



**Svalbard Barnacle Goose distribution around
the Solway Firth 2014-2015: Flock counts
from the Solway Goose Management Scheme
area**

WWT Conservation Programmes Report

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June 2015

Published by:

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This publication should be cited as:

Griffin, L. 2015. Svalbard Barnacle Goose distribution around the Solway Firth 2014-2015: Flock counts from the Solway Goose Management Scheme area. Final Report to SNH. WWT, Slimbridge. 23 pp.

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Executive Summary

A total of 13 route counts were carried out in winter 2014-2015 within the Solway Barnacle Goose Management Scheme area. Flock counts were made for all goose and swan species encountered, with flocks assigned to fields by code. The times of day, the days of the week and the starting points at which the counts were conducted were varied as much as possible to avoid bias in terms of when a section was surveyed. Instances of direct disturbance clearly aimed at the geese and of conversations with farmers were also noted. Data are also presented on the coordinated Solway population (JNCC) counts of the Svalbard Barnacle Goose and on brood size and productivity estimates for this population. The adopted total for this population wintering on the Solway was 37,300 geese (the mean of four counts that were within 10% of the maximum of 38,826 recorded, rounded up to the nearest 100), a decrease of 800 birds on last winter's adopted estimate of 38,100 geese. This apparent decrease in the population was probably due to the relatively poor breeding season in 2014 compared to 2013, with count conditions being reasonably good in 2014-2015 and the geese making little use of areas outside their usual range. Brood sizes were small this winter at 1.7 goslings per family – which is the second lowest recorded in the current ten year period (range 1-4 goslings; 215 families sampled), with an average juvenile productivity of just 5.0% - the lowest recorded in the current ten year period (range 2.7-14.7% young; 15 flocks and 13,104 birds sampled) compared to 2.0 goslings per family and 7.0% young for the previous winter. A minimum of two different leucistic Barnacle Geese was recorded in winter 2014-2015, sometimes being seen in the same flock and mostly on Burgh Marsh or Rockcliffe Marsh (Cumbria) as in previous winters or occasionally on Redkirk Marsh near Gretna or at Hurkledale, Caerlaverock or Mersehead.

1 Introduction

The Solway Firth is an internationally important site for a number of wetland bird species being a key site for the wintering Svalbard Barnacle Goose population. By mid-winter 99% of this flyway population utilise five main sites around the Solway, with three of those being on the north side of the Firth, including Caerlaverock, Kirkconnell (Nith), and Southwick. This century with the growth of the population to over 35,000 birds, the distribution has spread west towards the Outer Solway with geese now visiting the areas around Colvend and Auchencairn on a regular basis, with significant flocks at Wigtown typically from late February to early April.

The geese mainly feed within established nature reserves or within the Solway Barnacle Goose Management Scheme area, often choosing stubbles in early autumn and improved pastures and saltmarsh throughout the rest of the winter. SNH has run this management incentive scheme on the Solway since 1995 in order to integrate farming and goose grazing needs on areas of improved agricultural land. On land entered into the scheme, tiered payments are made to help cover the extra costs of managing for Barnacle Geese. Fields are classified as 'Feeding', 'Buffer' (which receive a tiered payment) or 'Scaring' (non-payment) zones depending in large part on the typical level of winter goose use. Controlled scaring is encouraged in the non-payment zone to try to keep the geese within the feeding or buffer zones and is also permitted to a limited extent in April, as due to budgetary constraints imposed since 2012, not all fields in the Scheme area can now receive payments for the April period.

1.1 Objective

The overall objective of the survey is to assess the distribution and abundance of the Svalbard Barnacle Goose and other goose and swan species on the fields and saltmarsh of the north side of the Solway Firth in relation to the Solway Barnacle Goose Management Scheme area.

2 Methods

2.1 Management Scheme route counts

Counts were carried out within a 14-day cycle and the starting points were varied to prevent counting any area at the same time of day, with count days spread evenly throughout the week including weekends. Geese and swans in larger flocks were counted in tens on a tally counter, while those in smaller flocks of <100 were counted individually. All flocks were mapped and coded according to the SNH convention on the field maps provided. Each day was broken down into four counting periods to cover the four main count areas (**Table 1**), starting at first light with allowance made for weather conditions, e.g. geese tend to be slow to move off the roost during periods of frost such as those geese flying off the Blackshaw Bank roost to utilise fields up the River Nith at Greenmerse and Kirkconnell. The time of observer arrival at each count section was recorded. Where significant numbers of geese moved during a count, the field the geese moved from and to was recorded with a “Comment” added within the Excel spreadsheet provided. Observations of leucistic geese and other goose species of note have also been added.

As agreed with SNH, in a modification to the previous methodology, only data from the official Scheme count days are included in this report as coded field counts. Summary census counts for the whole Solway and reproductive success estimates as provisioned under the JNCC contract are also provided in summary form for reference. The count route repeated every 14-days covered areas to the east as far as Hurkledale and to the west as far as Colvend. Significant use of any fields outwith the intensive survey area was noted during the census counts.



Figure 1. The Inner Solway Firth showing the main areas surveyed during the SNH Solway Goose Management Scheme counts (black polygons). Site names are referred to in the text and also cover those areas surveyed during the coordinated JNCC census counts. For mapping clarity, Wigtown Bay and RSPB Crook of Baldoon are not shown as they are 20km to the west of Borgue.

Areas where there are difficulties observing the fields from the road are well known as are the high vantage points which can be utilised to count them from. Otherwise approach on foot was adopted with prior permission being sought for access.

The presence and nature of any disturbance to the geese, intentional or otherwise, was noted using the SNH field code system provided.

Impromptu discussion with any landowners during the surveys was welcomed and a record of each conversation along with those had during arranged visits or calls to a farmer regarding the geese was logged.

Care was taken in relation to biosecurity and disease prevention, and where access to fields was required there was compliance with any precautions required by the landowners, with gates being left as they were found.

Table 1 – Count sections covered within the counting periods.

Count Period 1	Count Period 2	Count Period 3	Count Period 4
Thwaite	Nith	Southernness	Colvend
Nith	Thwaite	Colvend	Southernness
Southernness	Colvend	Nith	Thwaite
Colvend	Southernness	Thwaite	Nith

As with last winter it soon became clear that the Priestsid area was being used occasionally by the Barnacle Geese whereas the section to the northeast of Ward Law covering the Quay Hill was not being used and was therefore not surveyed on a regular basis although it was covered during the co-ordinated counts. In previous years the Priestsid section has been dropped due to a lack of goose use but this winter it was surveyed. During the co-ordinated counts of geese on the Solway, geese were rarely recorded in the Auchencairn/Rascarrel area in mid-winter and from February onwards small numbers of Barnacle Geese began using the Wigtown area with sporadic use of the Redkirk/Baurch/Gretna area too (especially Redkirk Merse) but this could not be economically covered via the SNH route count budget.

2.2 Coordinated Svalbard Barnacle Goose total population counts

Each winter WWT has conducted total population counts of the Svalbard Barnacle Geese present on the Solway from arrival to departure. This involves a network of staff and volunteers counting the geese in survey sections within a one- to two-hour time-period at the same time on the same day. There are weekly counts during the arrival period in October and during the departure period in April/May, with monthly counts from November to March.

2.3 Brood sizes and juvenile productivity of the Svalbard Barnacle Goose

Each winter WWT carefully assesses the brood sizes and juvenile productivity of a large proportion of the Barnacle Geese from as many sites as possible around the Solway. The dates, land use types, and flock sizes used for sampling are varied as much as possible to avoid any bias in the average estimate obtained, as are the sampling units within the flocks as families with young can tend to associate at the edges of a flock, particularly at the front. All observations were carried out by an experienced observer.

2.4 Tide tables

Figures 2 and 3 show tide tables for the months during which the geese were present in the Barnacle Goose Management Scheme area.

SEPTEMBER 2014 LAVER'S LIVERPOOL (Gladstone) TIDES

All times shown are GMT - add one hour from 0100 30 March to 0100 26 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER			LOW WATER			SUN MOON										
	Time	M	Ft	Time	M	Ft	Time	M	Ft	Rise	Set	Rise	Set				
1 Mon	0224	8.5	27.8	1451	8.2	27.0	0918	2.4	7.7	2136	2.6	8.4	0521	1902	1249	2153	●
2 Tue	0310	8.1	26.6	1545	7.9	26.0	1003	2.7	8.9	2230	2.9	9.5	0623	1900	1354	2239	●
3 Wed	0412	7.7	25.4	1638	7.7	25.2	1106	3.0	9.9	2347	3.0	10.0	0625	1857	1453	2335	●
4 Thu	0537	7.5	24.7	1825	7.8	25.5				1236	3.1	10.0	0626	1855	1546		
5 Fri	0708	7.8	25.5	1942	8.2	27.0	0118	2.6	9.2	1401	2.7	8.8	0528	1852	1631	0041	●
6 Sat	0821	8.3	27.3	2047	8.9	29.1	0236	2.2	7.9	1509	2.1	6.9	0530	1850	1710	0156	●
7 Sun	0921	8.9	29.3	2141	9.5	31.0	0343	1.6	5.2	1600	1.5	4.9	0531	1848	1743	0316	●
8 Mon	1011	9.4	30.9	2229	9.9	32.6	0442	1.0	3.2	1703	1.0	3.3	0533	1845	1813	0440	●
9 Tue	1057	9.8	32.1	2315	10.2	33.5	0534	0.5	1.7	1752	0.7	2.1	0535	1843	1841	0604	●
10 Wed	1142	9.9	32.5	2359	10.3	33.7	0621	0.3	0.8	1838	0.5	1.6	0537	1840	1908	0727	●
11 Thu				1224	9.9	32.3	0705	0.2	0.8	1921	0.6	1.8	0538	1838	1937	0848	●
12 Fri	0042	10.1	33.2	1305	9.6	31.5	0745	0.5	1.6	2001	0.9	2.8	0540	1836	2008	1005	●
13 Sat	0124	9.7	32.0	1345	9.2	30.2	0824	1.0	3.2	2041	1.4	4.5	0542	1833	2043	1118	●
14 Sun	0206	9.2	30.2	1427	8.7	28.6	0901	1.6	5.4	2123	2.0	6.5	0544	1831	2123	1225	●
15 Mon	0251	8.6	28.1	1513	8.2	26.9	0939	2.3	7.7	2210	2.6	8.6	0545	1828	2209	1324	●
16 Tue	0343	7.9	26.0	1612	7.6	25.1	1027	3.0	9.8	2312	3.2	10.3	0547	1826	2300	1415	●
17 Wed	0451	7.4	24.1	1730	7.3	24.0	1134	3.5	11.4				0549	1823	2355	1458	●
18 Thu	0517	7.1	23.4	1856	7.4	24.1	0035	3.4	11.0	1302	3.6	11.8	0551	1821		1534	●
19 Fri	0739	7.3	24.1	2007	7.7	26.3	0154	3.2	10.9	1418	3.3	10.9	0552	1818	0654	1605	●
20 Sat	0939	7.8	25.5	2059	8.2	26.8	0256	2.6	9.0	1515	2.9	9.5	0554	1816	0756	1632	●
21 Sun	0924	8.2	26.3	2139	8.6	28.1	0346	2.3	7.6	1556	2.5	8.1	0556	1813	0859	1656	●
22 Mon	1000	8.6	28.1	2216	8.9	29.1	0429	2.0	6.4	1635	2.1	7.0	0558	1811	0943	1718	●
23 Tue	1032	8.9	29.1	2247	9.1	29.8	0504	1.7	5.5	1709	1.8	6.0	0559	1809	1007	1739	●
24 Wed	1103	9.1	29.7	2316	9.2	30.2	0569	1.5	4.9	1742	1.6	5.2	0601	1806	1013	1801	●
25 Thu	1133	9.2	30.1	2346	9.3	30.3	0636	1.4	4.4	1815	1.5	4.8	0603	1804	1020	1824	●
26 Fri				1204	9.2	30.2	0641	1.3	4.3	1849	1.4	4.7	0605	1801	0827	1850	●
27 Sat	0016	9.2	30.2	1236	9.2	30.0	0713	1.4	4.6	1924	1.5	5.1	0606	1799	0934	1919	●
28 Sun	0051	9.1	29.8	1309	9.0	29.6	0758	1.8	5.8	0608	1.756	5.8	0608	1756	1041	1955	●
29 Mon	0124	8.9	29.1	1347	8.6	28.8	0818	1.9	6.3	0610	1.754	6.8	0610	1754	1146	2037	●
30 Tue	0204	8.6	28.2	1430	8.5	27.8	0854	2.3	7.5	2117	2.4	8.0	0612	1752	1246	2128	●

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LAVER'S LIVERPOOL (Gladstone) TIDES OCTOBER 2014

All times shown are GMT - add one hour from 0100 30 March to 0100 26 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER			LOW WATER			SUN MOON										
	Time	M	Ft	Time	M	Ft	Time	M	Ft	Rise	Set	Rise	Set				
1 Wed	0252	8.2	28.9	1525	8.1	28.6	0940	2.7	8.9	2212	2.8	9.1	0613	1749	1340	2229	1933
2 Thu	0357	7.8	26.6	1639	7.8	26.7	1045	3.1	10.0	2350	2.9	9.6	0615	1747	1426	2338	●
3 Fri	0524	7.6	24.9	1805	7.9	25.9				1215	3.1	10.2	0617	1744	1506		
4 Sat	0653	7.8	25.7	1924	8.3	27.3	0100	2.7	8.9	1341	2.8	9.0	0619	1742	1540	0063	●
5 Sun	0806	8.4	27.5	2027	8.9	29.2	0218	2.2	7.1	1450	2.2	7.1	0621	1740	1610	0214	●
6 Mon	0903	9.0	29.4	2121	9.5	31.0	0324	1.6	5.1	1550	1.6	5.2	0622	1737	1639	0334	●
7 Tue	0953	9.4	30.9	2209	9.9	32.7	0422	1.0	3.4	1643	1.1	3.7	0624	1735	1706	0457	●
8 Wed	1037	9.7	31.9	2254	10.1	33.1	0512	0.7	2.2	1731	0.8	2.6	0626	1732	1734	0618	1051
9 Thu	1119	9.9	32.3	2337	10.1	33.7	0557	0.5	1.7	1815	0.7	2.2	0628	1730	1804	0738	●
10 Fri				1200	9.8	32.1	0639	0.6	1.9	1857	0.8	2.5	0630	1728	1838	0854	●
11 Sat	0019	9.9	32.5	1239	9.6	31.4	0718	0.8	2.8	1937	1.1	3.4	0631	1725	1917	1006	●
12 Sun	0100	9.5	31.3	1318	9.2	30.2	0754	1.3	4.3	2016	1.5	5.0	0633	1723	2001	1110	●
13 Mon	0139	9.0	29.7	1357	8.8	28.8	0829	1.9	6.2	2056	2.1	6.9	0635	1721	2051	1206	●
14 Tue	0221	8.5	27.8	1439	8.3	27.2	0904	2.6	8.3	2134	2.7	8.6	0637	1718	2146	1293	●
15 Wed	0309	7.9	25.9	1533	7.8	25.5	0944	3.1	10.2	2234	3.2	10.4	0639	1716	2244	1333	1913
16 Thu	0412	7.4	24.1	1643	7.4	24.2	1041	3.6	11.8	2350	3.4	11.3	0641	1714	2345	1406	●
17 Fri	0531	7.1	23.2	1806	7.3	23.9				1208	3.8	12.5	0642	1712		1434	●
18 Sat	0653	7.2	23.6	1921	7.5	24.7	0109	3.3	11.0	1332	3.6	11.8	0644	1709	0048	1459	●
19 Sun	0759	7.6	24.9	2019	7.9	26.0	0215	3.0	9.8	1433	3.2	10.5	0646	1707	0151	1522	●
20 Mon	0847	8.1	26.4	2103	8.4	27.5	0306	2.6	8.4	1520	2.7	8.9	0648	1705	0255	1544	●
21 Tue	0926	8.5	27.8	2141	8.7	28.6	0350	2.2	7.1	1600	2.3	7.5	0650	1703	0401	1635	●
22 Wed	1000	8.8	28.9	2215	9.0	29.5	0427	1.8	6.0	1637	1.9	6.3	0652	1701	0507	1628	●
23 Thu	1033	9.1	29.8	2248	9.2	30.1	0503	1.6	5.2	1714	1.7	5.4	0654	1698	0615	1653	2156
24 Fri	1105	9.3	30.4	2321	9.3	30.4	0539	1.4	4.6	1751	1.5	4.8	0656	1696	0724	1721	●
25 Sat	1138	9.4	30.7	2355	9.3	30.4	0615	1.3	4.4	1828	1.4	4.6	0657	1694	0832	1755	●
26 Sun				1213	9.4	30.7	0650	1.4	4.5	1905	1.5	4.8	0659	1692	0939	1836	●
27 Mon	0030	9.2	30.2	1251	9.3	30.4	0725	1.6	5.1	1943	1.6	5.3	0701	1690	1041	1925	●
28 Tue	0109	9.0	29.6	1331	9.1	29.7	0801	1.8	6.0	2023	1.9	6.2	0703	1688	1137	2022	●
29 Wed	0154	8.7	28.6	1418	8.7	28.7	0841	2.2	7.2	2109	2.2	7.2	0705	1686	1225	2128	●
30 Thu	0245	8.4	27.4	1515	8.4	27.5	0929	2.6	8.2	2206	2.5	8.2	0707	1684	1307	2241	●
31 Fri	0350	8.0	26.1	1626	8.1	26.7	1033	2.9	9.6	2320	2.7	8.7	0709	1682	1341	2357	0249

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NOVEMBER 2014 LAVER'S LIVERPOOL (Gladstone) TIDES

All times shown are GMT - add one hour from 0100 30 March to 0100 26 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER			LOW WATER			SUN MOON										
	Time	M	Ft	Time	M	Ft	Time	M	Ft	Rise	Set	Rise	Set				
1 Sat	0511	7.8	25.6	1745	8.1	26.7	1157	3.0	9.9			0711	1640	1412			
2 Sun	0553	8.0	26.1	1800	8.4	27.6	0042	2.5	8.2	1318	2.7	9.0	0713	1638	1440	0115	●
3 Mon	0745	8.4	27.5	2005	8.9	29.0	0155	2.1	7.0	1427	2.3	7.4	0715	1636	1506	0234	●
4 Tue	0842	8.9	29.0	2101	9.3	30.4	0301	1.7	5.5	1527	1.8	5.9	0717	1634	1533	0354	●
5 Wed	0933	9.2	30.3	2150													

JANUARY 2015 LAVER'S LIVERPOOL (Gladstone) TIDES

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER				LOW WATER				SUN MOON			
	Morning		Afternoon		Morning		Afternoon		Rise	Set	Rise	Set
	Time	M Ft	Time	M Ft	Time	M Ft	Time	M Ft	Time	Time	Time	Time
1 Thu	0754	8.1 26.7	2020	8.4 27.4	0206	2.4 7.9	1441	2.5 8.1	0828	1603	1343	0423
2 Fri	0854	8.4 27.7	2118	8.6 28.1	0311	2.3 7.4	1543	2.2 7.7	0828	1604	1424	0628
3 Sat	0945	8.7 28.6	2207	8.8 28.8	0406	2.1 6.8	1637	1.9 6.2	0828	1606	1511	0627
4 Sun	1030	9.0 29.4	2251	8.9 29.2	0454	1.9 6.2	1724	1.7 5.5	0827	1607	1605	0718
5 Mon	1109	9.1 29.9	2329	9.0 29.5	0534	1.8 5.8	1806	1.6 5.2	0827	1608	1703	0801
6 Tue	1145	9.2 30.2			0610	1.7 5.7	1843	1.5 5.1	0826	1609	1805	0837
7 Wed	0004	9.0 29.5	1220	9.2 30.1	0643	1.8 5.7	1917	1.6 5.3	0826	1611	1908	0908
8 Thu	0038	8.9 29.2	1253	9.1 29.8	0714	1.8 6.0	1948	1.7 5.7	0825	1612	2012	0934
9 Fri	0112	8.6 28.9	1326	8.9 29.3	0744	2.0 6.5	2018	1.9 6.3	0825	1614	2116	0957
10 Sat	0145	8.6 28.1	1400	8.7 28.5	0815	2.2 7.2	2049	2.2 7.1	0824	1615	2219	1019
11 Sun	0221	8.3 27.2	1436	8.4 27.5	0850	2.5 8.0	2124	2.5 8.1	0824	1617	2324	1040
12 Mon	0300	8.0 26.2	1515	8.1 26.4	0929	2.8 9.1	2205	2.8 9.1	0823	1618		1101
13 Tue	0345	7.7 25.2	1603	7.7 25.3	1015	3.1 10.2	2256	3.1 10.1	0822	1620	0029	1124
14 Wed	0441	7.4 24.3	1705	7.5 24.5	1115	3.4 11.0	0821	1621	0126	1621	0135	1150
15 Thu	0551	7.3 24.1	1821	7.4 24.3	0003	3.2 10.6	1232	3.4 11.2	0820	1623	0242	1220
16 Fri	0706	7.5 24.7	1935	7.7 25.1	0123	3.1 10.2	1351	3.1 10.2	0819	1625	0350	1257
17 Sat	0811	8.0 26.2	2038	8.1 26.6	0232	2.7 8.9	1459	2.6 8.6	0818	1626	0455	1343
18 Sun	0906	8.5 28.0	2132	8.6 28.2	0331	2.2 7.3	1557	2.1 6.8	0817	1628	0557	1439
19 Mon	0956	9.1 29.7	2221	9.1 29.8	0424	1.7 5.7	1651	1.5 5.0	0816	1630	0651	1546
20 Tue	1042	8.5 31.2	2308	9.6 31.0	0515	1.3 4.3	1743	1.1 3.4	0815	1632	0738	1702
21 Wed	1126	9.9 32.4	2354	9.7 31.8	0603	1.0 3.2	1833	0.7 2.3	0814	1633	0817	1823
22 Thu			1214	10.1 33.1	0649	0.8 2.5	1919	0.5 1.6	0812	1635	0851	1946
23 Fri	0040	9.8 32.0	1300	10.1 33.1	0734	0.7 2.4	2004	0.5 1.6	0811	1637	0921	2108
24 Sat	0126	9.6 31.6	1346	9.9 32.6	0818	0.9 3.0	2048	0.7 2.4	0810	1639	0948	2229
25 Sun	0212	9.3 30.6	1433	9.6 31.6	0901	1.2 4.0	2132	1.2 4.0	0808	1641	1015	2347
26 Mon	0300	8.9 29.2	1523	9.1 30.0	0947	1.7 5.5	2216	1.7 5.6	0807	1643	1042	
27 Tue	0353	8.4 27.6	1620	8.5 28.1	1039	2.2 7.3	2313	2.3 7.5	0806	1645	1112	0103
28 Wed	0456	8.0 26.1	1727	8.1 26.5	1143	2.7 8.7			0804	1647	1146	0214
29 Thu	0610	7.7 25.2	1845	7.8 25.6	0020	2.7 8.9	1300	2.9 9.4	0802	1648	1225	0321
30 Fri	0729	7.7 25.3	2001	7.9 25.8	0137	2.8 9.3	1419	2.8 9.3	0801	1650	1309	0421
31 Sat	0838	8.0 26.2	2105	8.1 26.6	0250	2.7 8.9	1529	2.4 8.0	0759	1652	1400	0514

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LAVER'S LIVERPOOL (Gladstone) TIDES FEBRUARY 2015

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER				LOW WATER				SUN MOON			
	Morning		Afternoon		Morning		Afternoon		Rise	Set	Rise	Set
	Time	M Ft	Time	M Ft	Time	M Ft	Time	M Ft	Time	Time	Time	Time
1 Sun	0933	8.4 27.5	2156	8.4 27.6	0351	2.4 7.9	1626	2.1 6.8	0758	1654	1455	0600
2 Mon	1017	8.7 28.5	2238	8.7 28.4	0439	2.1 7.0	1712	1.8 5.9	0756	1656	1555	0636
3 Tue	1055	9.0 29.4	2313	8.9 29.0	0520	1.9 6.2	1751	1.6 5.2	0754	1658	1658	0710
4 Wed	1129	9.1 29.9	2346	9.0 29.4	0554	1.7 5.7	1825	1.5 4.9	0752	1700	1801	0738
5 Thu			1201	9.2 30.1	0624	1.6 5.3	1855	1.4 4.7	0751	1702	1905	0803
6 Fri	0017	9.0 29.5	1233	9.2 30.1	0653	1.5 5.2	1924	1.5 4.8	0749	1704	2008	0825
7 Sat	0048	8.9 29.3	1303	9.1 29.7	0723	1.6 5.3	1952	1.6 5.2	0747	1706	2112	0846
8 Sun	0119	8.8 28.9	1333	8.9 29.1	0753	1.7 5.7	2021	1.8 5.8	0745	1708	2217	0907
9 Mon	0150	8.6 28.2	1403	8.6 28.3	0826	2.0 6.5	2053	2.1 6.8	0743	1710	2321	0930
10 Tue	0223	8.3 27.3	1436	8.3 27.4	0900	2.3 7.5	2127	2.4 7.9	0741	1712		0954
11 Wed	0300	8.0 26.3	1516	8.0 26.2	0939	2.7 8.7	2209	2.8 9.2	0739	1714	0027	1022
12 Thu	0348	7.7 25.2	1609	7.6 25.0	1028	3.0 9.9	2306	3.1 10.2	0737	1716	0132	1054
13 Fri	0452	7.4 24.3	1724	7.4 24.1	1137	3.3 10.7			0735	1718	0237	1134
14 Sat	0615	7.4 24.3	1854	7.4 24.4	0030	3.2 10.6	1307	3.2 10.4	0733	1720	0338	1224
15 Sun	0736	7.8 25.4	2011	7.9 25.9	0156	2.9 9.6	1428	2.7 8.8	0731	1722	0435	1323
16 Mon	0841	8.3 27.4	2112	8.5 27.9	0305	2.4 7.8	1535	2.1 6.7	0729	1724	0525	1433
17 Tue	0936	9.0 29.5	2205	9.1 29.8	0404	1.8 5.8	1634	1.4 4.8	0727	1726	0608	1508
18 Wed	1025	9.6 31.3	2253	9.5 31.3	0458	1.2 4.0	1728	0.8 2.6	0725	1728	0645	1573
19 Thu	1112	10.0 32.8	2338	9.8 32.3	0548	0.8 2.5	1818	0.4 1.7	0723	1730	0718	1637
20 Fri	1157	10.3 33.6			0635	0.4 1.4	1903	0.1 0.4	0721	1732	0747	2002
21 Sat	0023	9.9 32.6	1242	10.3 33.8	0718	0.3 1.1	1946	0.2 0.5	0719	1734	0815	2124
22 Sun	0106	9.8 32.2	1327	10.1 33.1	0801	0.5 1.6	2027	0.5 1.5	0716	1736	0844	2244
23 Mon	0150	9.5 31.2	1411	9.7 31.8	0842	0.9 2.8	2108	1.0 3.3	0714	1738	0914	0000
24 Tue	0233	9.1 29.7	1457	9.1 30.0	0924	1.4 4.6	2149	1.7 5.6	0712	1740	0947	
25 Wed	0321	8.5 27.9	1549	8.5 27.8	1012	2.0 7.0	2238	2.4 7.8	0710	1742	1015	0110
26 Thu	0419	7.9 26.0	1654	7.8 25.7	1112	2.6 8.6	2342	3.0 9.7	0708	1743	1108	0214
27 Fri	0533	7.5 24.6	1815	7.4 24.4	1230	3.0 9.8	2430	3.0 9.8	0706	1745	1157	0310
28 Sat	0658	7.4 24.3	1939	7.5 24.5	0105	3.2 10.5	1355	2.9 9.6	0703	1747	1251	0358

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MARCH 2015 LAVER'S LIVERPOOL (Gladstone) TIDES

All times shown are GMT - add one hour from 0100 29 March to 0100 25 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter

Date	HIGH WATER				LOW WATER				SUN MOON			
	Morning		Afternoon		Morning		Afternoon		Rise	Set	Rise	Set
	Time	M Ft	Time	M Ft	Time	M Ft	Time	M Ft	Time	Time	Time	Time
1 Sun	0815	7.7 25.2	2048	7.8 25.6	0226	3.0 9.9	1509	2.6 8.5	0701	1749	1349	0438
2 Mon	0913	8.1 26.6	2139	8.2 26.8	0331	2.7 8.7	1606	2.2 7.2	0658	1751	1450	0512
3 Tue	0957	8.5 27.9	2218	8.5 28.0	0421	2.3 7.5	1651	1.8 6.0	0656	1753	1553	0542
4 Wed	1034	8.8 28.8	2251	8.8 28.8	0459	2.0 6.5	1728	1.6 5.2	0654	1755	1656	0607
5 Thu	1107	9.0 29.5	2323	8.9 29.3	0532	1.7 5.6	1800	1.4 4.6	0651	1757	1800	0630
6 Fri	1138	9.1 29.9	2353	9.0 29.6	0601	1.5 5.0	1829	1.3 4.3	0649	1759	1903	0652
7 Sat			1208	9.2 30.0	0630	1.4 4.6	1857	1.3 4.2	0647	1801	2008	0714
8 Sun	0022	9.0 29.7	1238	9.1 29.8	0700	1.4 4.4	1926	1.3 4.4	0644	1802	2112	0735
9 Mon	0052	9.0 29.4	1306	9.0 29.4	0732	1.4 4.7	1955	1.5 5.0	0642	1804	2217	0759
10 Tue	0122	8.8 28.9	1336	8.8 28.7	0803	1.6 5.4	2026	1.8 5.9	0640	1806	2322	0825
11 Wed	0154	8.6 28.2	1408	8.5 27.9	0837	1.9 6.4	2058	2.2 7.1	0637	1808		0856
12 Thu	0230	8.3 27.3	1447	8.2 26.9	0913	2.3 7.5	2136	2.6 8.4	0635	1810	0025	0932
13 Fri	0315	8.0 26.1	1538	7.8 25.5	0958	2.7 8.8	2227	3.0 9.7	0632	1812	0127	1017
14 Sat	0415	7.6 25.0	1650	7.4 24.4	1102	3.0 9.8	2346	3.2 10.5	0630	1814	0223	1110
15 Sun	0538	7.5 24.5	1824	7.4 24.3	1231	3.0 9.8	0628	1816	0315	1212		
16 Mon	0704	7.7 25.4	1947	7.9 25.8	0122	3.0 9.8	1400	2.6 8.5	0625	1817	0359	1323
17 Tue	0816	8.3 27.3	2052	8.5 27.8	0239	2.4 8.0	1512	1.9 6.3	0623	1819	0438	1441
18 Wed	0914	9.0 29.4	2145	9.1 29.8	0342	1.8 5.8	1614	1.3 4.7	0620	1821	0512	1603
19 Thu	1005	9.6 31.4	2233	9.5 31.4	0438	1.2 3.8	1709	0.7 2.2	0618	1823	0543	1727
20 Fri	1052	10.0 32.8	2318	9.9 32.4	0529	0.7 2.1	1757	0.2 0.8	0616	1825	0612	1851
21 Sat	1137	10.2 33.6			0615	0.3 1.0	1842	0.1 0.2	0613	1827	0641	2015
22 Sun	0002	10.0 32.7	1221	10.2 33.6	0659	0.2 0.7	1924	0.1 0.5	0611	1828	0711	2135
23 Mon	0044	9.9 32.3	1305	10.0 32.8	0741	0.4 1.1	2003	0.5 1.6	0608	1830	0744	2251
24 Tue	0126	9.6 31.3	1348	9.6 31.4	0821	0.7 2.4	2042	1.1 3.5	0606	1832	0821	0000
25 Wed	0208	9.1 29.8	1432	9.0 29.5	0903	1.3 4.3	2121	1.8 5.8	0603	1834	0903	
26 Thu	0252	8.6 28.1	1521	8.3 27.3	0948							

2.5 SNH field code maps

A field code system has been used by SNH to cover all of the fields within the Management Scheme area typically used by the geese (**Figures 4-11**). These are the codes used in the results tables. Where geese were recorded in an uncoded field, the coding was extended in a logical and consecutive manner. The figures are ordered in a sequence from east (Priestside area) to west (Colvend area).

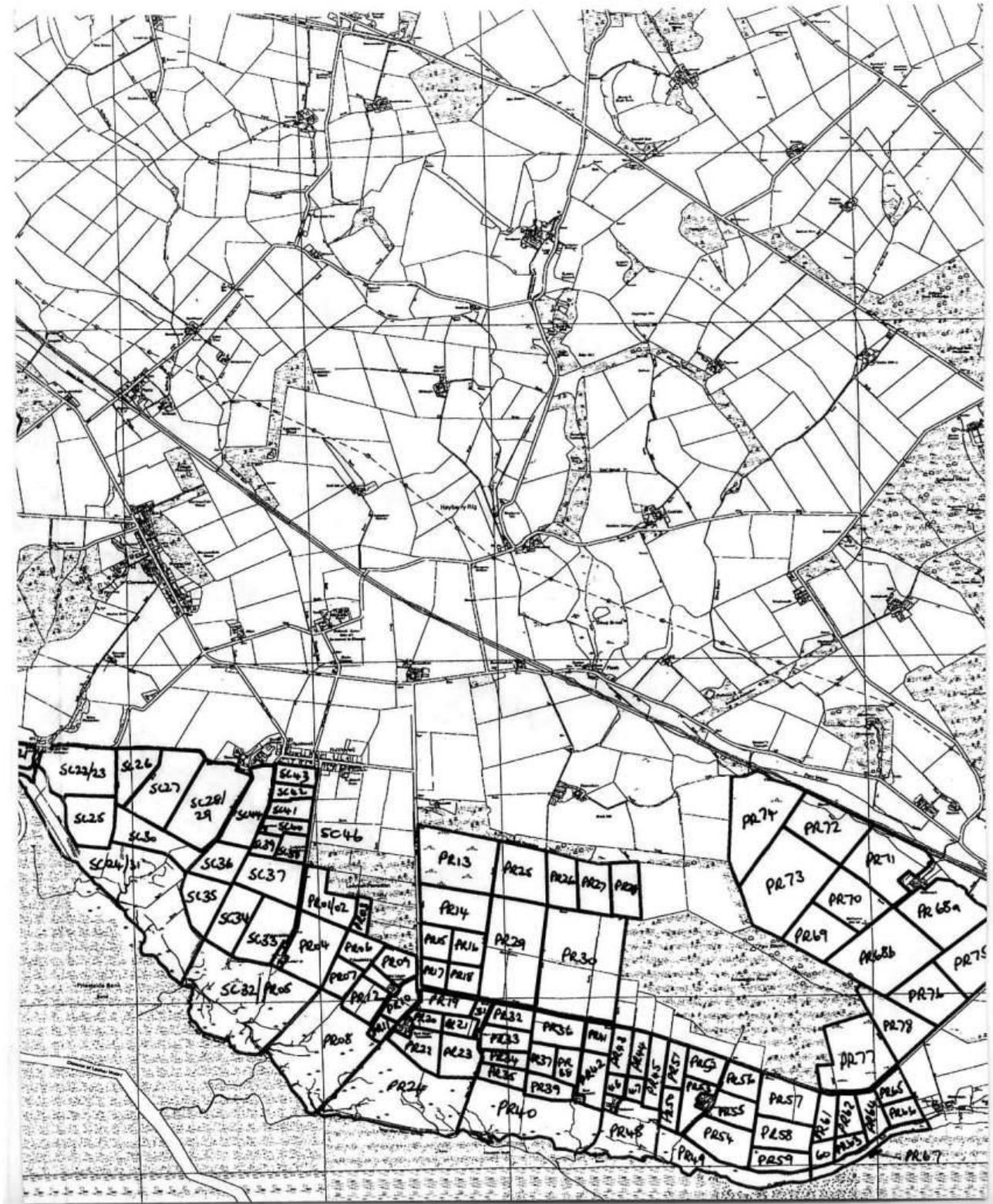


Figure 4. Field codes for the Priestside/Hurkledale/Thwaite area of the Goose Management Scheme.

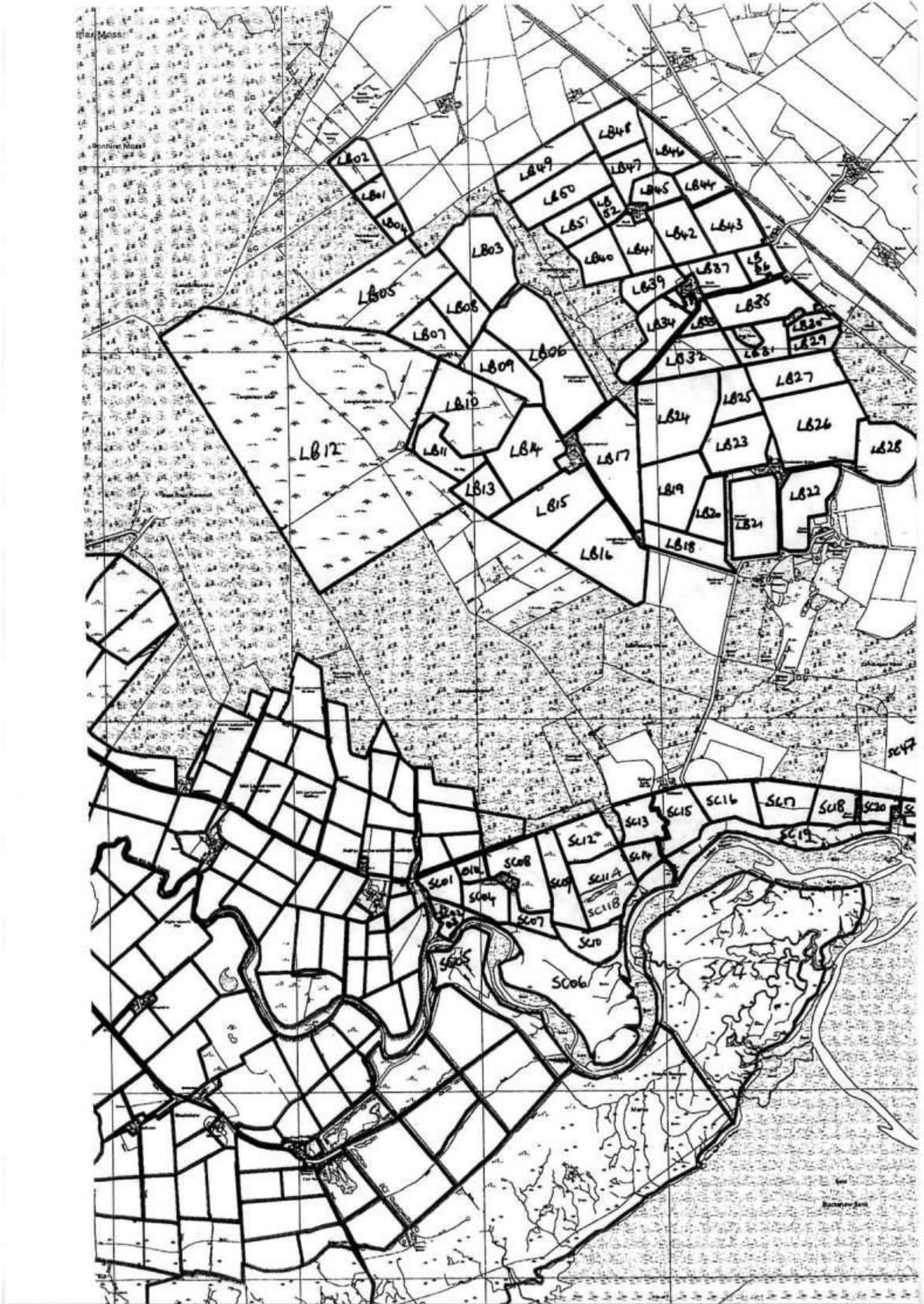


Figure 5. Field codes for the Powhillon/Stanhope/Longbridgemuir area of the Goose Management Scheme.

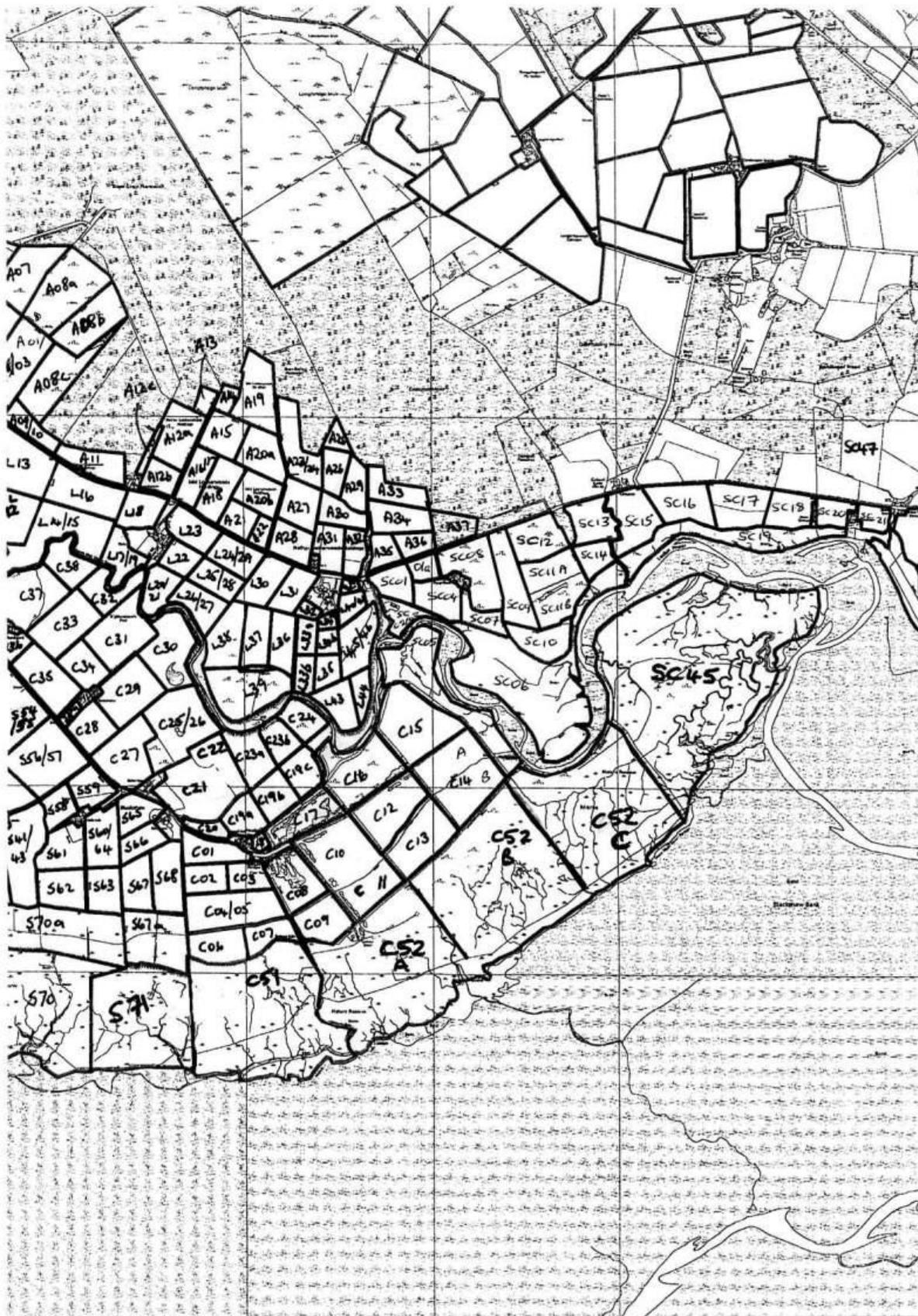


Figure 6. Field codes for the Caerlaverock/Nether Locharwoods area of the Goose Management Scheme.

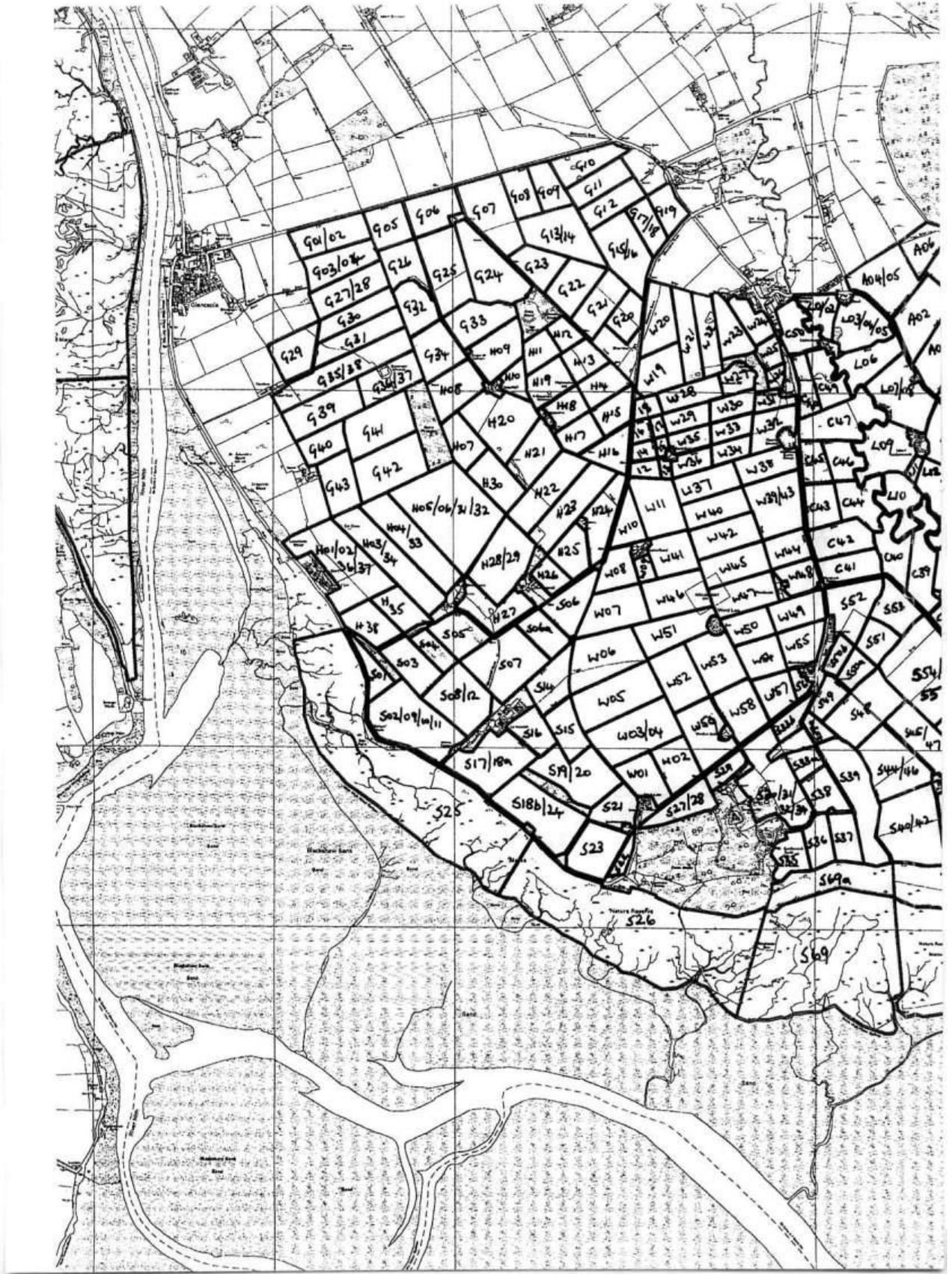


Figure 7. Field codes for the Lantonside/Ward Law area of the Goose Management Scheme.

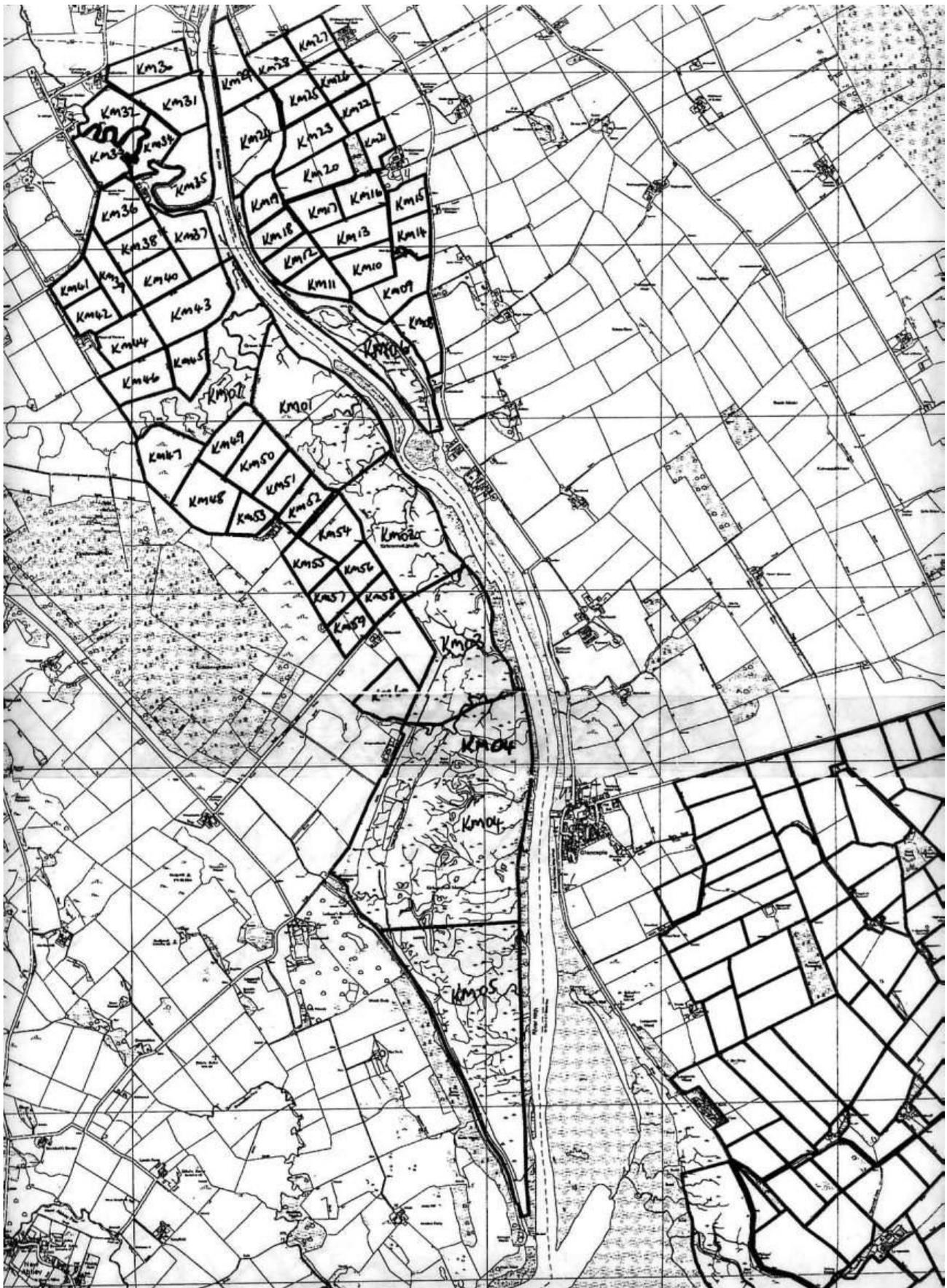


Figure 8. Field codes for the Kelton/Greenmerse/Kirkconnell area of the Goose Management Scheme.

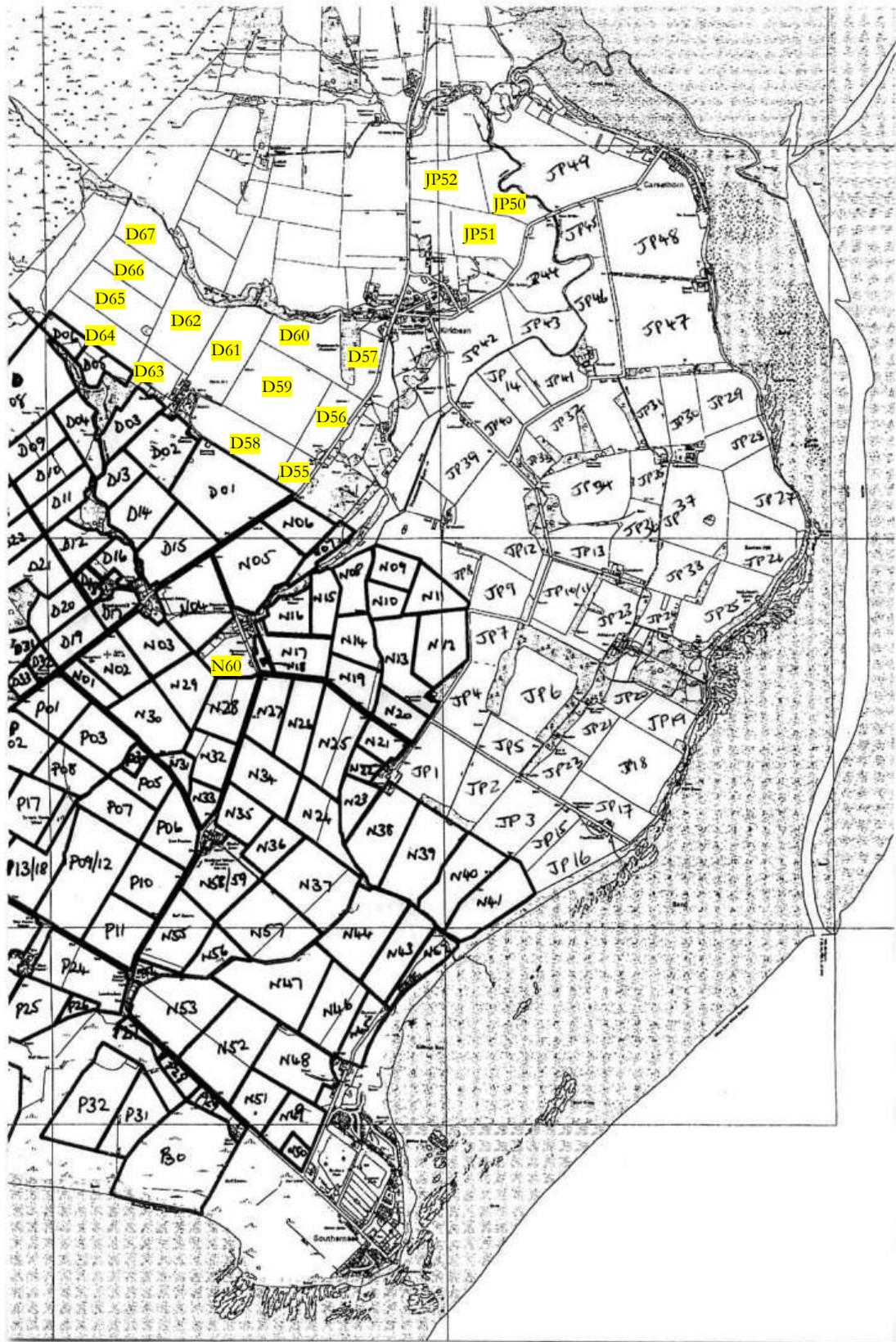


Figure 9. Field codes for the Carsethorn/Southernness area of the Goose Management Scheme (new field codes in areas used by the geese more regularly since 2008-2009 are shown highlighted).

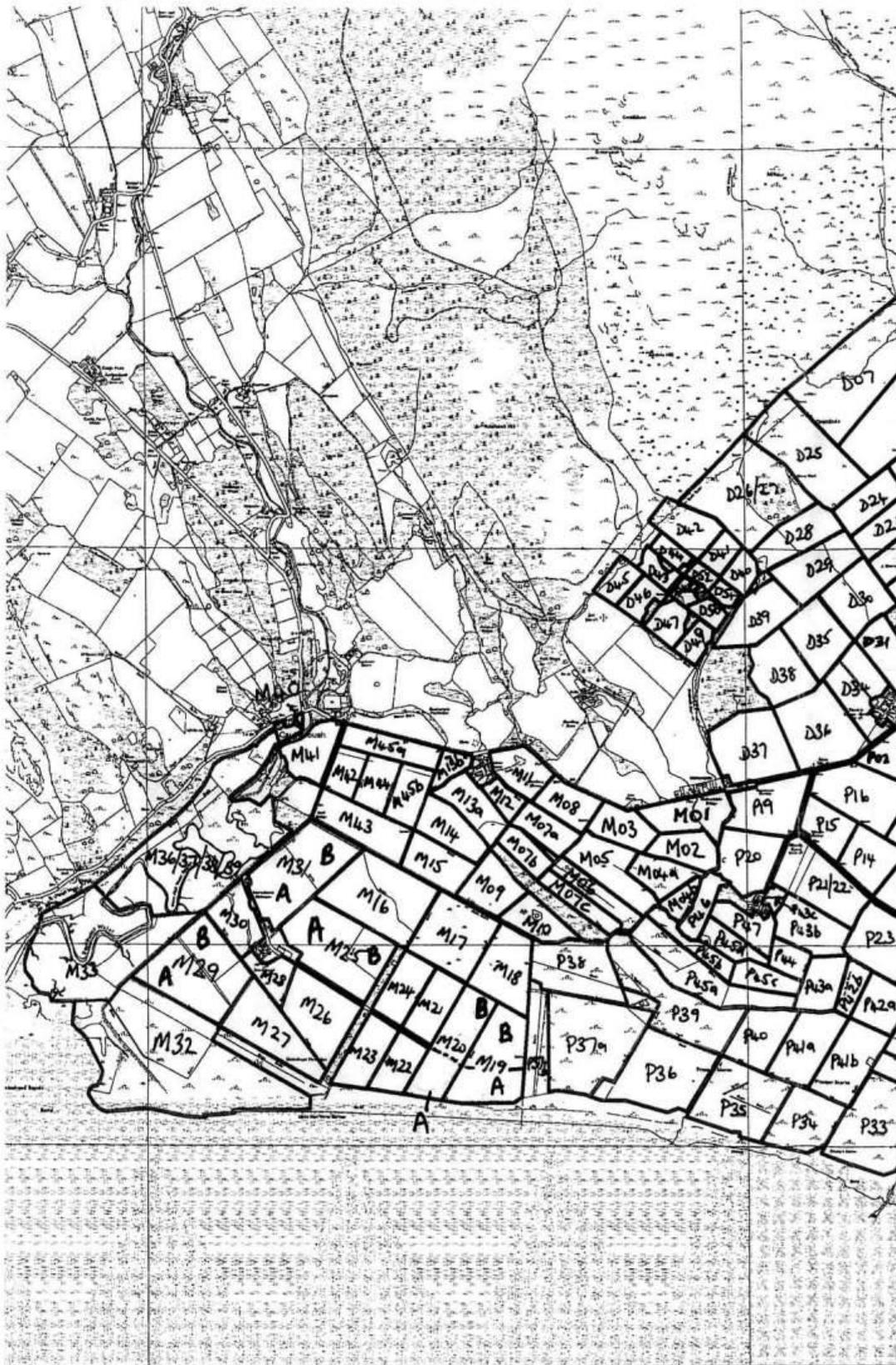


Figure 10. Field codes for the West Preston/Cowcourse/Mersehead area of the Goose Management Scheme.

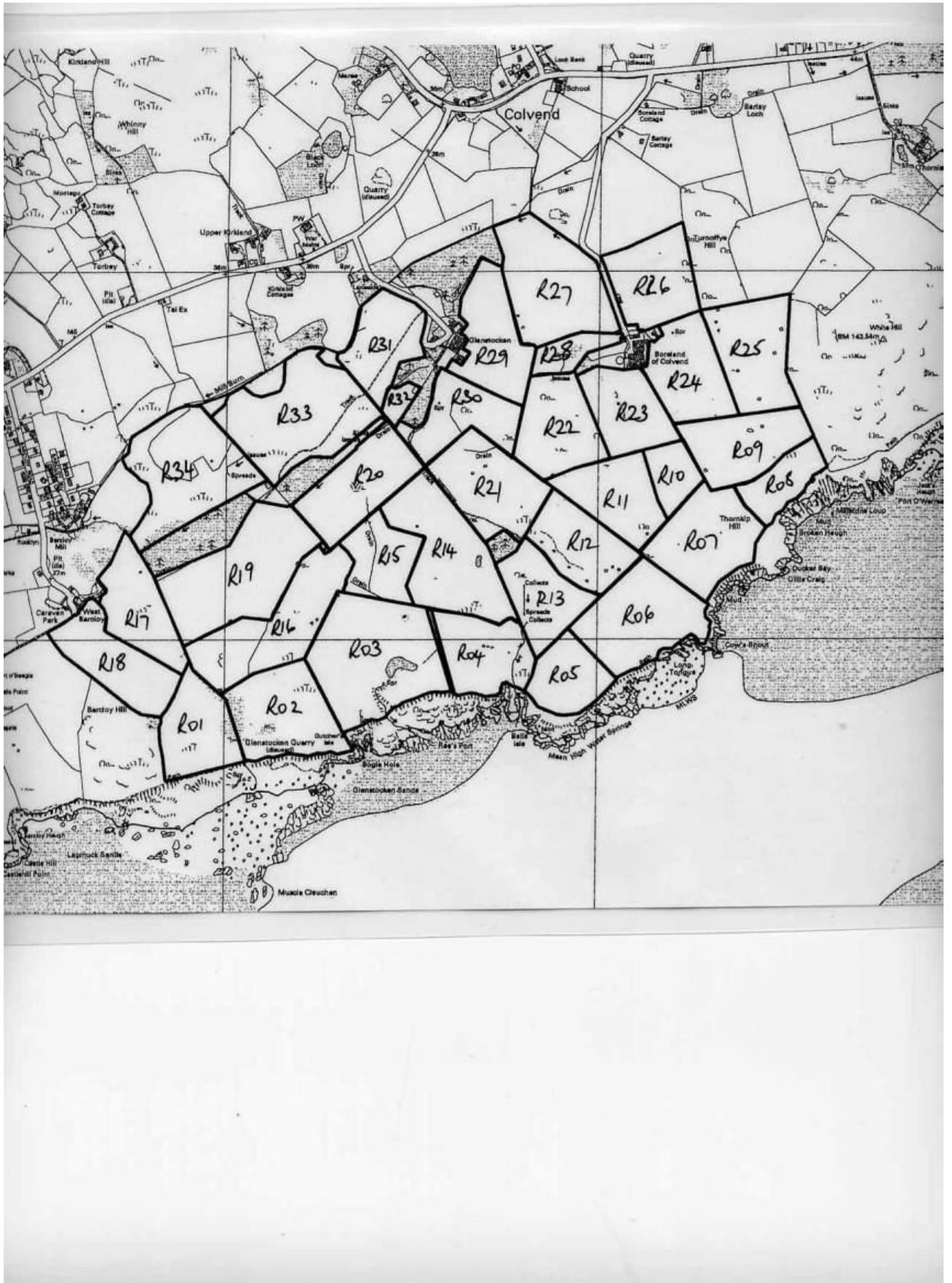


Figure 11. Field codes for the Boreland of Colvend/Glenstocken area of the Goose Management Scheme.

3 Results

3.1 Barnacle Goose counts within the Management Scheme area

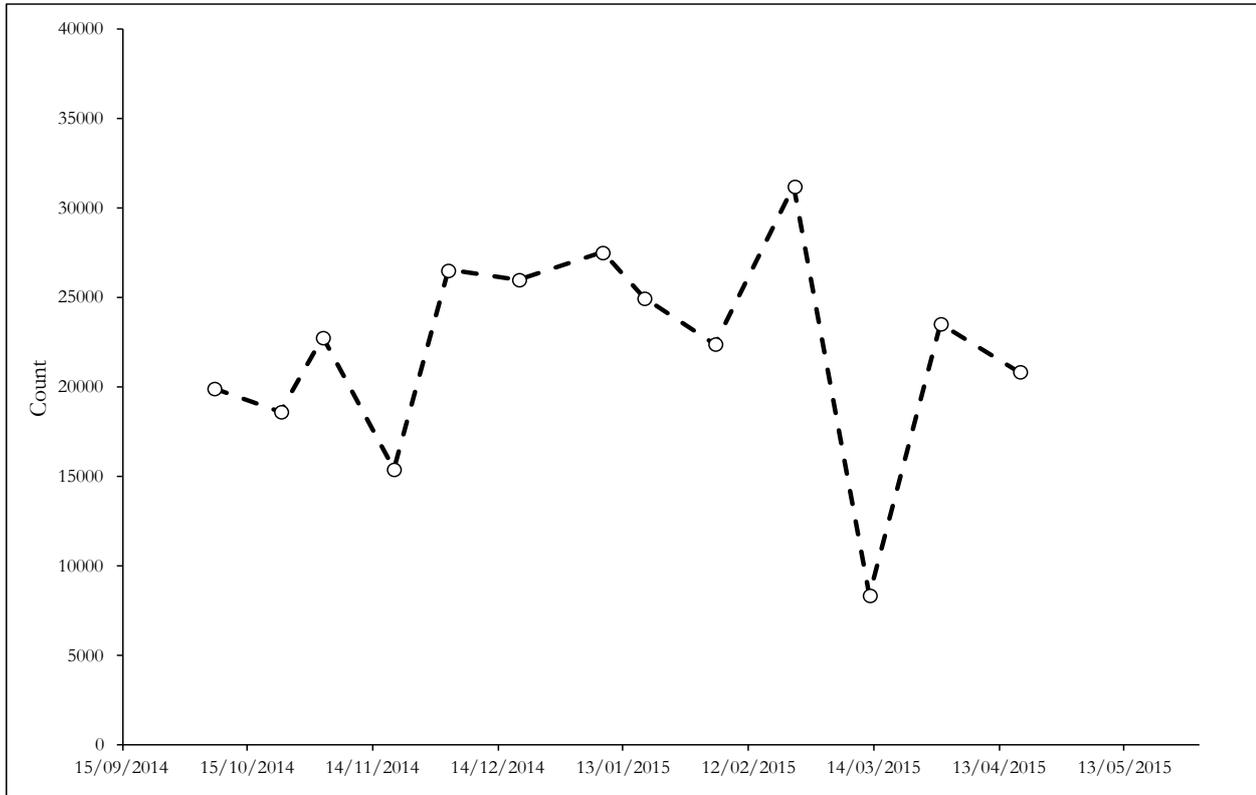


Figure 12. Svalbard Barnacle Goose route count totals within the Management Scheme area.

Some goose count totals for the Scheme area are greater than others because double counting of flocks that move between fields often occurs over the course of a route count. The methodology does not seek to remove this bias as the aim is to record the numbers of geese using individual fields. Fluctuations in goose numbers within the Scheme area also occur due to the effect of high tides pushing geese off low lying saltmarsh areas on the south side of the Solway and due to geese dispersing mid-winter, after peak arrival, to foraging areas outside the Scheme area (**Figure 12**).

The mean number of geese recorded during the route counts was 22,165 for the period from the start of October (when the contract started) to the middle of April (18,809 in 2013-2014) ranging from a minimum of 8,350 on 13 March 2015 up to a maximum of 31,229 on 23 February 2015 (26,665 in 2013-2014), two days after extremely high tides pushed birds from the Cumbrian marshes (**Figure 3**). On the final route count on 18 April 2015, 20,858 geese were still present within the Scheme area. During other census counts and monitoring the last 18 were recorded in the Caerlaverock area on 6 May as the birds moved east to congregate on Rockcliffe Marsh, Cumbria, prior to spring departure. Overall within the Scheme area there tends to be a decline in goose use as food resources within the area are depleted by the end of January. This trend is less apparent this season because of the high count in late February due to geese being pushed into the Scheme area by the very high tides. Winter 2014-2015, as with the previous winter, was fairly benign with no periods of prolonged snow or ice cover and only 23 nights on which ground frosts were recorded (less than -1°C at WWT Caerlaverock weather station).

Flock sizes and field distribution of Barnacle Geese within the Management Scheme area are given in **Table 2**.

Table 2. Svalbard Barnacle Goose flock sizes recorded during the Management Scheme route counts.

Field code	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
A01/03										3				3
A15										380				380
A18										460				460
A34										11				11
C01					290	370	270			56				986
C02			310		620	340					10	13		1293
C03		2150	770		50			85						3055
C04/05		290	350		560		210			220		45		1675
C07					700							52		752
C08			14				90							104
C10/11	880						290			77				1247
C12						3550	2060			440			347	6397
C13				1170	260					280				1710
C14	90						550			390				1030
C15	145	85				650	1							881
C16				390										390
C17					10		5							15
C19a	15	270	45		205			190	4	130		24		883
C19b	1670		120				550					800	63	3203
C19c				180	1700		780					1200		3860
C20				1300	460					32		65		1857
C21/22					125	120	110			740		90		1185
C23a					640							1960		2600
C23b					1450		260			220		130		2060
C24							7					4		11
C25/26			1860		260	1830								3950
C27					570	630		990						2190
C28				410	140		135			176		1		862
C29			160			460	135			12				767
C30	35	35			600		2150							2820
C31			610		1120		2150						630	4510
C33		68	290											358
C34				1240										1240
C42								26	80					106
C51/S71	1150	1370	2560	10		250		1240	130		1960	740	1270	10680
C52	2070	3200	810	610	220	210	400	1260			880	140	4800	14600
Drumburn Merse			530			360		260			410	640	270	2470
JP03								1040		3380				4420
JP17		260												260
JP18						55								55
JP22		6												6
JP44						120								120
JP48					2		2	6				35		45
JP49		190	210			160					430	1050		2040
KM01							330					1530		1860
KM02		2250											310	2560
KM03						1280						1290		2570
KM04			3260	300				960			900	1460		6880
KM05								2800			15			2815
KM06			92		180	18					650			940
KM11						780								780
KM12													460	460
KM16		2250												2250
KM31						13	2							15
KM32											80			80
KM43							2300		6					2306
KM45							2300							2300
KM49					680				210				730	1620
KM50							330		60					390
KM58					1460									1460
KM60										13				13
L09							180							180
L26/27							140							140
L30							4							4
L37							1210					22		1232
L43					460								2	462
LB16						1880								1880
M01									8					8
M03						355								355
M07b						240						460		700
M07c									2650					2650
M11							53							53
M12									172			520		692
M13b						162								162
M15	470		1450			120	70							2110
M16	640	188		15				9				190		1042
M18												60		60

M19										450			35	485
M20			45	62								340	340	787
M21										120			26	146
M22		490					140							630
M23						280						110		390
M24							280					7		287
M25	2930	380	1610			65	90		540			130	95	5840
M26		235		159		28	70		390	250	260	650	85	2127
M27						240								240
M28											13	52	98	163
M29		710	245			370							220	1545
M30		490												490
M31						190	1060	145		1055		85		2535
M32				565		610	390		310			320	460	2655
M33		7			2110			1340				120	1310	4887
M36/37/38/39				455	2	2		280		50				789
M41						7								7
M43	980	632	430	1030		70								3142
M44							3							3
M45a						1070	31			900	70			2071
M45b						65	1080			190				1335
N10					390									390
N32						4500								4500
N34								1650						1650
N37				4690										4690
N44		350					1350	170		400				2270
N53							90							90
N55					1250									1250
N58/59					1250									1250
P06		630												630
P09/12								3870						3870
P10					2615									2615
P11					1060									1060
P13/18										2640				2640
P19		7			1		530					110		648
P20					2750		1670	450				640		5510
P21/22		31		260				1110						1401
P23	3													3
P24		9	170											179
P25	4450		3750			310	320		3800			24	1	12655
P32											1620			1620
P34									600					600
P35									2990					2990
P36					1430	460	35		1710	100	70			3805
P37a						90					130			220
P38							27							27
P39													3150	3150
P40	4		360									1000	610	1974
P41a		60			150		760					2000		2970
P41b	1300		950	745								900	220	4115
P42a	180	1420		590		820	35						13	3058
P43a	160	370		590		290							9	1419
P43b													3	3
P44													25	25
P45a		120	320										140	580
P45c												38	1360	1398
P45d							42					1580	21	1643
P47				380				7				10	15	412
PR04										2				2
PR08				200										200
PR23						1060			980					2040
PR33										1210				1210
PR68a											20	105		125
PR68b									720		690		1120	2530
PR69									580					580
PR73											600			600
PR75						460								460
PR76								1380		2710				4090
R03											140			140
S18b/24									330					330
S25						11								11
S26											330			330
S39										2780				2780
S40/42										760				760
S44/46								1920	2820	520				5260
S51										1290				1290
S53	1080							85		8				1173
S54/55							180	1560		3800				5540
S56/57										660				660

S59					370					37				407
S60/64										330				330
S61									270					270
S65										790				790
S66										15				15
S68	910		85		310		12							1317
S69											1210		700	1910
S70	760							320			40	4		1124
SC04										90				90
SC06			15					8						23
SC16						780								780
SC22/23							1510							1510
SC24/31					700							980		1680
SC33										2650				2650
SC34										130				130
SC35												980		980
SC45		70	1350	50			410	1810				710		4400
W01									2					2
W03/04									3050	142				3192
Total	19922	18623	22771	15401	26530	26011	27529	24971	22412	31229	8350	23544	20858	288151

3.2 Pink-footed Goose counts for the Management Scheme area

Pink-footed Goose counts are very variable as the extent to which geese remain in the area tends to be very weather and crop dependent. Typical peak times include the autumn as geese arrive back from Iceland into the UK and from February to April as birds from further south in the UK move north again on migration. This winter the highest count totals were seen from early February (**Table 3**), and the geese remained in the Hurkledale area into early May. These geese were seen in the usual wintering areas between Carsethorn and Powillimount, Priestside and Hurkledale, Kirkconnell Merse and in the Locharwoods area with occasional flocks elsewhere.

Table 3. Pink-footed Goose flock sizes recorded during the Management Scheme route counts.

Field code	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
A01/03							4			160				164
A02						5								5
A04/05						5								5
A21									9					9
A27									340					340
A34										730				730
C27								2						2
C42								450	85					535
Drumburn Merse											300			300
H22	28													28
JP18						35								35
JP30			26											26
JP44						290								290
JP48												890		890
JP49											460	290		750
JP51					4									4
KM01												10	15	25
KM02		250												250
KM04												16	22	38
KM05												95		95
KM12											72		2	74
KM16		40												40
KM31						110	105					330		545
KM32											90			90
KM43									1460					1460
KM49									140				8	148
L09							710							710
L14/15						30								30
LB16						16								16
M25	220													220
N09									820					820
N10					1600		75							1675
N12											230			230
N34							1							1
P23	63													63
PR42												55		55
PR57										3				3
PR68a											830	150		980
PR68b									5		490		560	1055
PR69									170			5		175
PR70									220		160			380
PR73												500		500

PR75					32	180									212
S18b/24					320										320
S39									31						31
S48									22						22
S52											21				21
S53	45										330				375
S54/55							570				74				644
S68	350														350
S70	370														370
SC06											30				30
SC45											5				5
W02									4						4
W03/04									240	95		790			1125
Total	1076	290	26	0	1956	672	894	1412	3549	1305	3092	3131	607		18010

3.3 Greylag Goose counts for the Management Scheme area

Small numbers of Greylag Geese were recorded within the Scheme area, most records occurring on the ponds and fields at WWT Caerlaverock or nearby (**Table 4**). Post-moult flocks usually build up in this area during the late summer, with numbers declining from a few hundred to less than ten over the course of the winter. The pattern this winter was fairly typical with a small number of birds remaining at the WWT Caerlaverock swan feeds until the beginning of 2015 with numbers then dropping off rapidly to zero.

Table 4. Greylag Goose flock sizes recorded during the Management Scheme route counts.

Field code	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
C10/11	7													7
C17	5		7	8	12	11	19							62
C21/22			35											35
C33		8												8
KM04	1													1
M25	2													2
M45b						4								4
PR74												2		2
PR75					4									4
Total	15	8	42	8	16	15	19	0	0	0	0	2	0	125

3.4 Canada Goose counts for the Management Scheme area

Small numbers of Canada Geese were recorded within the Scheme area, most records occurring on the ponds and fields at WWT Caerlaverock or nearby (**Table 5**). As with the Greylag Geese with which they often associate in mixed flocks, post-moult flocks usually build up in this area during the late summer, with numbers declining from a few hundred to less than ten over the course of the winter. The pattern of use was typical this winter with c.100 birds coming to the swan feeds, alongside the Greylag Geese, at WWT Caerlaverock until early 2015 with numbers then dropping off rapidly to zero.

Table 5. Canada Goose flock sizes recorded during the Management Scheme route counts.

Field code	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
C17	70		85	70	75	150	70	2						522
C19b	25													25
C33		125												125
M15							1							1
M18							7							7
M25	2													2
PR75					38									38
S53	10													10
Total	107	125	85	70	113	150	78	2	0	0	0	0	0	730

3.5 Whooper Swan counts for the Management Scheme area

The Scheme area and fields at its fringe especially around WWT Caerlaverock, Kelton and Thwaite generally hold up to 500 Whooper Swans throughout the winter, with numbers increasing gradually as the swans arrive

from Iceland up to mid-November and decreasing rapidly at the end of March as birds head north on migration. Some flocks occurring on fields outside the Scheme area are noted as comments on the Excel database but do not contribute to the totals given in **Table 6**. The swan numbers this winter followed the usual arrival and departure pattern and the traditional feeding areas around Kelton, Islesteps and the Nith, Caerlaverock and Thwaite and Ruthwell were utilised.

Table 6. Whooper Swan flock sizes recorded during the Management Scheme route counts.

Field code	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
A01/03			52	17			34			10	13	8		134
C08		4	4											8
C16							1							1
C17		8	42	88	85	120	120	135	180	140	95	25		1038
C30	3													3
KM19								140						140
KM24					60									60
KM50		17												17
PR68b								4						4
PR69												8		8
S33b				12	30	12								54
SC13									25					25
SC27				3										3
SC44							5							5
SC45											14			14
Total	3	29	98	120	175	132	160	279	205	150	122	41	0	1514

3.6 Mute Swan counts for the Management Scheme area

Mute Swans mainly occur on the ponds at WWT Caerlaverock with scattered pairs elsewhere. This winter followed the usual pattern and after numbers built up at the Caerlaverock swan feeds to a peak in mid-winter, by March the birds were dispersing to breeding territories elsewhere (**Table 7**).

Table 7. Mute Swan flock sizes recorded during the Management Scheme route counts.

	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15	Total
C08	2	4	3	2										11
C16	2												2	4
C17	10	22	45	48	52	40	45	45	42	50	21	30	2	452
C52							2							2
M16													2	2
M43							2							2
PR74												2		2
Total	14	26	48	50	52	40	49	45	42	50	21	32	6	475

3.7 Deliberate disturbance to geese in the Management Scheme area

Records of disturbance activities specifically directed towards geese in the Scheme area were as follows:

- From the start of October 2014 through to the end of February 2015, there was a regular grid of canes with red and white tape streamers on them (some of which fell over with time) deployed in a late reseed of Italian Ryegrass at Newfield (C02) which, with reference to the daily Farmhouse Tower counts carried out by WWT, seemed very effective at temporarily deterring geese from this field even though many thousands used the fields around it. The geese did not start using this field until the final week of October, more than a month after the first geese arrived in the area;
- From the beginning of November 2014 until the end of January 2015, in the Carsethorn area at field JP48, less than 15 canes with very short lengths of tape on them were deployed on what appeared to be a poorly reseeded and part flooded field. It is not clear if these were being used to deter geese as no goose flocks of any note were seen on this field until 890 Pink-footed Geese were recorded there on 30 March 2015. Also in the Carsethorn area fields JP44 and JP43 had one orange and one black scarecrow, respectively, erected on them from the beginning of January and the beginning of February right through until mid-April. The only sighting of geese using these fields was a mixed flock of 290 Pink-footed Geese and 120 Barnacle Geese on field JP44 on 19 December so it is possible that the orange scarecrow on field JP44 was erected in response to the presence of these geese and was effective in keeping them away;

- In the Newmains area nearer Kirkbean, field N30 had what looked like a gas gun on it from mid-December until the end of February, though it was never heard in operation. This field had a winter cereal crop which is unlikely to be used by the geese and so it is not clear if this was deployed to disturb geese. From the end of March until mid-April a gas gun was seen on pasture N13 though again it was not heard in operation. No Barnacle Geese were observed using this field though flocks of Pink-footed Geese were recorded in fields nearby;
- From the beginning of February until mid-March, 15 or fewer canes with bags on were noted in the Ladyhall area on field PR07 and no geese were recorded on that field. At the end of March on field PR12, some blue canes had been erected with white tapes strung between them – it was not clear if this was done to deter geese or was part of some other sort of livestock management but no geese were recorded on this field;
- Six blue barrels were noted on pasture C28 at Newmains, Caerlaverock from end of March 2014;
- A gas gun could be heard at Thwaite field SC35 from mid-April 2015. It was positioned in a hedge and difficult to see and so might have been deployed earlier but gone unnoticed.

3.8 Count section dates and times of coverage

Table 8. Survey dates and times for the Management Scheme route count sections.

	Tuesday	Thursday	Sunday	Wednesday	Tuesday	Friday	Thursday	Sunday	Wednesday	Monday	Friday	Monday	Saturday
	07/10/14	23/10/14	02/11/14	19/11/14	02/12/14	19/12/14	08/01/15	18/01/15	04/02/15	23/02/15	13/03/15	30/03/15	18/04/15
Thwaite	11:30	10:30	10:00	13:00	15:00	16:00	15:15	14:00	08:15	10:15	11:45	14:15	08:00
Nith	12:15	08:30	09:00	14:30	09:00	15:00	13:00	12:45	11:30	08:45	10:00	12:30	06:30
Southernness	14:30	11:00	14:15	11:30	10:00	09:30	10:45	09:45	15:00	10:30	09:00	10:45	10:15
Colvend	15:30	12:00	15:00	10:00	11:00	11:30	09:15	10:45	16:30	09:30	07:45	11:15	12:30

There was an even spread of two counts on each day of the week except Saturday when there was one, giving 13 counts in total (Table 8).

3.9 Farmer liaisons regarding geese

As counts were conducted within the Scheme area, any significant conversations about goose numbers with the farmers were noted. Sometimes these were on days on which a count was not being conducted. Farmers were also contacted by phone in May to discuss goose issues once they had received the field count data from SNH. All conversations were about goose numbers and whether or not the counts being conducted gave a good representation of what the farmer's impression of field use was like; generally the farmers felt that the counts probably gave a reasonable representation of what was happening on their land although many also felt that the reduced frequency of counts did not give a good representation of goose use. Farmers engaging in conversations about geese were noted (Table 9).

Table 9. Records of conversations with farmers regarding goose activity in the Scheme area.

02/12/14	Spoke to farm worker at Boreland of Colvend and he said there had been some geese at what was probably field R12 a few days ago. Walked through centre of fields R07, R10/11 and R23 and there was good grass and no goose droppings.
19/12/14	Walked fields R07 & R08 at Boreland of Colvend but no droppings, R10/11 had some fresh droppings but grass still lush and c.100 sheep present. Stephen Roan said there had been c.1,000 geese there a few days before.
08/01/15	Field R08 at Colvend had some fresh goose droppings in it, plus sheep.
18/01/15	Jim Kirkland said nothing unusual to report and that the geese never use kale. No fresh droppings at Colvend on fields R07, R10/11 or R23.
04/02/15	Stephen Roan said not many about except for last few days on R25 and R09; LRG walked through some fields and there were semi-fresh droppings in R08 and R09 but not R24. Alastair Wylie felt things fairly usual except perhaps bit more use of 2nd year reseed by road and recent (since snow) use of C33 reseed which he had pushed birds off and which in the two days prior to the count I had seen up to 2,000 Barnacle Geese on.
23/02/15	Farm hand at Colvend said there had not been any geese about lately.
30/03/15	No geese seen on fields at Colvend although 450 overhead in skeins from Auchencairn area. No droppings in fields R07, R10/11 & R23.
11/05/15	Alastair Martin felt goose use fairly typical but not much use north of the road nor at Upper Locharwoods. Thought that perhaps some people should be reseeding more than they are and the grass leys getting a bit old and not being as attractive to the geese. Felt there had been use of some of his fields with zero counts but of course understood that this mismatch relates to the frequency of the counts. Thought April was quieter in terms of goose numbers about and wondered if that related to scaring activity. Jack Graham was disappointed that there had only been zero counts on field S67 as he felt that had been subject to high goose use especially early in the mornings. He understood that count frequency affected what was recorded but still said it was disappointing to only have a zero count total on that field. He wondered if use of the path running past the end of that field might be affecting the geese through disturbance. He was getting some panicking of his horses by early morning use of rockets at Newfield in April. He noted the high goose usage of his section of merse and felt there should perhaps be a higher monetary payment for keeping the geese on that habitat. He plans to keep rushes topped in field C21/22 as he felt there had been better use of that field by the geese much as the counts had suggested. He said he had

received the field count summaries from SNH last week.

James Worthington said counts had arrived from SNH 7-10 days ago. He understood why many of the fields he had seen geese in had not had any recorded. He said he had date and field referenced photos showing the geese on some of the fields in front of Lantonside house and also on some of the fields behind Glenhowan - he had forwarded these to Graeme and I asked if he could send these through to me too so that I could make a note of the fields used. A photo was supplied showing over 2,000 Barnacle Geese on the thin snow covered field W03/04 at 10:00 on 3rd Feb 2015 (the photo did not show the whole flock). On 4th Feb 3,050 were recorded on the official route count. On 23rd November 2014 at 10:15, a mixed goose flock of >1,000 birds was photographed at S17/18a. None were recorded on that field this winter during the official counts. Goose flocks of an unknown species containing thousands of birds each can be seen in photographs supplied from S08/12 for 18th January 2015 at 10:37 and H05/06/31/32 for 22nd February 2015 at 12:03. No geese were recorded on these two fields during any of the official winter route counts. An official count was conducted on 18th January but the Caerlaverock parish area was covered in the afternoon and the birds were not present by then.

Doug Freeman felt the counts were what they were and he had nothing extra to add.

Andrew Marshall agreed that there had not been many geese on the Powhillon fields this winter and possibly less use of the merse in early April too. He felt that use of the Powhillon fields had been reduced over time due to regular morning disturbance by wildfowlers accessing his land across various fields since the change in the Access Laws. He also agreed it could be down to sheep presence during the winter and the grass amounts available to the geese.

John Jamieson had nothing out of the ordinary to report. Agreed that geese had used fields between the farm and river but that these would be under cereal this year so that might change what happens next winter. Agreed that big fields north of the road had mainly seen Pink-footed Goose use with a few Barnacle Geese mixed in.

Stephen Brown thought the goose counts on the fields were a fair depiction of use over the winter at Newfield and Hollands within the usual constraints of count frequency. He said SNH had sent him some counts for some of his fields and for a neighbouring farm too. He thought that April seemed quiet and that the geese had left the area earlier than usual.

3.10 Coordinated Svalbard Barnacle Goose population count totals

Table 10. Coordinated Svalbard Barnacle Goose population count totals for the Solway 2014-2015.

Count section	01- Oct	08- Oct	23- Oct	29- Oct	19- Nov	18- Dec	23- Feb	25- Mar	22- Apr	29- Apr	06- May	13- May	20- May	27- May
Annan to Greta	0	810	950	400	n.c.	n.c.	90	0	0	1	450	0	0	0
Ruthwell to Cummertrees	0	0	0	0	200	256	6702	800	750	0	0	0	0	0
Longbridgemuir	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caerlaverock	2560	11910	7538	11540	3710	11275	14707	12410	8020	0	0	0	0	0
Kirkconnell & Ward Law	5050	0	4500	600	300	2444	155	930	0	0	0	0	0	0
Mersehead to Airds Pt	9510	5493	6535	6172	9541	8115	9665	9315	8083	1874	0	0	0	0
Caulkerbush to Rascarrel	0	0	0	7	2700	1000	0	0	0	0	0	0	0	0
Dundrennan to Wigtown	0	0	0	0	0	76	1120	1050	0	0	0	0	0	0
Rockcliffe Marsh	1360	7240	6540	9010	10050	0	2870	7500	19850	32850	9850	8300	2000	30
Burgh Marsh	0	0	1350	0	500	11000	0	0	0	0	0	0	0	0
Bowness to Grunc	58	1980	2591	3735	4890	4660	2940	3050	155	100	0	0	0	0
Total	18538	27433	30004	31464	31891	38826	38249	35055	36858	34825	10300	8300	2000	30

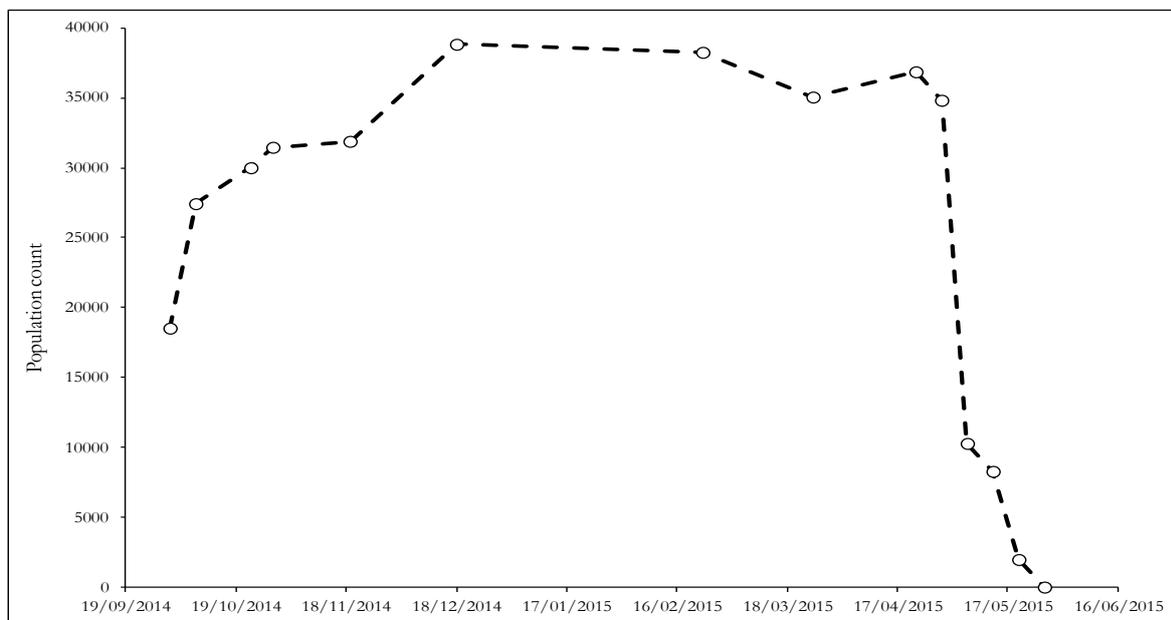


Figure 13. Total population of Svalbard Barnacle Geese on the Inner Solway from October 2014 to May 2015.

Total population counts of Svalbard Barnacle Geese built up rapidly on the Solway with nearly 20,000 present at the start of October (Table 10; Figure 13). The first arrivals of Barnacle Geese thought to be genuine migrants were recorded at the WWT Eastpark Farm reserve on 21 September and there were nearly 8,000 present by 25 September. The numbers recorded then built fairly steadily up to the end of October when over 30,000 birds

were present on the Solway and continued to rise to 38,886 by 18 December, the peak count for the winter. A fairly consistent 35,000 to 38,000 was recorded from mid-December to the end of April across five censuses – very similar to the previous winter. This consistency in the counts was perhaps due to the constancy of the weather during the winter in that very few episodes of freezing conditions were recorded and so it was felt the geese did not spread out across the Solway as much as usual due to food resources being largely maintained. The first evidence of spring migration was seen by 29 April when a massive flock of nearly 33,000, almost the whole Solway population, gathered on Rockcliffe Marsh. By 6 May this had dropped to just 10,000 in the Rockcliffe area with zero geese recorded elsewhere on the Solway. By 20 May 2015, only 2,000 Barnacle Geese remained on Rockcliffe Marsh, the remainder being in Norway or Svalbard.

Due to count variation, with possible inaccuracies and the chance of double-counting, an adopted count total for the population is usually derived by averaging those counts within 10% of the maximum recorded during the winter. In 2014-2015 the counts of 38,826 on 13 December, 38,249 on 23 February, 35,055 on 25 March and 36,858 on 22 April, fulfilled this criterion and were thus averaged to produce **an adopted population total of 37,300 Barnacle Geese** (rounded up to the nearest 100; compared to 38,100 in 2013-2014).

3.11 Brood size and juvenile productivity of the Svalbard Barnacle Goose

The juvenile productivity of the Svalbard Barnacle Goose observed in flocks sampled on the Inner Solway from September 2014 to December 2014 in the Caerlaverock, Kirkconnell, Carsethorn and Southernness areas varied between 2.7% to 14.7% (**Table 11**; 2.0% to 30.8% in 2013-2014) with a mean of 5.0% young from 15 flocks with 13,104 geese sampled (7.0%; n = 14 flocks; 10,135 geese sampled in 2013-2014). Across the same area, the total number of broods sampled was 215, with a mean family size of 1.7 young, range 1-4 young (2.0 young; n = 80 broods; range 1-4 young in 2013-2014).

Table 11. Brood size and juvenile productivity for Svalbard Barnacle Geese on the Solway in winter 2014-2015 (GC = Gavin Chambers, RSPB).

Date	Flock Size	Sample Size	Total Juvs	Field	Crop	Brood of 1	Brood of 2	Brood of 3	Brood of 4	Brood of 5	Brood of 6	Single Juvs	% juvs	Obs
25/09/2014	1670	1670	47	O7	pasture	11	7	6	1				2.8	LRG
25/09/2014	68	68	10	O2	pasture								14.7	LRG
25/09/2014	7500	1290	47	O11	pasture								3.6	LRG
29/09/2014	615	615	50	O8	pasture	11	8	5	2				8.1	LRG
07/10/2014	980	903	56	S1	pasture								6.2	LRG
10/10/2014	1300	1250	64	A8	pasture	20	17	2	1				5.1	LRG
10/10/2014	1490	1290	35	OM1	merse	15	7	2					2.7	LRG
10/10/2014	3600	2050	70	O3	pasture	20	15	4	1				3.4	LRG
24/10/2014	3300	595	21	O9	pasture	9	6	5					3.5	LRG
03/11/2014	3260	630	88	KM04	merse	9	2	4					14.0	LRG
02/12/2014	2500	1032	62	X66	pasture	15	6	4					6.0	LRG
10/12/2014	410	385	39	E12	pasture								10.1	LRG
15/11/2014	1100	83	8	V9	pasture								9.6	GC
30/11/2014	1093	1093	50	R6	pasture								4.6	GC
07/12/2014	150	150	8	R10	pasture								5.3	GC
Total		13104	655											
Overall juv%			5.00			Brood size totals:								
						110	68	32	5	0	0	Total broods	215	
						Number of juveniles per brood size category:								
						110	136	96	20	0	0	Max %juvs	14.7	
												Total juvs	362	
												Mean brood	1.68	

3.12 Leucistic Barnacle Geese

A minimum of two different leucistic Barnacle Geese was recorded in winter 2014-2015. As with previous recent winters, the leucistic birds were mainly seen on the Cumbrian marshes at Burgh or Rockcliffe with one tending to visit Redkirk Marsh near Gretna when not on Rockcliffe. During high tides they could be seen at Hurkledale, Caerlaverock and Mersehead too.

3.13 Other geese

One Light-bellied Brent Goose was seen in a large flock of Barnacle Geese (containing a leucistic bird) in the Hurkledale area on 23 February 2015.

3.14 Acknowledgements

Thanks go to Mike Carrier and Bob Jones for conducting census counts in the Rockcliffe/Burgh Marsh area, Dave Blackledge for counts covering the Bowness to Grune route, Marian & Dave Rochester for covering the Borgue to Wigtown route, Paul Tarling for covering Crook of Baldoon, David Charnock for covering Rascarrel to Sandyhills and Rowena Flavelle and Gavin Chambers for covering the Southwick area to Drumburn (GC also did three age assessments). Counts in the Caerlaverock area were also made by Joe Bilous.