to blow very hard. We think that birds resorting to the freshwater lake at Hvanneyri therefore

were splashed persistently by waves whipped up on freshwater, which coated the collar and frost in sub-zero air temperatures. Hence geese roosting on the salt water fjord were not exposed to such effects, explaining why not all collars accumulated ice. These first reports of collar icing in over 30 years of the project give cause for concern and vigilance, but we recommend continued use of collars given exceptional weather conditions and lack of effects and we ask all of you to be vigilant to look out for these and other such adverse effects of collars so we can be aware of how they may affect these birds. You can read more about the icing and its effects on the bird in Fox et al. (2014) which I will be happy to mail to any of you in response to an e-mail to [tfo@dmu.dk](mailto:tfo@dmu.dk).

Fox, A.D., Walsh, A.J., Weegman, M.D., Bearhop, S. & Mitchell, C. (2014) Spring ice formation on goose neck collars; effects on body condition and survival in Greenland White-fronted Geese *Anser albifrons flavirostris*. *European Journal of Wildlife Research* 60: 831-834.

*Tony Fox*



**Figure 12. Collared Greenland White-fronted Goose SIL showing ice accumulation witnessed at Hvanneyri, west Iceland, 10 April 2013 (photo Tony Fox). This bird was seen without any ice on the collar the next day and was seen back at Hvanneyri the following autumn, has wintered at Wexford in the meantime and was back again at Hvanneyri on 5 October 2014 this season.**

## How Greenland White-fronted Geese are coping with climate change during spring migration

You will know and still be inspired the fact that all by Greenland White-fronted Geese wintering in Britain and Ireland migrate over the sea for 700–1200 km to stage for 3–5 weeks in Iceland in spring, where they tank up with energy and nutrient before continuing a similar distance over the sea and Greenland Ice Cap to their West Greenland breeding grounds. Thanks very much to your observations of departure dates reported from so many resorts over so many years, we were able to look in trends and changes in departure dates over several decades (see Fox et al. 2014). We found that during 1969 to 2012, the geese advanced the mean departure date from Wexford in Ireland by 15 days, during which time they also attained threshold fat stores earlier as well as departing in fatter condition. So, not only did the geese leave earlier, but they left with greater stores in recent years (i.e. they were fatter) than in previous times. Over that period, Iceland spring-staging geese shifted from consuming underground plant storage organs to grazing managed hayfields, which provide fresh grass growth despite sub-zero temperatures, when traditional natural foods are inaccessible in frozen substrates. During our studies in 2012 and 2013, geese arrived three weeks earlier to Iceland, in fatter condition and accumulated fat significantly slower than in 1997–1999 and 2007 when we undertook the same measurements. Indeed in 2012 and 2013 the geese looked positively lazy – they had a prolonged migration stopover in which to accumulate fat and they had plenty of food available to them to do so, so they spent much time sleeping by day (something unheard of in former years)! Although geese accumulated sufficient fat stores earlier in Iceland in 2007, 2012 and 2013, they still departed around the same date as in 1997–1999, prolonging spring staging in Iceland by an average of three weeks. We think that this plasticity in winter departure dates is likely due to improved winter feeding conditions (enabling earlier departure in better condition) as well as the novel and predictable food resource (reseeded grassland that grows despite the low temperatures) in Iceland. Greenland White-fronted Geese attained threshold fat stores in Iceland earlier, but remained there rather than departing to Greenland earlier. Indeed, despite the geese arriving earlier in Iceland, arrival dates on the breeding areas have not changed since the 1880s, presumably because of relatively constant cool springs and heavy snowfall in West Greenland during recent years. This shows how incredible flexible the geese can be in the way they time critical events in annual cycle and confirms that geese do not just respond to the day length when decided to start spring migration – their body condition also plays an important role. It also confirms that despite bringing the onset of spring migration forward, the last leap from Iceland to Greenland has not advanced in the course of over 100 years, presumably because the amelioration in spring temperatures and snow cover has not be sufficient to make it worth their while. Send a request to [tfo@dmu.dk](mailto:tfo@dmu.dk) if you would like a copy of the full article below.

Fox, A.D., Weegman, M., Bearhop, S., Hilton, G., Griffin, L., Stroud, D.A. & Walsh, A.J. (2014) Climate change and contrasting plasticity in timing of passage in a two-step migration episode of an arctic-nesting avian herbivore. *Current Zoology* 60: 233-242.

*Tony Fox*

## ACKNOWLEDGEMENTS

We always struggle to find the adequate words to thank everyone who has so kindly helped by contributing counts, age ratios, brood sizes, collars and ring readings as well as all the stories and anecdotes of observations and experiences with Greenland White-fronted Geese during the last year! Nevertheless, we continue to be deeply grateful to every one of you that contributes information unfailing every year and thank you very much indeed for your help and support that continues to keep this amazing run of monitoring running. Without your help, we would be sunk, so thanks for all your contributions again this year and we hope you will continue to help in the same way in the coming winter. Thank you to you all!

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*Figure 13. Part of a group of 135 birds counted on Lismore Island, February 2014 (photo Ian Francis).*

**PLEASE NOTE THE AGREED COUNT DATES FOR THE COMING YEAR:**

**Internationally coordinated counts: 13-17 December 2014 and 14-18 March 2015**

**Preferred monthly counts:** 15-19 November 2014, 10-14 January 2015, 14-18 February 2015 and 28 February-4 March 2015.