

## The summer status and distribution of Greylag Geese in north and west Scotland

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*The numbers and distribution of Greylag Geese were recorded in north and west Scotland in late August 1997. The census found a minimum of 10,000 geese, comprising 1258 adult pairs, 3220 goslings and 4264 non breeding adults. Principal concentrations were found on the Uists (3311), Coll & Tiree (2366), Sutherland (1262) and Orkney (1114). The current population estimate is discussed in relation to the historical status of Greylag Geese in this area of Scotland, and other groups of the same species in Britain.*

### Introduction

The Greylag Goose *Anser anser* used to breed in the wild in the East Anglian Fens, Lancashire, the Lake District and probably many other parts of Britain before the reed marshes and fens were reclaimed for agriculture in the 17-19th centuries (Owen *et al* 1986). By the early 20th century the species was restricted to north and west Scotland, but between 1930 and 1970, flocks were again established in many parts of the country, especially in west Galloway and in England (Atkinson-Willes 1963, Owen *et al* 1986) and many were derived from eggs or goslings from the native stock on the Uists. Most of the indigenous birds are now restricted to the Uists, Harris/Lewis, Coll/Tiree, and the northern and westernmost areas of mainland Scotland and associated coastal islands. Greylag Geese also breed in Shetland and Orkney although proven breeding is a recent occurrence and the provenance of these birds is unknown.

At the end of the 19th century, the Greylag Goose still bred in considerable numbers in Scotland in the Outer Hebrides, the northwest coast and in Caithness/Sutherland (Berry 1939) but not in Shetland and Orkney (Holloway 1996). It was, however, subjected to almost continuous

persecution. For many years it appears that few nests escaped destruction, and birds were killed both in and out of season. A dramatic decrease in numbers and contraction in range began at the end of the 19<sup>th</sup> century and continued for the first 30 years of the 20<sup>th</sup> century. The chief causes were persecution by crofters, whose corn and oats the geese damaged, especially in autumn, and excessive sport shooting on estates. Increasing motor traffic, egg collecting and summer trout fishing on previously undisturbed lochs and, in the 1930s, an increase in the numbers of Great Black-backed Gulls *Larus marinus* which can kill broods of young geese, may also have contributed to the reduction in numbers. Certainly by 1920, the species had ceased to breed on North Uist, and Berry (1939) reported that '...in Scotland as a whole, the Greylag appears in danger of extinction as a breeding species..'.

Clearly small pockets of Greylag Geese survived in the north and west of Scotland, and since the 1960s, numbers of geese have shown a period of gradual increase (Owen *et al* 1986, Thom 1986). Changes in legislation in Britain, beginning with the 1954 Protection of Birds Act, reduced the number of ways in which Greylag Geese could be taken or shot, and at the same time, a number of

protected areas were established (eg Loch Druidibeg, South Uist). Also during the same period, Greylag Geese began to take advantage of the higher quality herbage available on improved grasslands. These changes occurred concurrently and the net effect has been to reduce winter mortality.

The remnant groups of native Greylag Geese restricted to the very north and west of Scotland through persecution at the end of the last century became isolated, and in terms of numbers, probably reached a low point in the first half of the 20th century (Berry 1939). A small degree of dispersal from the remnant stock was sufficient to colonise either new areas, or possibly former breeding areas, albeit in a rather restricted band from Colonsay, along the west coast and probably as far north as the northern isles.

On cultivated islands, recent increases in the numbers of Greylag Geese is thought to be partly due to greater breeding success and recruitment, resulting from an increase in the quality and quantity of improved pasture since the 1960s (Paterson 1991) and also reduced persecution during the close season.

Recent attention paid to migratory populations of geese in Scotland (eg Scottish Office, 1996) exposed an apparent gap in our knowledge of the status and distribution of Scotland's only native breeding goose. Hugh Boyd attempted to count breeding Greylag Geese in Scotland using an aerial survey in 1959. However, the sheer scale of the task in such remote areas, and the retiring nature of the families, precluded a full assessment being made. No real attempt at a coordinated census has been attempted since. Surveys of Greylag Geese in 1989-91 (Brown & Dick 1992) and in 1990 (Delany 1993) did not focus on the north and west of Scotland, and breeding survey fieldwork in 1988-1991 (Gibbons *et al* 1993) did not aim to establish numbers in post breeding

flocks. This paper describes the results of a survey of post breeding Greylag Geese in late summer 1997.

## *Methods*

Most Greylag Geese moult in July close to the breeding areas, and small flocks tend to gather in remote upland or secluded coastal areas. After the moult, the geese move often only short distances to agricultural feeding areas. Thus it seemed sensible to undertake a survey during the late summer when birds had moved away from more inaccessible areas. Counts of Greylag Geese took place during the last 2 weeks of August 1997. Most monitoring involved checking suitable post breeding habitat on foot or by car. Monitoring took place north and west of Glen Mor between Fort William and Inverness, although counts were also undertaken in west Argyll as far south as the Kintyre peninsula and on islands to the west. Local knowledge of the status and distribution of summer flocks was sought and used wherever possible. Casual observations were sought from birdwatchers and hill walkers through the publication of requests for information in appropriate magazines and newsletters. When a flock of geese was located effort was made to identify goslings (through plumage characters) in order to assess the proportion of young. Observers were asked to note the habitat type the geese were encountered on.

Overall coverage was comprehensive with few, if any, seemingly suitable mainland areas missed. Large areas of north and west Scotland were unchecked due to their apparent unsuitability (essentially land higher than 200m, or coastal areas lacking suitable feeding areas). Many small offshore uninhabited islands were not checked either, although where Greylag Geese were known to occur through *a priori* knowledge of local counters, every effort was made to check these sites. For example there are several hundred small

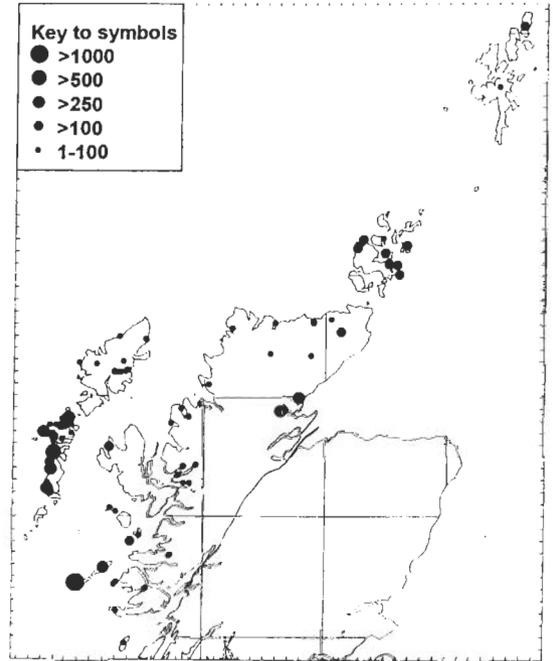
islands in the Sound of Harris where occasional pairs of Greylag Geese are known to breed. Yet it also known that by mid August the nesting islands are largely abandoned in favour of one or 2 large inhabited islands where the Greylags feed on managed grasslands. However, we are conscious that Greylag Geese in north and west Scotland can be found in remote areas, thus the results of the census must be treated as an absolute minimum.

**Results**

The total counted was a minimum of c10,000 birds, including approx 3320 young of the year. The distribution of Greylag Geese is shown in Figure 1 and Table 1. Principal concentrations were found on the Uists (3311), Coll & Tiree (2366), Sutherland (1262) and Orkney (1114). The distribution of Greylag Geese in August 1997 was largely concurrent with the breeding distribution reported for the 1988-91 Breeding Birds Survey (Gibbons *et al* 1993) and 58% of 10km squares that held breeding geese in 1988-91, held post breeding flocks in 1997. Comparing the two distribution maps shows a shift away from remote upland areas to lower lying agricultural land, although the distances involved are relatively small. Greylag Geese were primarily encountered on agricultural land 55%, Table 2, with most favouring improved grasslands. However, many geese were also found close to natural wetlands.

The average flock size was 62 (n=66 flocks), and the overall proportion of young recorded in sample flocks was 32.2% (n=1391 aged). The average brood size was 2.56 goslings (n=154 broods), and assuming that each brood was accompanied by 2 parents, this equates to approximately 1258 adult pairs and 4264 non breeding adults. The breeding success was similar to the long term average for the Uists (27%, 1987-93, Mitchell 1999). Mitchell (1999) noted that early breeding at a relatively low altitude and the absence of a long

**Figure 1** The distribution of Greylag Geese recorded in north and west Scotland during late August 1997.



migration may increase gosling survival compared to Greylag Geese breeding in Iceland for example. Loch Loyal (Sutherland) is an important moulting site for non breeding geese from other parts of north Scotland (see below).

**Inner Hebrides**

**Coll/Tiree**

The presence of Greylag Geese in summer on Coll/Tiree appears to be rather poorly documented. According to local crofters, the presence of geese in the summer has only been noticeable in the last 30-40 years (I McDonald *pers comm*) There appears to be no historical records of breeding prior to the early twentieth century, although after an increase during the

**Table 1** *The numbers of Greylag Geese recorded in north and west Scotland in late August 1997.*

<b>Inner Hebrides</b>		Kirton, Lochaber	94
Coll	291	Plockton, Lochaber	46
Tiree	2075	Isay, Skye	100
Colonsay	86	Achiltibuie, Wester Ross	40
Treshnish Isles	104	Inversdale, Wester Ross	13
Mull	154	Loch Carron, Wester Ross	56
Eigg, Small Isles	72	Longa Island, Wester Ross	12
Muck, Small Isles	200	Mungasdale, Wester Ross	63
Canna, Small Isles	16	Tournaig, Wester Ross	56
		Tournapress, Wester Ross	11
<b>Outer Hebrides</b>		<b>Caithness/Sutherland</b>	1262
North Uist	1670	<b>Northern Isles</b>	
Benbecula	595	Orkney	1114
South Uist	1046	Mainland, Shetland	20
Harris/Lewis	268	Unst, Shetland	100
<b>Northwest Scotland</b>		<b>Total (minimum)</b>	<b>9618</b>
Acharacle, Lochaber	40		
Eilean Tioram, Lochaber	14		

1940s post breeding flocks reached 50-100 birds (Owen *et al* 1986). In 1938, a pair bred on Coll for the first time in many years, and further records suggest numbers slowly increased from that time (Boyd 1958, Sharrock 1976).

Winter numbers on Coll/Tiree appear to have increased from c670-920 individuals in 1985-87 (Stroud 1988) to c2900 in 1997 (c22% per annum, Figure 2). The combined (Coll/Tiree) count of 2366 in August 1997 is some 500 birds fewer than that recorded in the previous winter. With the addition of several hundred goslings hatched in 1997, this is somewhat surprising. Charlie Self, counting on Coll, noted that the number of geese he found was lower than he had expected. He had previously encountered 443 adults and c300 goslings earlier in the summer and had expected to find 700+ geese during the time of the census. The geese were probably still in the more remote areas of this island and thus led to an underestimate

of the real number summering there.

On Tiree, principal post breeding concentrations occurred on Loch Rhiagain, Loch an Eilean, and Loch an Phuill. On Coll, large post breeding gatherings were found on Loch Cliad, Ballyhaugh, Loch nan Cinneachan, Loch Anlaimh and on the headlands around Crossopol Bay.

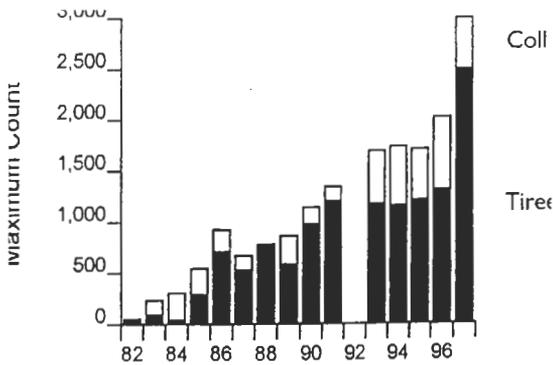
**Table 2** *Habitat type of Greylag Geese flocks recorded in north and west Scotland in late August 1997 (sample size 3924).*

Improved grassland	37.4%
Barley stubble	8.3%
Unimproved grassland	5.2%
Set aside	5.2%
Natural loch	14.4%
Saltings/mud/marsh	14.4%
Sea loch	12.6%

## Other islands

Small numbers of Greylag Geese breed on other Hebridean islands (eg 25 adults and 7 young on Colonsay in 1995; 6 broods on Mull in 1995, Argyll Bird Report). The combination of secluded,

**Figure 2** Numbers of Greylag Geese recorded in winter on Coll & Tiree, 1982-1997. Data from annual Argyll Bird Reports and Alan Leitch, pers comm.



undisturbed offshore islands, together with nearby grazing meadows favours small pockets of geese. On Islay, records of Greylag Geese in the summer have been few although the potential for colonisation appears to be only a matter of time.

## Outer Hebrides

### The Uists

Records of Greylag Geese go back to the 18th century, when attempts were made by crofters to keep the geese away from their autumn cereal crop (McKay 1980). By 1920, some 200 pairs were still reckoned to breed on South Uist, but it seems the numbers had been even higher (Baxter & Rintoul 1953). Certainly by the same year the species had ceased to breed on North Uist. The reasons for the decline were partly the changes in land tenure and growing persecution by crofters

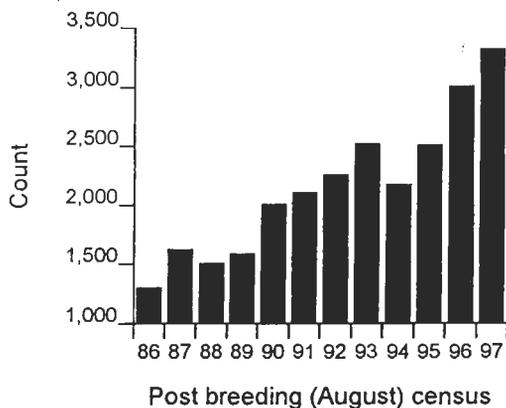
and partly the overshoot on the estate in the years up to 1914. At that time, the geese on South Uist were afforded no close season, and large numbers were shot in March and April. The only legal protection was a ban on the taking of eggs (Owen *et al* 1986). Numbers appear to have reached a low point by the 1930s (Berry 1939) but from the 1940s onwards there seems to have been a noticeable increase.

Counts of Greylag Geese were undertaken on the Uists in 1968-72, when c700-800 individuals were recorded (Newton & Kerbes 1974). Numbers increased to 1676-2000 by 1982 and the number of breeding pairs increased from about c140 (Sharrock 1976) to c 200-300 over a similar period (Thom 1986). Regular counts on the Uists since 1986, suggest an increase from at least c 1600 birds in the mid 1980s (Paterson 1986) to c 3300 individuals in 1997 (c12% per annum, Figure 3). Breeding occurs on coastal sites in heather *Calluna vulgaris*, grass/rush stands and low scrub. Principal post breeding concentrations occurred on machair areas on the west of the archipelago at Balranald/Clettrevall, Ath Mhor, Berneray, on Benbecula and several sites on South Uist.

### Harris/Lewis

On Harris/Lewis a small dispersed group now numbers over 200 individuals. No systematic count during the summer had been carried out previously thus the rate of change cannot be estimated, however, it seems likely from previous observations that the numbers now are larger than in the last 30 years. During the Second World War and the following 20 years or so Greylag Geese were harassed by random and indiscriminate shooting of migrant geese on almost all estates but more so on Barvas, Galson and Stornoway Trust Land. Illegal, untimely and careless burning of moorland and heather clad islands on freshwater lochs destroyed nests. The

**Figure 3** Numbers of Greylag Geese recorded in late August on the Uists, 1986-1997. Data from Mitchell (1999) and Roderick McDonald.



taking of eggs for rearing geese for Christmas was prevalent during the same period. The introduction of the American Mink *Mustela vison* in the mid fifties may also have led to some local decreases in numbers. Breeding seemed then to be confined to Eilean Mor on Loch Orosay, south of Stornoway, and even there local butchers were said to be taking flightless young for the pot.

In Harris, the main breeding grounds are now on Lochs Steisevat and Moracha and associated waters behind Leverburgh and on some of the islands in the Sound of Harris, such as Pabbay, Killegray, Sleicham and Heisker. Families have been reported also from the east coast of south Harris at suitable lochs such as Plocrapool. In Lewis, a similar Anserine diaspora has taken place with a diminution of pressure on the local geese in winter and spring and Greylag Geese seem to be increasing in number. Families may now be found on many freshwater and sea lochs where they were hitherto unknown to the present generation. The widespread establishment of

reseeded moorland, especially in Lewis, since the 1950s, initially intended for cattle but degraded by sheep has doubtless been to the Greylags advantage. An assessment of the breeding distribution has not been undertaken and is not considered practicable owing to the size and diversity of the area.

### Northwest Scotland

There have been infrequent records of Greylag Geese inhabiting the coast of Wester Ross and Sutherland during the last 40 years. For example, Greylag Geese appear to have been present in very small numbers on the Summer Isles and Skye (H Boyd *pers comm*, Holloway 1996), with breeding occurring on several offshore islands. In 1997, Greylag Geese were still thinly distributed, although flocks of up to 100 birds were noted in several places. Many of the coastal areas are unsuitable for supporting large flocks. Although low, offshore breeding islands are relatively plentiful, the availability of suitable lowland, undisturbed grazing areas, and a safe roosts is limited and this may contain future population growth.

### Caithness/Sutherland

Due to the size and inaccessible nature of Caithness/Sutherland, summer counts have not achieved full coverage, although numbers there were thought to be stable at c 2200 for the last ten years (F Symonds, *pers obs*). Alan Wood recorded 1437 moulting Greylag Geese in July 1992 at Loch Loyal and, in 1994, Ian Stenhouse found 1100 Greylag Geese at 6 moulting lochs during a road transect, including 846 at Loch Loyal. In 1997, 896 Greylag Geese were recorded moulting at Loch Loyal. The count for Caithness/Sutherland in 1997 (1262 geese) therefore, appears low although this may be consistent with a reduction in the size of the moulting flock at Loch Loyal.

## Northern Isles

### Orkney

There are no historical records of Greylag Geese breeding or summering in either Orkney or Shetland (Holloway 1996, E Meek and D Okill, own data), and nesting was first recorded as recently as the mid 1980s (Pennington 2000). It seems likely that the current numbers summering there derive from birds originating from Sutherland, or possibly, small numbers of over summering Iceland Greylag Geese (see Pennington 2000 for a summary). In Orkney, these have been augmented with a few birds deliberately released for hunting (C Booth, *in litt*). Two Greylag Geese marked in Sutherland in July 1996 were recorded in Orkney in winter 1996/97, indicating that there may be some, albeit modest, connection between the mainland and Orkney. Summer counts suggested c 50 pairs in 1993/94 (and c200 non breeding birds) on Orkney and c200 birds in total on Shetland. The 1997 count of 1114 Greylag Geese on Orkney is the largest ever recorded and is probably not fully comprehensive in light of the fact that breeding is occurring on small, uninhabited islands which were not visited during the survey. Nesting is now taking place on moorland areas and around lochs on the Mainland, Shapinsay, Gairsay, Stronsay, Sanday, Burray, Copinsay and probably Rousay, as well as on a series of small islets, in the waters offshore from these larger islands. Post breeding concentrations occur on freshwater bodies close to the breeding sites, and in the case of the smaller islets, on the sea. The greatly increased wintering population of Greylag Geese in Orkney in recent years has begun to cause considerable worries amongst the local farming community and at least one farming organisation has called for action to be taken to reduce numbers. The presence now of considerable numbers outside the winter period is raising the degree of antagonism even further.

### Shetland

Pennington (2000) documents the increase in numbers and range of breeding Greylag Geese since the 1980s and a concurrent increase in reseeded hillsides during the period of colonisation has evidently favoured the species. In light of recent, more thorough coverage it seems the count of 120 birds in 1997 was low. Pennington (2000) suggested the colonisation of Shetland was by Icelandic breeders short stopping yet without any evidence from ringed individuals there remains the possibility that the birds breeding here originated from the mainland Scotland stock, or even a mixture of the 2.

### *Dispersal from breeding areas*

Ringing studies on the Uists, Coll and Tiree and in Sutherland confirm the rather sedentary nature of the Greylag Goose in north and west Scotland. For example, of 500 Greylag Geese ringed on North Uist only 7 have been recorded away from the Uists. On Coll/Tiree, over 400 Greylag Geese have been ringed in 1998-99 and none have been seen away from the islands.

However, some minor movement between the offshore island and groups on the west coast of mainland Scotland was sufficient to promote and retain genetic mixing and, through dispersal, further the establishment of new breeding colonies. Of the 7 records of movements away from the Uists, 5 birds were recorded on Tiree, one went to the north coast of Lewis and another moved south to Colonsay. The use of individual marks (plastic leg rings and collars) has shown that while the majority of birds move very little, a small minority do move sufficiently to promote genetic mixing with other stock. It seems likely therefore, that the colonisation of Coll/Tiree in the middle of the 20<sup>th</sup> century resulted from birds moving southeast from the Uists.

Recoveries and sightings of Greylag Geese marked at Loch Loyal (Sutherland) in 1996-97 have been reported from Orkney and along the west coast of Easter Ross suggesting that this site is an important moulting ground for birds from an area greater than the Sutherland breeding sites.

A record of 800-1000 Greylag Geese on Muck on 12 September 1997 when the summer population was estimated at 200 birds appears too early to be Greylag Geese from Iceland and suggests a major post breeding movement, although it is not known where these birds may have originated from or what caused the movement.

### ***Discussion***

The range of this stock of Greylag Goose, for now, is still restricted to areas of north and west Scotland. This would enable the development of a conservation plan for these geese to guide national conservation and management actions, since this would involve relatively few organisations. For management purposes, the Greylag Geese breeding in north and west Scotland may be regarded as the remnants of the native stock (see Mitchell 1999). They are relatively sedentary although some minor movement between islands and mainland areas aids dispersal to new areas. However, the status of the native groups needs to be fully examined in light of the various reestablishment schemes carried out from the mid 1930s. Delany (1993) found approximately 2000 reestablished Greylag Geese in Scotland in areas to the south and east of the Great Glen (*eg* Perthshire). These are derived from reestablishment projects carried out by landowners, the Nature Conservancy, the Wildfowl Trust and various shooting clubs (Sedgwick 1975). Many of these reestablished birds derived from eggs or goslings from the native stock on the Uists (Sedgwick 1975, Atkinson-Willes 1963). The gradual spread of the reestablished Greylag Goose north has been

coincidental with the recent increase in numbers and spread of the native Greylag Goose south. However it may be safely predicted that eventually the 2 stocks will interbreed and Greylag Geese will once again nest over much of Britain. Morphologically, there appears to be no difference in measurements between the two stocks (WWT unpublished data) and it might be argued that since much of the reestablished stock derived from native birds they are genetically comparable too. Perhaps higher land surrounding the Great Glen merely remains as a physical barrier between future integration.

The 1997 survey was the first successful attempt to cover the whole range of the indigenous stock. However, future monitoring of the distribution and numbers of breeding Greylag Geese will probably necessitate a full survey of not only the north and west of Scotland but also of the rest of Britain in order to assess the extent of integration of the 2 stocks. The continuation of ringing programmes should help to monitor the progress and pace of integration.

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