



**Svalbard Barnacle Goose distribution around the
Solway Firth 2012-2013: Flock counts from the
Solway goose Management Scheme area**

WWT Conservation Programmes Report

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Executive Summary

A total of 13 route counts were carried out in winter 2012-2013 within the Solway Barnacle Goose Management Scheme area. The number of route counts was further reduced compared to previous years due to the further funding constraints required of the Solway Goose Scheme budget. 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 when a section was surveyed. Instances of direct disturbance aimed at geese and of conversations with farmers were also noted. Data are also presented on the coordinated Solway population 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 31,000 geese (the mean of six counts that were within 10% of the maximum of 32,044 recorded, rounded up to the nearest 100), a decrease of 2,900 birds on last winter's adopted estimate of 33,900 geese. Brood sizes were much smaller this winter at 1.6 goslings per family – there have only been two years with a lower average brood size since 1958 - with only a few large broods recorded (range 1-5 goslings; 172 families sampled), with an average juvenile productivity of 5.5% (range 0.8-15.0% young; 21 flocks and 12,372 birds sampled) compared to 2.1 goslings and 12.8% young respectively for last winter. Up to four different leucistic Barnacle Geese were recorded in winter 2012-2013 including a family group of three that are probably the same birds that have used that area for the last three winters. The leucistic birds were mainly seen in the Bowness to Grune area or at Rockcliffe, Cumbria and the single bird was often seen in the Southernness to Colvend area, with two Ross's Geese seen briefly together on Rockcliffe Marsh.

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 100% of the 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 just over 30,000 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 in March and 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.

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

Unlike previous surveys of the Scheme area, due to funding cuts, 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, 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 flighting 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 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.

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 Priestside 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 Priestside 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 again recorded in the Auchencairn/Rascarrel area in mid-winter and from the end of January onwards significant numbers of Barnacle Geese began using the Wigtown area with sporadic use of the Redkirk/Baurch/Gretna area too but this could not be economically covered via the 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 hour to two hour time period at the same time on the same day. There are usually weekly counts during the arrival period in October and during the departure period in April/May, with fortnightly counts in the months between. As in winter 2011-2012 however the fortnightly count in the November to March period was reduced to a single monthly count due to the funding constraints imposed on the Goose Scheme.

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

Tide tables are presented in the following figures for the months during which the geese were present in the Barnacle Goose Management Scheme area.

SEPTEMBER 2012 LAVER'S LIVERPOOL (Gladstone) TIDES
 All times shown are GMT – add one hour from 0100 25 March to 0100 28 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter																	
Date	HIGH WATER				LOW WATER				SUN MOON				Rise	Set	Rise	Set Ph.	
	Morning		Afternoon		Morning		Afternoon		Morning		Afternoon						
Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft
1 Sat	1127	9.3	30.4	2340	9.7	31.7	0606	0.9	3.1	1816	1.2	3.9	0522	1901	1849	0632	
2 Sun				1202	9.3	30.4	0642	1.0	3.2	1851	1.2	4.0	0524	1858	1938	0745	
3 Mon	0015	9.6	31.4	1233	9.2	30.1	0714	1.1	3.7	1923	1.4	4.7	0525	1856	1929	0856	
4 Tue	0048	9.4	30.7	1304	9.0	29.4	0742	1.4	4.7	1952	1.7	5.6	0527	1854	1951	1005	
5 Wed	0120	9.1	29.8	1336	8.7	28.6	0809	1.8	5.8	2021	2.1	6.9	0529	1851	2018	1112	
6 Thu	0154	8.7	28.5	1409	8.4	27.4	0834	2.2	7.2	2051	2.5	8.3	0531	1849	2049	1216	
7 Fri	0230	8.2	27.0	1447	7.9	26.0	0903	2.7	8.7	2127	3.0	9.9	0532	1846	2127	1315	●
8 Sat	0312	7.7	25.3	1534	7.5	24.5	0942	3.2	10.4	2216	3.5	11.3	0534	1844	2213	1408	1316
9 Sun	0409	7.2	23.6	1644	7.1	23.1	1036	3.6	11.9	2302	3.7	12.2	0536	1842	2306	1455	
10 Mon	0533	6.9	22.6	1817	7.0	23.1	1102	3.8	12.6	0537	1839	None	1534				
11 Tue	0703	7.0	23.1	1937	7.4	24.4	1109	3.6	11.8	1334	3.6	11.4	0539	1837	0010	1607	
12 Wed	0912	7.5	24.7	2035	8.0	26.2	1222	3.1	10.1	1441	3.1	10.0	0541	1834	0117	1635	
13 Thu	0901	8.1	26.7	2119	8.6	28.1	1319	2.5	8.1	1533	2.5	8.1	0543	1832	0230	1659	
14 Fri	0942	8.7	28.4	2157	9.1	29.8	1409	1.9	6.2	1620	1.9	6.3	0544	1829	0345	1721	
15 Sat	1019	9.1	30.0	2235	9.5	31.1	0454	1.4	4.6	1704	1.5	4.8	0546	1827	0500	1742	●
16 Sun	1056	9.5	31.2	2312	9.8	32.1	0536	1.0	3.4	1746	1.1	3.7	0548	1824	0623	1804	0211
17 Mon	1134	9.7	31.9	2351	9.9	32.8	0618	0.8	2.6	1827	0.9	3.1	0550	1822	0745	1828	
18 Tue				1213	9.8	32.1	0657	0.7	2.3	1907	0.9	3.0	0551	1820	0906	1856	
19 Wed	0031	9.9	32.5	1254	9.7	31.7	0735	0.8	2.8	1947	1.1	3.5	0553	1817	1030	1930	
20 Thu	0113	9.7	31.7	1337	9.4	30.7	0812	1.2	3.8	2027	1.4	4.6	0555	1815	1148	2012	
21 Fri	0158	9.3	30.4	1424	8.9	29.3	0852	1.7	5.5	2112	1.9	6.1	0557	1812	1258	2105	
22 Sat	0249	8.7	28.5	1520	8.4	27.7	0938	2.3	7.4	2206	2.4	7.8	0558	1810	1357	2208	1943
23 Sun	0354	8.1	26.4	1632	8.0	26.2	1040	2.8	9.3	2304	2.8	9.0	0600	1807	1443	2318	
24 Mon	0519	7.6	25.0	1757	7.8	25.7	1106	3.1	10.2	0602	1805	2318					
25 Tue	0650	7.6	25.1	1919	8.1	26.5	0056	2.7	9.0	1336	2.9	9.6	0604	1802	1549	0333	
26 Wed	0805	8.0	28.3	2027	8.5	28.7	0217	2.4	7.8	1448	2.5	8.1	0605	1800	1613	0449	
27 Thu	0904	8.5	27.8	2119	9.0	29.4	0324	1.9	6.2	1546	2.0	6.7	0607	1758	1634	0504	
28 Fri	0950	8.9	29.0	2203	9.3	30.4	0418	1.5	5.0	1633	1.7	5.5	0609	1755	1654	0417	
29 Sat	1028	9.1	29.8	2240	9.4	30.9	0501	1.3	4.4	1714	1.5	4.9	0611	1753	1713	0529	○
30 Sun	1102	9.2	30.2	2315	9.5	31.1	0538	1.3	4.2	1749	1.4	4.7	0612	1750	1733	0540	0319

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LAVER'S LIVERPOOL (Gladstone) TIDES **OCTOBER 2012**
 All times shown are GMT – add one hour from 0100 25 March to 0100 28 October

● New Moon ● First Quarter ○ Full Moon ● Last Quarter																	
Date	HIGH WATER				LOW WATER				SUN MOON				Rise	Set	Rise	Set Ph.	
	Morning		Afternoon		Morning		Afternoon		Morning		Afternoon						
Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft
1 Mon	1133	9.2	30.3	2348	9.4	30.9	0610	1.3	4.3	1821	1.4	4.7	0614	1748	1755	0750	
2 Tue				1203	9.2	30.2	0639	1.4	4.7	1852	1.6	5.2	0616	1746	1820	0857	
3 Wed	0019	9.3	30.4	1233	9.1	29.7	0708	1.6	5.3	1921	1.8	5.9	0618	1743	1850	1002	
4 Thu	0051	9.0	28.6	1304	8.8	28.0	0732	1.9	6.2	1950	2.1	6.9	0620	1741	1925	1104	
5 Fri	0124	8.7	28.5	1336	8.5	28.0	0759	2.2	7.3	2021	2.5	8.1	0621	1738	2008	1159	
6 Sat	0157	8.3	27.2	1411	8.1	26.8	0830	2.6	8.7	2057	2.9	9.4	0623	1736	2059	1248	
7 Sun	0237	7.8	25.7	1454	7.7	25.4	0908	3.1	10.2	2144	3.3	10.8	0625	1734	2157	1329	●
8 Mon	0327	7.4	24.1	1553	7.3	24.1	0957	3.6	11.6	2248	3.6	11.7	0627	1731	2300	1404	0734
9 Tue	0440	7.0	23.0	1718	7.2	23.5	1110	3.8	12.5				0629	1729		1433	
10 Wed	0611	7.1	23.2	1845	7.4	24.3	0018	3.5	11.6	1245	3.7	12.1	0630	1727	0009	1459	
11 Thu	0727	7.5	24.7	1949	8.0	26.1	0138	3.1	10.2	1400	3.2	10.4	0632	1724	0122	1522	
12 Fri	0821	8.1	26.7	2039	8.6	28.1	0240	2.5	8.2	1458	2.6	8.4	0634	1722	0237	1543	
13 Sat	0906	8.7	28.6	2123	9.1	29.9	0333	1.9	6.3	1549	2.0	6.5	0636	1720	0355	1605	
14 Sun	0948	9.3	30.3	2204	9.6	31.4	0422	1.4	4.6	1636	1.5	4.9	0638	1717	0517	1628	
15 Mon	1028	9.7	31.7	2246	9.5	32.4	0508	1.0	3.3	1721	1.1	3.7	0639	1715	0640	1655	1203
16 Tue	1109	9.9	32.5	2328	10.0	32.9	0551	0.8	2.5	1806	0.9	2.9	0641	1713	0805	1727	
17 Wed				1151	10.0	32.7	0633	0.7	2.3	1849	0.8	2.7	0643	1710	0928	1807	
18 Thu	0012	10.0	32.7	1235	9.8	32.3	0715	0.9	2.8	1933	1.0	3.2	0645	1708	1044	1857	
19 Fri	0058	9.7	31.8	1321	9.5	31.3	0756	1.2	4.0	2018	1.3	4.2	0647	1706	1148	1959	
20 Sat	0147	9.2	30.3	1411	9.1	29.9	0839	1.7	5.7	2107	1.8	5.7	0649	1704	1240	2108	
21 Sun	0242	8.7	28.4	1509	8.6	28.3	0928	2.3	7.6	2206	2.2	7.3	0651	1702	1321	2224	●
22 Mon	0348	8.1	26.5	1618	8.2	26.9	1033	2.9	8.4	2319	2.8	8.4	0653	1699	1352	2340	0334
23 Tue	0506	7.7	25.3	1736	8.0	26.3	1154	3.1	10.2				0654	1697		1418	
24 Wed	0628	7.7	25.2	1852	8.1	26.6	0039	2.6	8.5	1313	3.0	9.8	0656	1695	1440	0054	
25 Thu	0742	8.0	26.1	2000	8.4	27.6	0152	2.4	7.9	1421	2.6	8.7	0658	1693	1500	0207	
26 Fri	0839	8.3	27.3	2053	8.7	28.6	0256	2.1	6.9	1519	2.3	7.5	0700	1691	1519	0319	
27 Sat	0924	8.7	28.4	2137	9.0	29.4	0348	1.9	6.1	1606	2.0	6.6	0702	1649	1538	0429	
28 Sun	1002	8.9	29.2	2215	9.1	29.9	0430	1.7	5.7	1646	1.8	6.0	0704	1647	1559	0538	○
29 Mon	1036	9.1	29.7	2249	9.2	30.1	0506	1.7	5.5	1721	1.8	5.7	0706	1645	1623	0646	1951
30 Tue	1107	9.1	30.0	2322	9.2	30.1	0537	1.7	5.5	1754	1.7	5.7	0708	1643	1651	0751	
31 Wed	1138	9.2	30.0	2355	9.1	29.8	0606	1.7	5.7	1824	1.8	5.8	0710	1641	1725	0854	

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NOVEMBER 2012 LAVER'S LIVERPOOL (Gladstone) TIDES

● New Moon ● First Quarter ○ Full Moon ● Last Quarter																	
Date	HIGH WATER				LOW WATER				SUN MOON				Rise	Set	Rise	Set Ph.	
	Morning		Afternoon		Morning		Afternoon		Morning		Afternoon						
Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft
1 Thu				1209	9.1	29.8	0633	1.8	6.0	1855	1.9	6.2	0712	1639	1805	0952	
2 Fri	0027	8.9	29.3	1240	8.9	29.3	0703	2.0	6.5	1927	2.1	6.8	0713	1637	1853	1043	
3 Sat	0100	8.7	28.5	1312	8.7	28.6	0733	2.2	7.3	2000	2.3	7.7	0715	1635	1948	1128	
4 Sun	0135	8.4	27.5	1347	8.4	27.6	0806	2.6	8.4	2038	2.7	8.7	0717	1633	2040	1203	
5 Mon	0213	8.1	26.4	1427	8.1	26.5	0845	2.9	9.6	2122	3.0	9.7	0719	1631	2154	1234	
6 Tue	0259	7.7	25.2	1519	7.8	25.5	0931	3.3	10.8	2218	3.2	10.5	0721	1630	2303	1300	
7 Wed	0359	7.4	24.3	1627	7.6	24.8	1033	3.5	11.8	2330	3.3	10.7	0723	1628		1323	0037
8 Thu	0515	7.3	24.0	1745	7.8	25.0	1151	3.6	11.6				0725	1626	0015	1344	
9 Fri	0631	7.6	25.0	1856	8.0	26.1	0047	3.0	9.9	1310	3.2	10.6	0727	1624	0129		

JANUARY 2013 LAVER'S LIVERPOOL (Gladstone) TIDES

		● New Moon		● First Quarter		○ Full Moon		● Last Quarter								
		HIGH WATER				LOW WATER				SUN MOON						
		Morning		Afternoon		Morning		Afternoon		Rise	Set Ph.					
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft							
1 Tue	0102	8.8	26.9	1316	9.0	29.5	0739	1.9	6.1	2012	1.8	5.9	0828	1604	2101	0956
2 Wed	0137	8.7	28.5	1351	8.9	29.0	0615	2.0	6.6	2050	2.0	6.5	0827	1605	2213	1016
3 Thu	0216	8.5	26.0	1431	8.7	28.5	0654	2.2	7.3	2129	2.2	7.2	0827	1606	2327	1036
4 Fri	0259	8.3	27.3	1516	8.5	27.8	0636	2.5	8.2	2213	2.4	7.9	0827	1608	1057	1057
5 Sat	0350	8.1	26.5	1610	8.3	27.1	1026	2.7	9.0	2309	2.6	8.6	0826	1609	0043	1120
6 Sun	0452	7.9	26.0	1718	8.1	26.5	1130	2.9	9.5				0826	1610	0201	1147
7 Mon	0606	7.9	25.9	1838	8.1	26.5	0021	2.7	8.9	1249	2.9	9.4	0826	1612	0319	1221
8 Tue	0723	8.1	26.7	1954	8.3	27.3	0141	2.6	8.4	1411	2.6	8.4	0825	1613	0437	1304
9 Wed	0830	8.6	28.1	2101	8.7	28.6	0253	2.2	7.2	1522	2.1	6.8	0824	1614	0548	1359
10 Thu	0930	9.1	29.7	2200	9.1	29.9	0356	1.8	5.8	1626	1.6	5.7	0824	1616	0650	1508
11 Fri	1024	9.5	31.1	2253	9.4	29.9	0453	1.4	4.5	1724	1.1	3.5	0823	1617	0739	1626
12 Sat	1113	9.8	32.2	2342	9.6	31.5	0545	1.1	3.4	1817	0.7	2.3	0822	1619	0817	1748
13 Sun				1200	10.0	32.7	0634	0.9	2.9	1906	0.6	1.8	0821	1621	0848	1910
14 Mon	0028	9.6	31.4	1245	10.0	32.6	0719	0.9	2.9	1950	0.6	2.0	0820	1622	0913	2030
15 Tue	0112	9.4	30.9	1328	9.6	32.0	0802	1.1	3.6	2032	0.9	3.0	0820	1624	0935	2146
16 Wed	0153	9.1	29.8	1409	9.4	30.8	0842	1.5	4.8	2111	1.4	4.5	0819	1626	0956	2300
17 Thu	0233	8.7	28.5	1451	9.0	29.4	0921	1.9	6.4	2150	1.9	6.4	0818	1627	1016	2411
18 Fri	0315	8.2	27.0	1536	8.4	27.7	1001	2.5	8.1	2230	2.5	8.2	0816	1629	1038	2500
19 Sat	0403	7.8	25.5	1629	7.9	25.9	1048	3.0	9.8	2319	3.0	9.9	0815	1631	1102	0120
20 Sun	0503	7.4	24.2	1733	7.5	24.4	1151	3.4	11.1				0814	1633	1130	0226
21 Mon	0617	7.2	23.8	1851	7.3	23.9	0024	3.3	11.0	1307	3.5	11.5	0813	1634	1203	0328
22 Tue	0734	7.3	24.0	2004	7.4	24.3	0137	3.4	11.1	1420	3.3	10.9	0812	1636	1242	0426
23 Wed	0838	7.7	25.1	2103	7.8	25.4	0242	3.2	10.3	1520	2.9	9.6	0810	1638	1329	0518
24 Thu	0927	8.1	26.5	2149	8.1	26.7	0335	2.8	9.2	1610	2.5	8.2	0809	1640	1424	0516
25 Fri	1009	8.5	27.8	2227	8.5	27.7	0419	2.4	7.9	1653	2.1	7.0	0808	1642	1525	0640
26 Sat	1045	8.8	28.9	2303	8.7	28.6	0459	2.1	6.8	1732	1.8	5.9	0806	1644	1631	0712
27 Sun	1118	9.0	29.6	2338	8.9	29.2	0536	1.8	5.9	1809	1.5	5.7	0805	1646	1740	0739
28 Mon	1151	9.2	30.2				0612	1.6	5.1	1845	1.4	4.5	0803	1648	1851	0803
29 Tue	0009	9.0	29.7	1224	9.3	30.4	0648	1.4	4.6	1921	1.3	4.2	0802	1649	2003	0824
30 Wed	0042	9.1	29.9	1257	9.3	30.5	0725	1.4	4.6	1956	1.3	4.3	0800	1651	2116	0844
31 Thu	0117	9.1	29.7	1332	9.2	30.3	0800	1.5	4.9	2030	1.5	4.9	0758	1653	2231	0905

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LAVER'S LIVERPOOL (Gladstone) TIDES FEBRUARY 2013

		● New Moon		● First Quarter		○ Full Moon		● Last Quarter								
		HIGH WATER				LOW WATER				SUN MOON						
		Morning		Afternoon		Morning		Afternoon		Rise	Set Ph.					
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft							
1 Fri	0154	8.9	29.3	1409	9.1	29.7	0836	1.7	5.6	2106	1.8	5.7	0757	1655	2348	0927
2 Sat	0234	8.7	28.5	1451	8.8	28.8	0913	2.0	6.6	2144	2.1	6.9	0755	1657		0952
3 Sun	0321	8.4	27.5	1542	8.4	27.6	0958	2.4	7.7	2234	2.5	8.1	0753	1659	0105	1023
4 Mon	0419	8.0	26.3	1648	8.0	26.2	1057	2.7	8.8	2344	2.8	9.2	0751	1701	0220	1101
5 Tue	0536	7.8	25.5	1815	7.8	25.5				1218	2.9	9.4	0750	1703	0332	1148
6 Wed	0701	7.9	25.8	1942	8.0	26.1	0114	2.8	9.2	1351	2.7	8.6	0748	1705	0435	1249
7 Thu	0817	8.3	27.1	2055	8.4	27.6	0236	2.5	8.1	1511	2.2	7.1	0746	1707	0529	1400
8 Fri	0921	8.8	28.9	2154	8.9	29.1	0344	2.0	6.4	1618	1.6	5.1	0744	1709	0611	1518
9 Sat	1014	9.3	30.6	2244	9.3	30.4	0443	1.5	4.8	1716	1.0	3.3	0742	1711	0645	1640
10 Sun	1102	9.7	31.9	2329	9.5	31.1	0534	1.0	3.4	1805	0.6	2.1	0740	1713	0713	1801
11 Mon	1145	9.9	32.5				0620	0.8	2.6	1849	0.5	1.5	0738	1715	0737	1919
12 Tue	0010	9.5	31.3	1226	9.9	32.5	0701	0.7	2.4	1928	0.6	1.8	0736	1717	0759	2036
13 Wed	0048	9.4	30.9	1304	9.7	32.0	0739	0.9	2.9	2004	0.8	2.6	0734	1719	0820	2101
14 Thu	0124	9.2	30.1	1340	9.4	30.9	0814	1.2	4.0	2037	1.3	4.3	0732	1721	0842	2301
15 Fri	0159	8.8	29.0	1417	9.0	29.5	0847	1.7	5.5	2107	1.9	6.1	0730	1723	0905	
16 Sat	0234	8.4	27.6	1455	8.5	27.7	0919	2.2	7.3	2137	2.4	7.9	0728	1725	0932	0009
17 Sun	0315	7.9	26.1	1540	7.9	25.8	0954	2.8	9.1	2214	3.0	9.7	0726	1727	1003	0114
18 Mon	0405	7.4	24.4	1639	7.3	23.9	1044	3.3	10.8	2308	3.5	11.4	0724	1729	1040	0215
19 Tue	0515	7.0	23.1	1758	6.9	22.7				1202	3.6	11.9	0722	1731	1124	0309
20 Wed	0642	7.0	22.8	1925	7.0	23.0	0034	3.7	12.1	1333	3.5	11.6	0720	1733	1215	0356
21 Thu	0802	7.3	23.9	2034	7.4	24.3	0200	3.5	11.5	1446	3.1	10.2	0717	1735	1313	0437
22 Fri	0859	7.8	25.5	2124	7.9	25.9	0304	3.0	10.0	1542	2.6	8.5	0715	1737	1417	0511
23 Sat	0942	8.3	27.1	2203	8.3	27.4	0354	2.5	8.3	1628	2.1	6.8	0713	1739	1524	0640
24 Sun	1020	8.7	28.5	2238	8.7	28.6	0436	2.1	6.7	1709	1.7	5.4	0711	1740	1635	0606
25 Mon	1054	9.0	29.6	2311	9.0	29.6	0516	1.6	5.4	1744	1.3	4.3	0709	1742	1748	0628
26 Tue	1127	9.3	30.4				0554	1.3	4.3	1824	1.0	3.4	0706	1744	1902	0650
27 Wed				1200	9.5	31.0	0631	1.1	3.5	1900	0.9	3.0	0704	1746	2016	0711
28 Thu	0019	9.4	30.7	1236	9.5	31.3	0708	1.0	3.3	1936	0.9	3.1	0702	1748	2135	0733

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MARCH 2013 LAVER'S LIVERPOOL (Gladstone) TIDES

All times shown are GMT -- add one hour from 0100 31 March to 0100 27 October

		● New Moon		● First Quarter		○ Full Moon		● Last Quarter								
		HIGH WATER				LOW WATER				SUN MOON						
		Morning		Afternoon		Morning		Afternoon		Rise	Set Ph.					
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft							
1 Fri	0055	9.4	30.7	1312	9.5	31.1	0743	1.1	3.5	2010	1.1	3.7	0669	1750	2253	0758
2 Sat	0133	9.2	30.3	1350	9.3	30.4	0816	1.3	4.2	2045	1.5	4.8	0657	1752		0827
3 Sun	0213	9.0	29.4	1433	8.9	29.2	0856	1.6	5.3	2123	1.9	6.2	0655	1754	0036	0903
4 Mon	0300	8.6	28.1	1525	8.4	27.9	0941	2.1	6.8	2212	2.4	7.9	0653	1756	0122	0948
5 Tue	0359	8.1	26.5	1634	7.9	25.8	1041	2.5	8.2	2322	2.9	9.4	0650	1758	0227	1043
6 Wed	0518	7.7	25.3	1806	7.6	24.9				1205	2.8	9.1	0648	1800	0332	1148
7 Thu	0647	7.8	25.4	1955	7.8	25.5	0056	2.9	8.6	1341	2.6	8.5	0645	1801	0407	1302
8 Fri	0805	8.2	26.8	2047	8.3	27.1	0223	2.6	8.5	1501	2.1	6.9	0643	1803	0444	1419
9 Sat	0909	8.7	28.6	2142	8.8	28.7	0333	2.0	6.7	1607	1.5	5.0	0641	1805	0513	1538
10 Sun	1000	9.2	30.2	2229	9.1	30.0	0430	1.5	4.9	1701	1.0	3.4	0638	1807	0536	1656
11 Mon	1044	9.5	31.3	2309	9.3	30.6	0516	1.1	3.6	1746	0.7	2.4	0636	1809	0601	1812
12 Tue	1124	9.7	31.8	2347	9.4	30.9	0600	0.9	2.8	1825	0.6	2.1	0634	1811	0623	1927
13 Wed				1202	9.7	31.8	0638	0.8	2.6	1900	0.7	2.4	0631	1813	0644	2040
14 Thu	0021	9.4	30.7	1237	9.5	31.3	0712	0.9	3.0	1933	1.0	3.2	0629	1815	0708	2119
15 Fri	0054	9.2	30.1	1312												

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. 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).

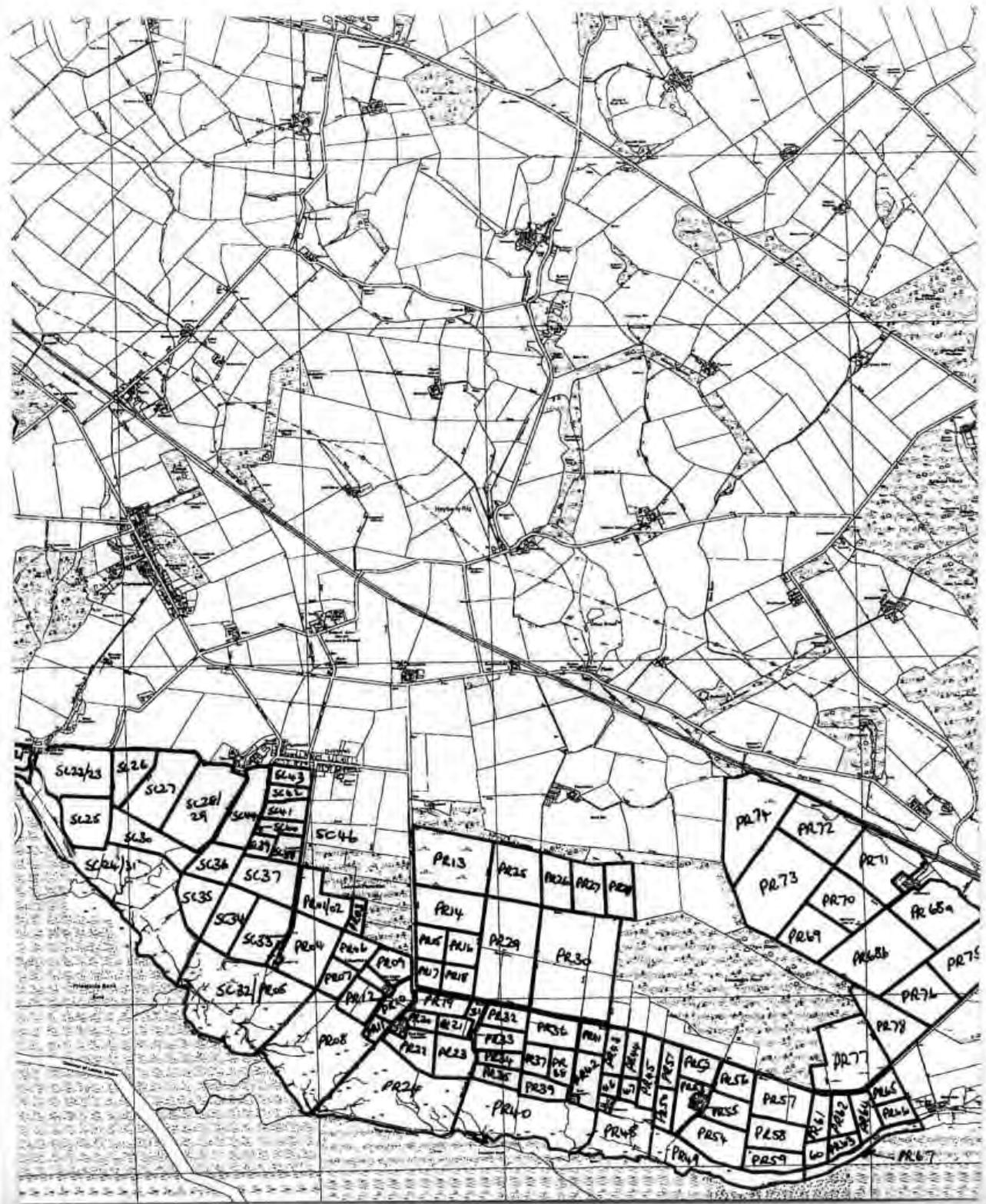


Figure 3. Field codes for the Priestside/Hurkledale/Thwaite area of the Goose Management Scheme.

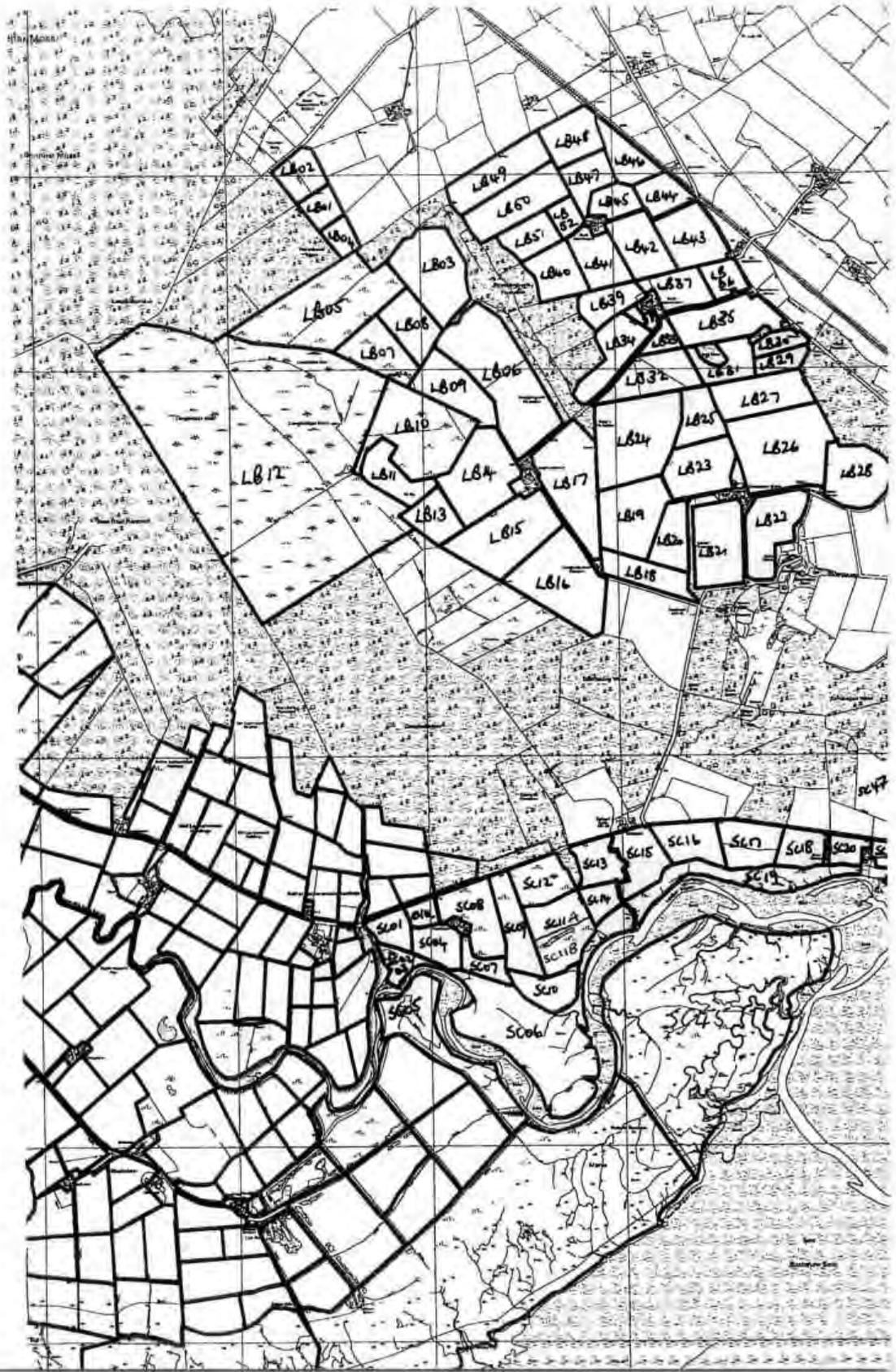


Figure 4. Field codes for the Powhillon/Stanhope/Longbridgemuir area of the Goose Management Scheme.

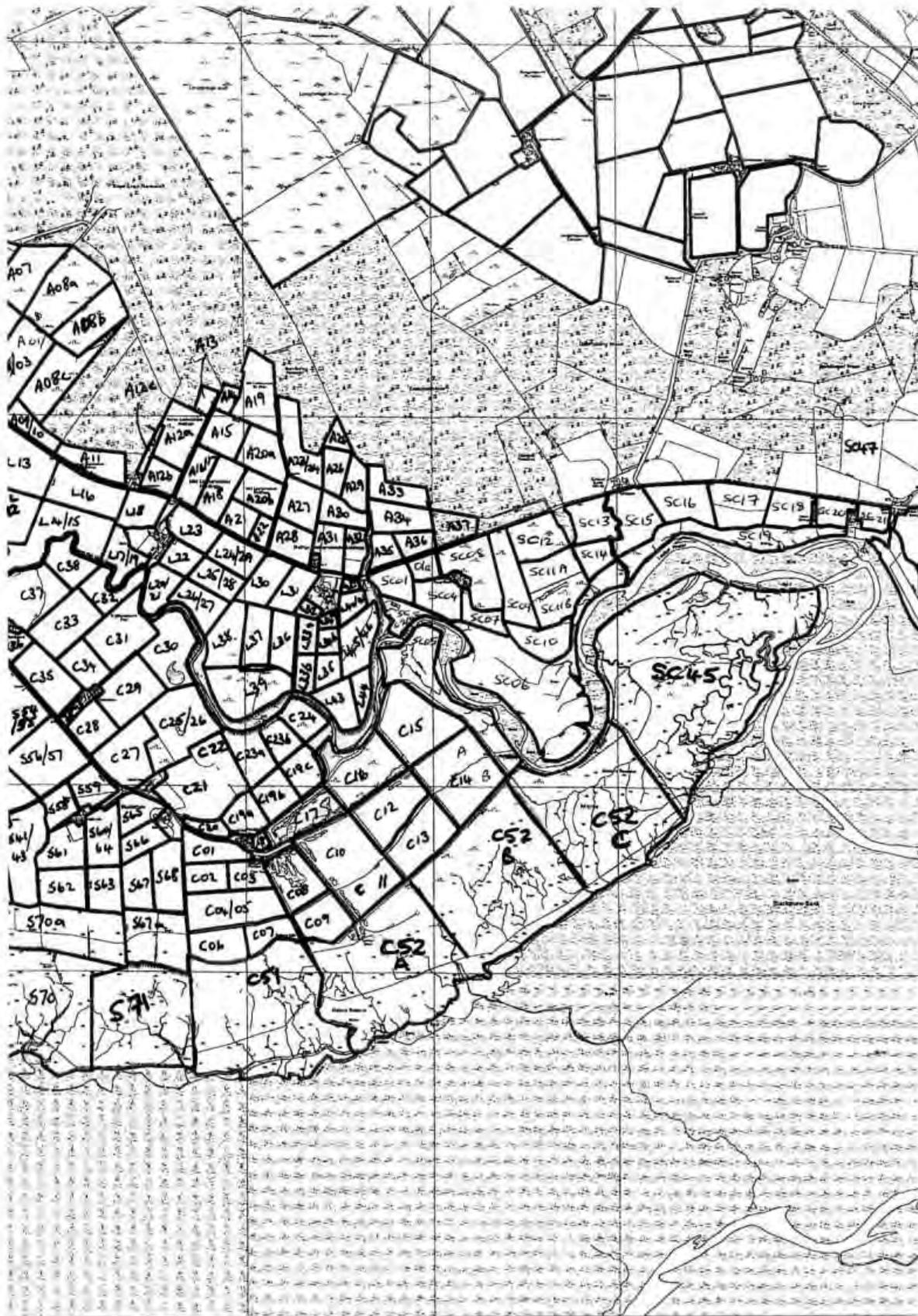


Figure 5. Field codes for the Caerlaverock/Nether Locharwoods area of the Goose Management Scheme.

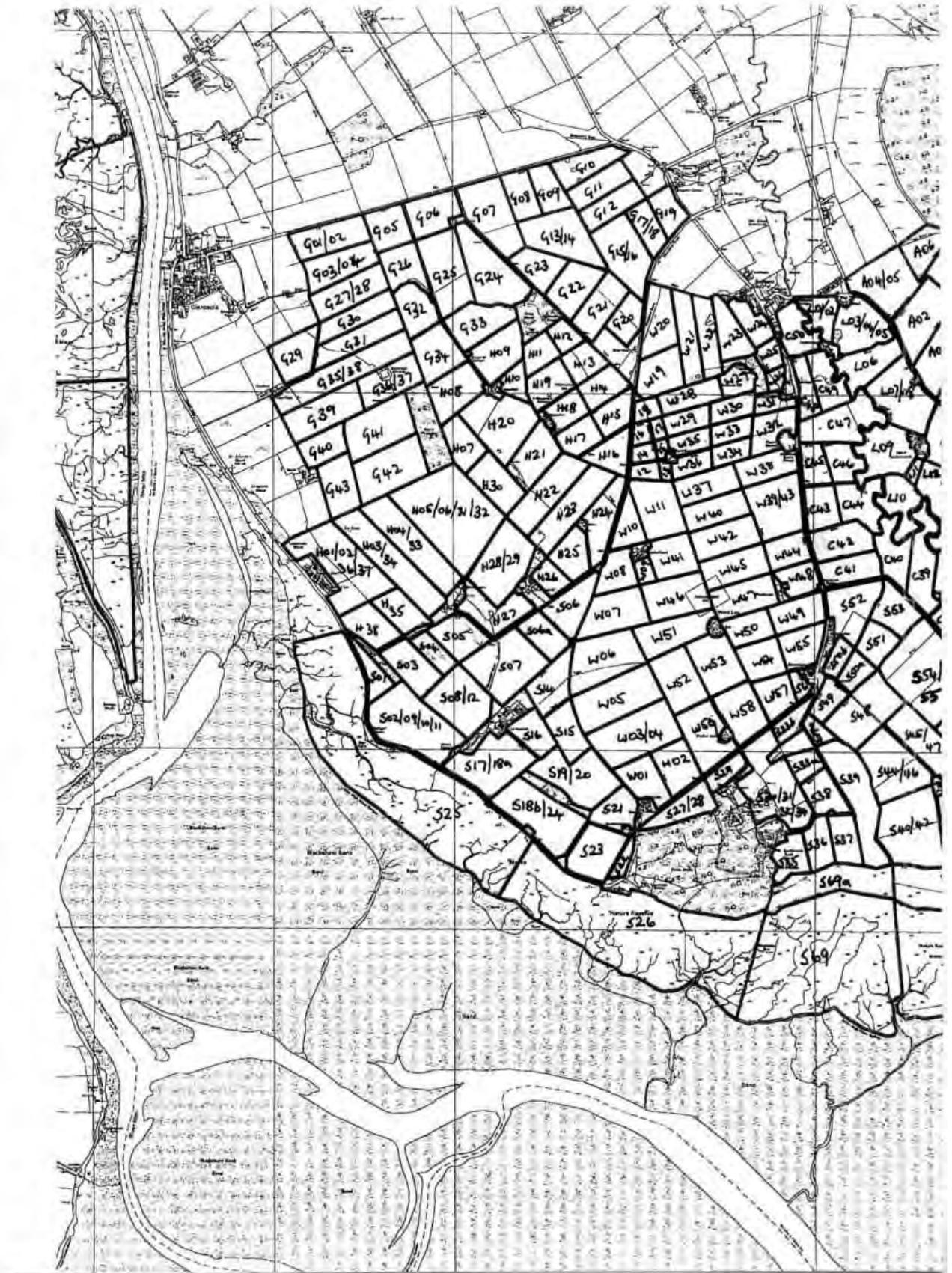


Figure 6. Field codes for the Lantonside/Ward Law area of the Goose Management Scheme.

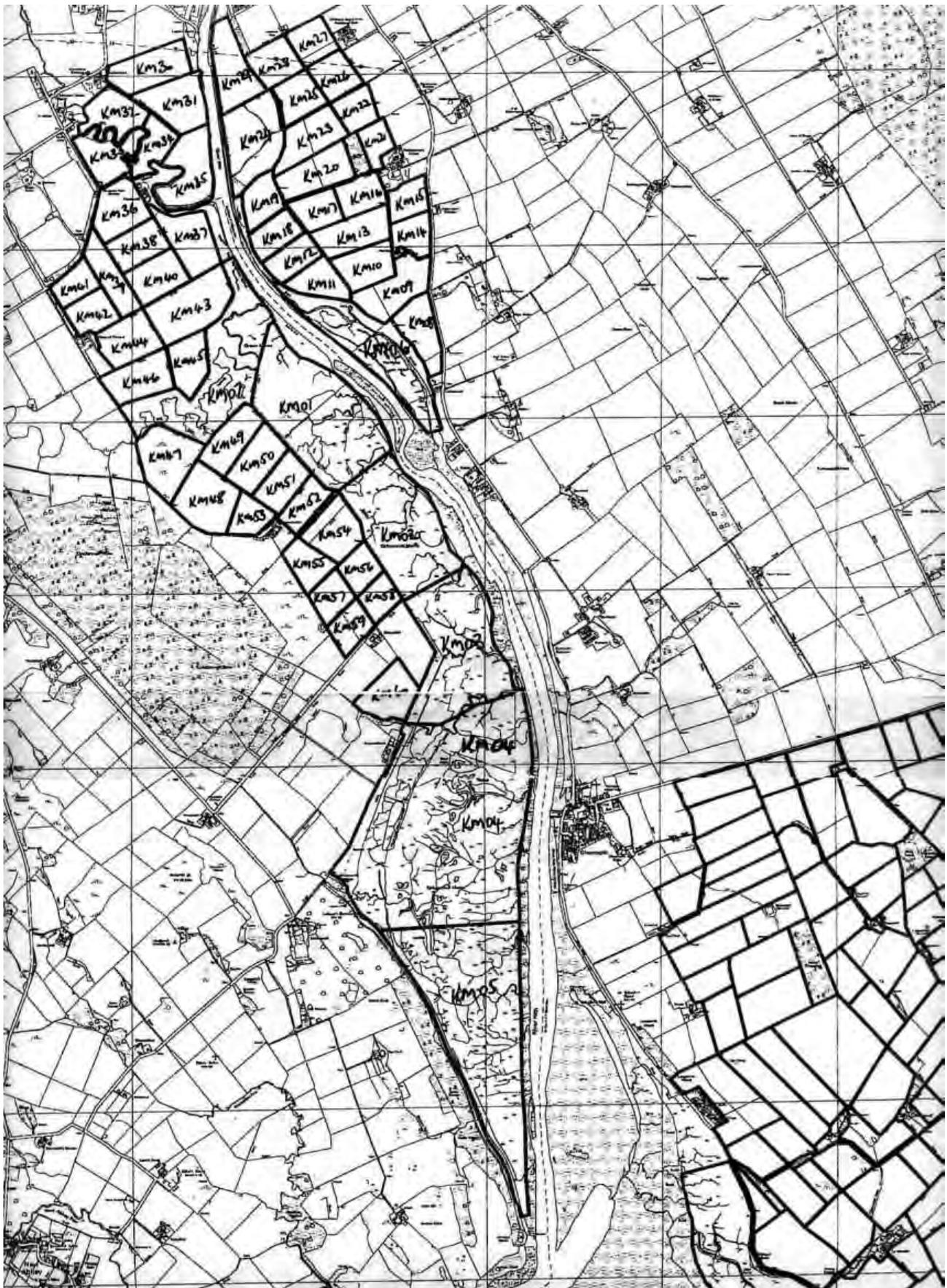


Figure 7. Field codes for the Kelton/Greenmerse/Kirkconnell area of the Goose Management Scheme.

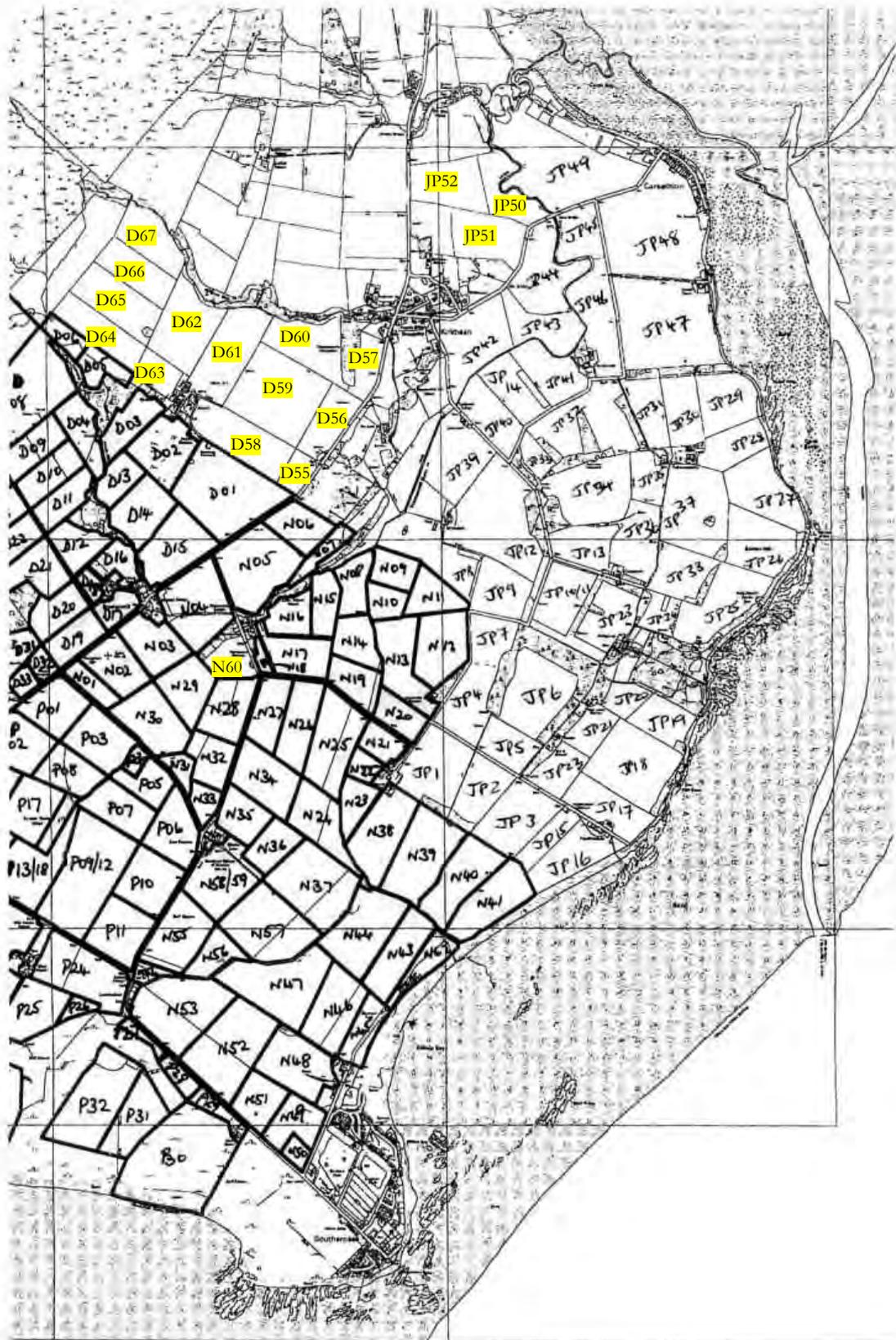


Figure 8. Field codes for the Carsethorn/Southernness area of the Goose Management Scheme (new field codes in areas used by the geese more regularly since 2008-2009 are shown highlighted).

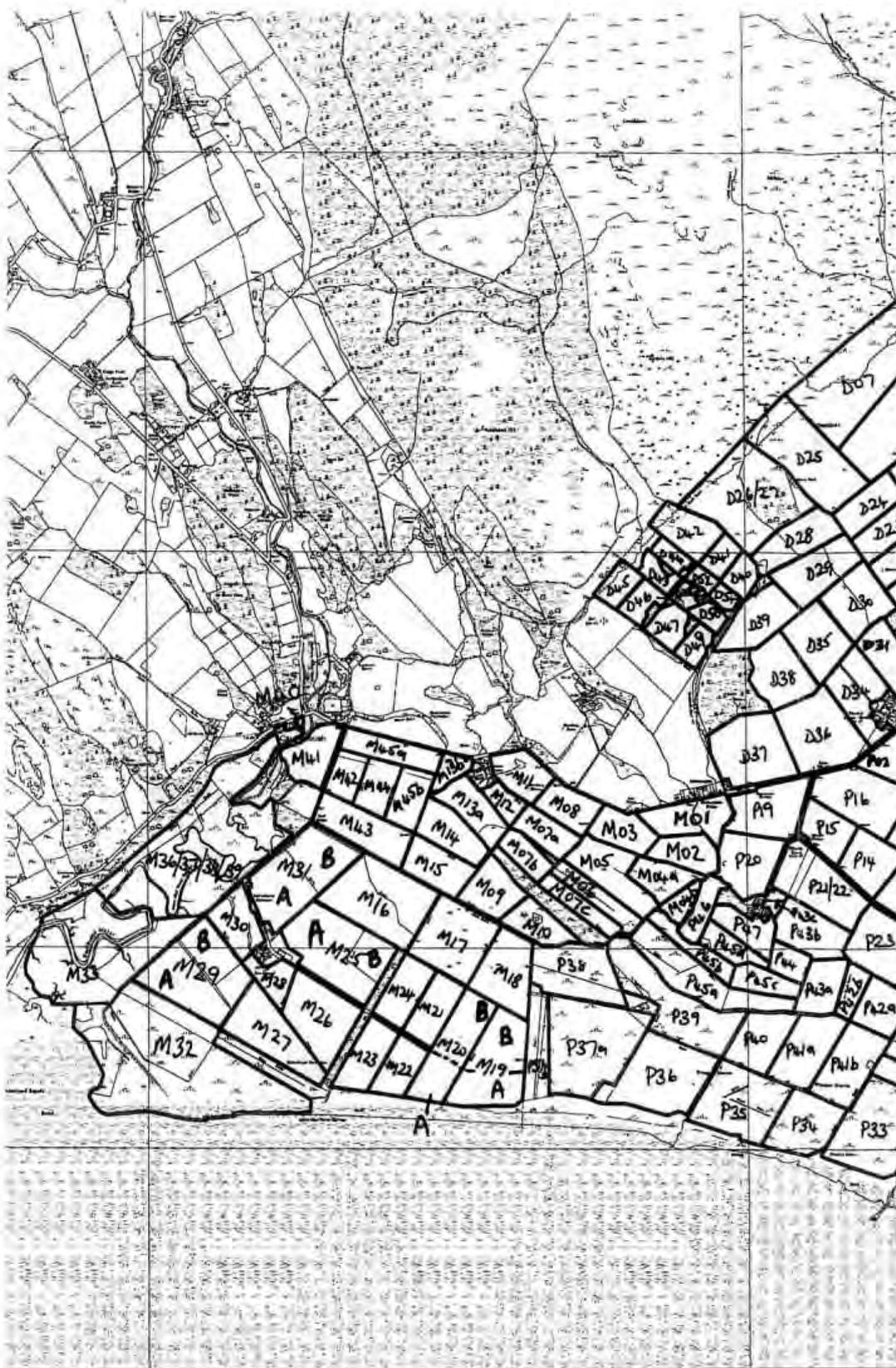


Figure 9. Field codes for the West Preston/Cowcourse/Mersehead area of the Goose Management Scheme.



Figure 10. 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

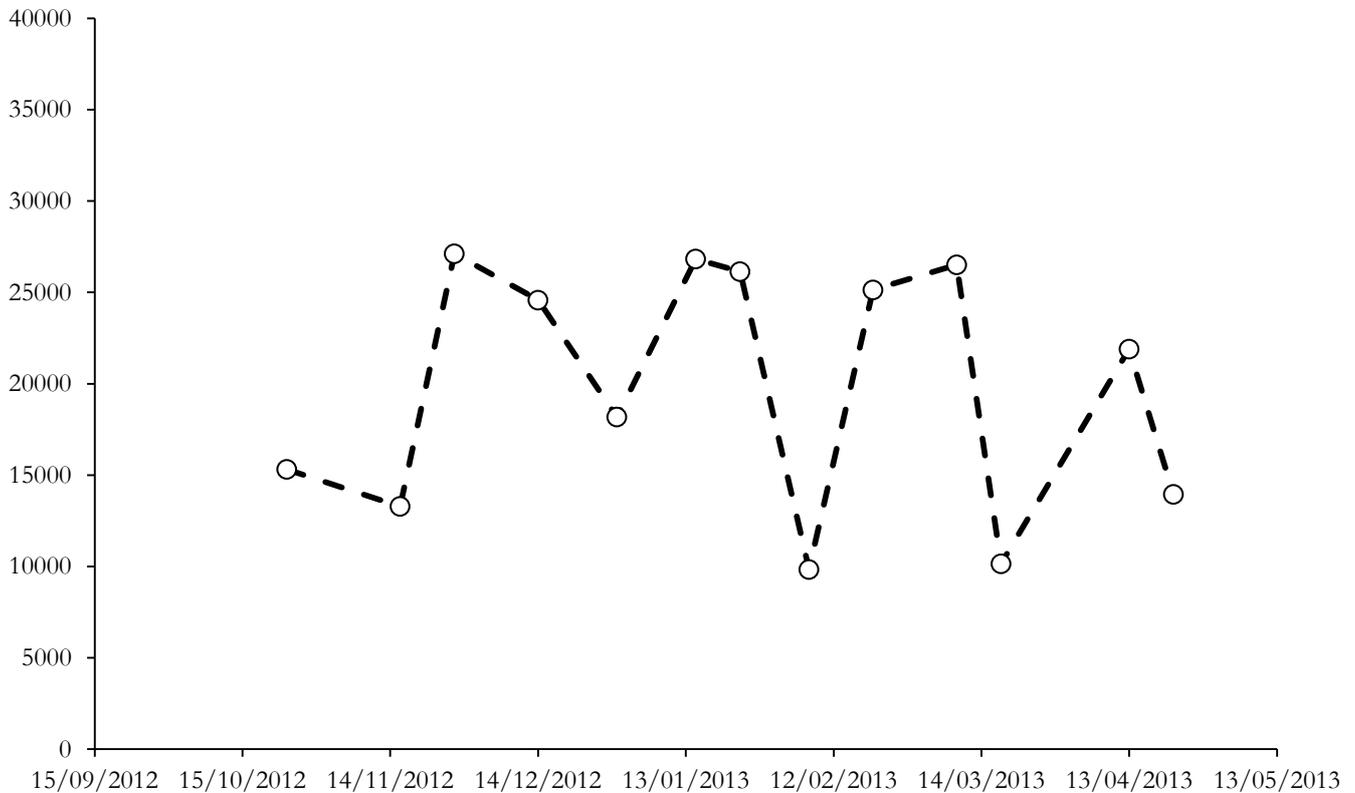


Figure 11. Svalbard Barnacle Goose route count totals within the Management Scheme area.

Some totals 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.

The mean number of geese recorded during the route counts was 19,918 for the period from the end of October (when the contract started) to the end of April (15,866 in 2011-2012) ranging from a minimum of 9,837 mid-winter on 7 February 2013 when food levels were at a minimum on the frozen fields of the Scheme area, up to a maximum of 27,115 (25,909 in 2011-2012). On the final route count on 22 April 2013, 13,950 geese were still present within the Scheme area. During other census counts and monitoring the last 39 were recorded in the Caerlaverock area on 6 May and the last 800 in the Mersehead area on 8 May 2013 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. In winter 2012-2013 conditions were tough throughout the winter, initially due to poor grass availability within the Scheme area due to flooding after a very wet summer and secondly due to a cold winter which lingered into May as temperatures struggled to get into double figures and grass growth remained poor.

Flock sizes and field distribution of the 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	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
A01/03				1620	82		3150							4852
A18			9	25	150									184
A21											70			70
C01						105	820		160					1085
C02				290	76									366
C03		45		5	12		820	410						1292
C04/05		30	1760	150	130	1860								3930
C06													320	320
C07		18	1860				1110						105	3093
C08	86				110			131						327
C09		340	1360	190	100						30	360	82	2462
C10/11	205	440	80	20			1420		250	590	60		160	3225
C12			2600	110								130		2840
C13			360			1230								1590
C14			430		130	260								820
C15				550									60	610
C16	2	20	42	170	180		5	92	350				290	1151
C17			12			6								18
C19a	300	40	70		140					1090				1640
C19b		480		360	70					1790				2700
C19c			2100			3800							170	6070
C20		60			17			220			130			427
C21/22		350	340		420				15		90			1215
C23a			1060		430	2020					50			3560
C23b				910		270								1180
C25/26					280									280
C27		180	140											320
C29				1830	125				350					2305
C30			76			4								80
C34									2660					2660
C35	50	7			38									95
C41								32	640					672
C42						360		700						1060
C51/S71		310		410	70	40	480	130	240	150	570	160	40	2600
C52	3600	430		1990		2280		770	130	3120	2830	630	515	16295
Drumburn Merse										1130			550	1680
D36							80							80
D39							850							850
D59						640								640
JP46						490								490
JP48			180			620		750					13	1563
JP52							2000			280				2280
KM01	25	200	45				1140							1410
KM02		410											22	432
KM03	2490	80							70				620	3260
KM04		2490		20				360				4950	1300	9120
KM05													2	2
KM06							48					550		598
KM09							810							810
KM10					1590									1590
KM11									1360					1360
KM12													260	260
KM17													68	68
KM19													40	40
KM24													80	80
KM30												380		380
KM31													196	196

KM34							460						460
KM39										480			480
KM43				1280									1280
KM50							720						720
KM51			410				280						690
KM60				1100									1100
L24/29					145								145
L25/28					120								120
L26/27			210										210
L30		15									480		495
L31		320											320
L36												240	240
L37				270	280	2150							2700
LB14									8				8
M03			1330										1330
M05						410					520		930
M06											220		220
M07a											170		170
M07b			470		560								1030
M13a					12	330							342
M16		14			55	260	120		47				496
M19			115							820	680		1615
M20	1250	19		450			55			15			1789
M21									37				37
M22	170	190								130			490
M23	4			2300						110			2414
M24				4					19				23
M25	8		85		105		2					3	203
M26	13			140		620				220	200	210	1403
M27					65						420		485
M28											210		210
M29		90	440		650		1310			840		1220	4550
M30			420									210	630
M31	2090	412	22	900	275	75	70	588			600		5032
M32		650			420	530	245			250			2095
M33							210			730			940
M36/37/38/39					86					130			216
M41				550							110		660
M42											90		90
M45a										250		155	405
N14										1680			1680
N28												32	32
N32							62						62
N34							310						310
N35							190						190
N43					410	1320							1730
N44					620								620
N49								520					520
N51			15										15
N52			1100	690			250						2040
N53			1100				210						1310
P09/12	3850		1660			700		1520					7730
P10				810		2100							2910
P11						900	80						980
P13/18			4			37				2			43
P14										12			12
P19								690		640			1330
P21/22											400		400
P23					340								340

P24		2330	710				2460						5500
P25	450		140	200	540	330	190	460	1860			750	4920
P26			1180										1180
P33			280				220			35		920	350 1805
P34		300	230								1270	480	2280
P35	210				360				160		2500		3230
P37a										110			110
P39			160									3	163
P40			200		1510			900				2800	5410
P41a											470		470
P41b		17	190	470		340		350			360		1727
P42a	340	9	360			340	130				880	25	2084
P42b		60									860		920
P43a			220						460			37	717
P44											110		110
P45a					160						40		200
P45c						310					340	780	1430
P45d						260				2	35	6	303
P47						350						7	357
PR23		160											160
PR30				1760									1760
PR32					300								300
PR33				180									180
PR36					1320						15		1335
PR68a									570				570
PR68b							3900		6				3906
PR69									1000				1000
PR73				3800					2600				6400
PR75							2						2
PR76							90						90
R03									2000			5	2005
R04									60				60
R05						1					200		201
R07											940		940
R08							1500						1500
R10											240		240
R12												420	420
R13								355				890	1245
R21											120		120
S02/09/10/11				3					2900	4300			7203
S06									710				710
S06a									2900	15			2915
S07									190				190
S08/12									1100	1600			2700
S17/18a											6		6
S26		190									110		300
S39											1020		1020
S40/42			2620		1240						690		4550
S41/43					160								160
S44/46					16								16
S51					130								130
S52									120				120
S53					1670				1320	1430			4420
S54/55										10			10
S56/57					210								210
S60/64		1250											1250
S61		10											10
S63					430					1690			2120
S65					115								115
S66	175			55	70				25				325

S67					305			39					344	
S68			390	80	34								504	
S69										1340		9	1349	
SC04							340						340	
SC06		26			60					760			846	
SC08				870									870	
SC17								820					820	
SC18						1480							1480	
SC22/23				5							34	2510	2549	
SC24/31			530							60			590	
SC27					1260							95	1355	
SC44				11		2							13	
SC45		1300						820		2100		1930	6150	
W54											290		290	
Total	15318	13292	27115	24578	18183	26830	26139	9837	25137	26511	10151	21899	13950	258940

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.

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

Field code	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
A01/03				10										10
A04/05							95							95
C10/11										1				1
C19b										2				2
C41						180		60	110					350
C42						50								50
C49				45										45
Drumburn Merse										130				130
D59						240						300		540
JP46						210				95				305
JP49			5											5
JP51										310				310
JP52							300							300
KM04												40		40
KM05													4	4
KM17													20	20
KM30												110		110
KM31													20	20
KM34						30	300							330
KM39										250				250
L06				12										12
LB14									110					110
N10										310				310
N40			18											18
P19						1								1
P40								2						2
PR15											50			50
PR30				2										2
PR56							19	1						20
PR68a									6					6
PR68b									110					110
PR73									200					200
PR74									550					550
PR75							5							5
S06a										35				35
S17/18a											30			30
S18b/24										14				14
S53										20				20
SC22/23													2	2
SC45												40		40
W54												40		40
W57												6		6
Total	0	0	23	69	0	711	719	63	1086	1167	80	536	46	4500

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. 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.

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

Field code	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
C16							25							25
C17			45	4	8	20								77
C30												4		4
Total	0	0	45	4	8	20	25	0	0	0	0	4	0	106

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. 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.

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

Field code	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
C08							40							40
C09												1		1
C16													3	3
C17	10		65	75	120	115								385
C42						1								1
M16			7											7
Total	10	0	72	75	120	116	40	0	0	0	0	1	3	437

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.

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

Field code	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
A01/03						7								7
A02		210	20											230
A18		9												9
A27					20									20
C08			25			160	120		2					307
C09												1		1
C17		28	50	90	170	100	50	189	170	163	142			1152
C30		80												80
C41				6										6
KM01	14													14
P41b						3								3
PR04			130		25									155
PR70									11					11
PR76					18									18
S36		8												8
SC44											69			69
Total	14	335	225	96	233	270	170	189	183	163	211	1	0	2090

3.6 Mute Swan counts for the Management Scheme area

Mute Swans mainly occur on the ponds at WWT Caerlaverock with scattered pairs elsewhere.

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

Field code	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13	Total
C08			3	13								8	2	26
C09												1		1
C16												3		3
C17	20	25	45	65	75	70	80	54	60	52	45		2	593
S33a												2	2	4
Total	20	25	48	78	75	70	80	54	60	52	45	14	6	627

3.7 Deliberate disturbance to geese in the Management Scheme area

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

- From mid-November 2012 through to the end of April 2013, a scarecrow could be seen near the farmhouse at the southern edge of a stubble field at Ladyhall (PR04) in the scaring zone; a gas cylinder was also seen at the edge of this field from mid-December 2012 to early February 2013;
- From early February until early May 2013 various scarers, canes with streamers and gas guns could be seen and heard at Netherwood Mains (KM10, KM16 & KM17);
- From early March to end of April 2013 two cones with plastic bags on them could be seen at Glenstocken (R03);
- From mid to late April 2013 one or two green barrels were seen at Lands (S39);
- In late April it was noted out with the Scheme monitoring that canes with streamers had been deployed on some of the western fields at Thwaite and on the saltmarsh in that area.

3.8 Count section dates and times of coverage

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

	Wednesday	Friday	Tuesday	Friday	Sunday	Tuesday	Thursday	Thursday	Wednesday	Saturday	Monday	Saturday	Monday
	24/10/12	16/11/12	27/11/12	14/12/12	30/12/12	15/01/13	24/01/13	07/02/13	20/02/13	09/03/13	18/03/13	13/04/13	22/04/13
Thwaite	09:00	11:00	15:00	11:30	10:00	16:00	15:30	14:00	14:30	12:00	09:30	12:00	08:00
Nith	08:00	09:30	14:00	09:00	15:45	14:45	14:30	12:00	08:30	10:00	07:00	12:30	12:30
Southernness	11:30	09:30	09:00	10:00	13:30	09:00	11:00	10:30	15:00	08:30	10:30	16:30	17:00
Colvend	12:00	10:30	12:30	09:00	14:45	13:00	09:30	08:30	10:15	12:00	11:30	09:30	18:00

In summary, these dates represent an even spread of two counts on each day of the week except Sunday when there was one, giving 13 counts in total.

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 February and March to arrange meetings to discuss goose issues. 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 would not give a good representation of goose use. Some wondered what would happen when the Scheme ended on 1 April 2013 due to lack of funding. Farmers engaging in conversations about geese are noted in Table 9.

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

24/10/12	
16/11/12	
27/11/12	
14/12/12	Stuart Brown said geese had been in typical fields so far.
30/12/12	
15/01/13	Jim Kirkland said geese had heavily used pastures P19 & P20 mainly in October and November, less so now. He had seen some use of field P15 which he hadn't seen before with flocks on the north side of the Southerness road. He wondered if that was due to field P43b being in kale and so less food available than usual in typical feeding area. Otherwise goose use of area was fairly normal he felt.
24/01/13	Stephen Roan said they had been coming into Colvend fields for about one month. He said that last winter had been quiet but this year there were more about.
	Jack Graham said counts did not represent very well the number of geese using his fields, he said birds started there most mornings but could understand how count times and dates might not find birds there. He felt that the birds were in the usual fields and that Midtown was still a core goose area. With regard to April he felt that he might have to try and scare if neighbours scared geese onto his land. This might involve the use of a gas gun as he would have no choice although he felt they would likely be very ineffective.
	Stephen (& Stuart) Brown felt count cycle was useless and did not represent goose use of Newfield in particular and said he has always felt that even when the counts were more frequent. He felt there should just be an assessment of field damage in April as judged by how the field looks - you can see which fields have been well used by the geese.
	Stephen and Stuart said they would be using a gas gun to disturb the geese from 1st April, they felt it was a great shame that this hadn't been avoided and that more money had not been available from other areas of the Scheme less well used by the geese. They wondered, along with Ian Brown how a licence had been issued to someone outside the Scheme to shoot geese and whether this set a precedent for those inside the Scheme.
	Alastair Wylie felt the counts only showed some goose use of his fields but had missed other use and were not frequent enough. He felt that he may have to scare geese in April if others started scaring them onto his land.
	Alastair Martin felt the counts did not pick up on the fields being used by the geese but could understand how a picture would build up over many years and that the key fields would still feature.
07/02/13	Andrew Marshall didn't dispute any of the counts and said it had been fairly quiet.
	Spoke to Doug Freeman's wife who said she wasn't aware of any issues although Doug would get in touch if there were.
20/02/13	
09/03/13	Steven Murray at West Preston was happy that counts represented field use although mentioned some use of golf course fields (not the field in kale) and that the field out front of the farm by the road had not been picked up on in the counts.
18/03/13	Roger Guy said he didn't have any specific problems with the field use maps but questioned validity of Scheme as a whole being based on goose days as he felt geese could find a field and use it heavily just over a short random period and that this was enough to affect the sward but would be unlikely to get picked up by counters. He also wondered what the "confidence" was in the figures from the counts i.e. how much they represented the real situation and whether anyone had looked at this statistically and put a figure on it.
	John Jamieson felt there had been heavy use of some fields on top of Ward Law over last few weeks during the cold period but otherwise accounts of field use matched with that seen.
	Thomas Threlkeld said nothing different to other years and acknowledged counters do the best they can in the amount of time they get. Felt goose use had been heavier on fields just off the Scheme to the north of the drive leading up to Lantonside but that goose use on fields by the shore road in front of the house had been less by contrast. Thought there was not a lot of food about and so birds dispersed.
13/04/13	
22/04/13	Stephen Roan at Colvend said the geese had been "bad" the past two weeks and had been in the fields right up to the farm stading.

3.10 Coordinated Svalbard Barnacle Goose population count totals

Table 10. Coordinated Svalbard Barnacle Goose population count totals for the Solway 2012-2013.

Count section	03- Oct	10- Oct	24- Oct	31- Oct	16- Nov	14- Dec	17- Jan	21- Feb	18- Mar	10- Apr	17- Apr	24- Apr	01- May	08- May	15- May	16- May	22- May	29- May
Annan to Gretna	0	0	0	720	0	0	3600	0	0	0	n.c.	5000	6400	3100	370	0	0	0
Ruthwell to Cummertrees	0	0	0	1950	160	5756	3660	2800	75	1964	n.c.	140	0	0	0	0	0	0
Longbridgemuir	0	0	0	0	0	0	0	0	0	0	n.c.	0	0	0	0	0	0	0
Caerlaverock	9620	10133	4419	7620	7281	9905	6100	4905	5170	2173	n.c.	5400	3020	0	0	0	0	0
Kirkconnell & Ward Law	1570	212	2515	2160	3370	2403	6990	4000	110	6900	n.c.	1000	490	0	0	0	0	0
Mersehead to Airds Pt	4760	6300	8385	9575	4816	6514	7012	2583	6190	3912	n.c.	2570	3854	800	0	0	0	0
Caulkerbush to Rascarrel	0	500	0	n.c.	210	1400	700	2700	120	n.c.	1500	0	0	0	0	0	0	0
Dundrennan to Wigtown	0	0	0	0	0	0	450	n.c.	2510	1300	n.c.	170	0	0	0	0	0	0
Rockcliffe Marsh	7450	9930	2000	1630	6280	1730	410	3560	11730	9380	n.c.	10350	9630	23330	14220	15000	12000	12
Burgh Marsh	0	0	7400	4200	0	0	0	3080	12	300	n.c.	550	7800	0	0	0	0	0
Bowness to Grune	80	50	6902	3186	6216	2320	2901	4707	2015	5279	n.c.	3715	850	0	0	0	0	0
Total	23480	27125	31621	31041	28333	30028	31823	28335	27932	31208	1500	28895	32044	27230	14590	15000	12000	12
Notes										1	2							

¹ Counts in sections from Kirkconnell to Cummertrees including Caerlaverock were carried out on 13 April due to unforeseen circumstances (this count total was therefore not included in the calculation of the "Adopted Count").

² Count was cancelled due to very poor weather conditions.

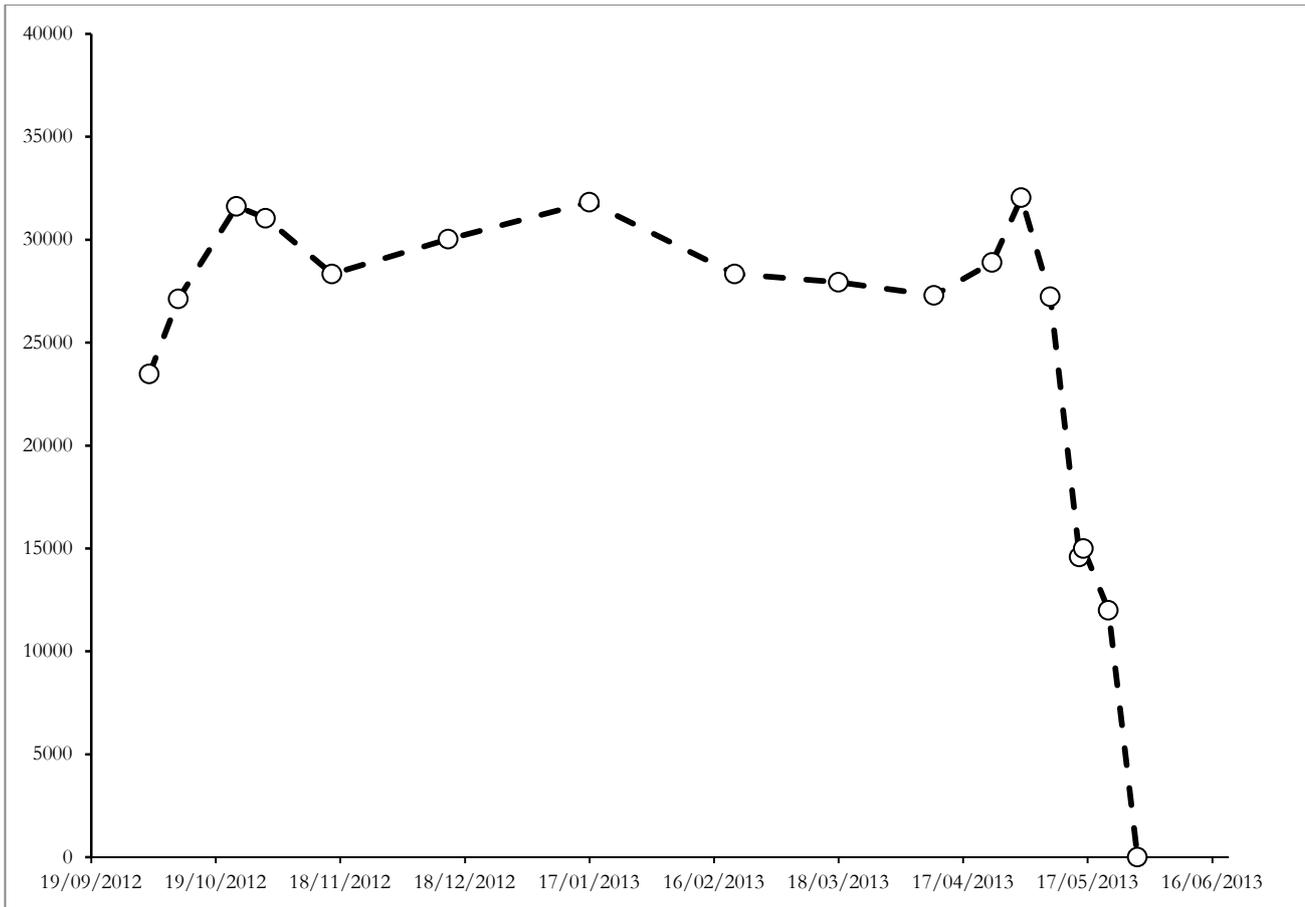


Figure 12. The total population of Svalbard Barnacle Geese recorded on the Inner Solway from October 2012 to May 2013.

Total population counts of Svalbard Barnacle Geese were already more than 23,000 by the first count on 3 October due to a rapid and sudden build up in the first few days of October after a late slow start to the season with the first 91 birds recorded at Caerlaverock on 23 September 2012 (Table 10; Figure 12). The numbers recorded then fluctuated as in previous years mainly in relation to count visibility conditions and goose dispersal. Due to this 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 2012-2013 the counts of 31,621 on 24 October, 31,041 on 31 October, 30,208 on 14 December, 31,823 on 17 January, 28,895 on 24 April and 32,044 on 1 May (the maximum count recorded), fulfil this criterion and are thus averaged to produce **an adopted population total of 31,000 Barnacle Geese** (rounded up to the nearest 100; compared to 33,900 in 2011-2012).

3.11 Brood size and juvenile productivity of the Svalbard Barnacle Goose

Table 11. Brood size and juvenile productivity for Svalbard Barnacle Geese on the Solway in winter 2012-2013.

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
04/10/12	930	480	18	E11	stubble	10	1	2					3.8	LRG
04/10/12	2300	1820	37	O5	pasture	14	7	3					2.0	LRG
08/10/12	1300	730	11	O5	pasture	5	3						1.5	LRG
08/10/12	225	225	12	O9	pasture	3	3	1					5.3	LRG
08/10/12	1760	1560	66	OM1	merse	23	11	7					4.2	LRG
09/10/12	1350	640	46	E14	stubble	11	13	3					7.2	LRG
12/10/12	380	370	21	A8	pasture	7	4	2					5.7	LRG
07/11/12	470	460	28	KM6	merse	1	4	5		1			6.1	LRG
08/11/12	520	520	4	A5	pasture	2	1						0.8	LRG
21/11/12	1450	690	37	P5	pasture	16	7	1	1				5.4	LRG
27/11/21	2200	605	58	X79	pasture								9.6	LRG
19/12/12	153	153	22	E12	pasture								14.4	LRG
08/01/13	366	366	55	KM47	pasture								15.0	LRG
09/01/13	1010	540	54	X118	pasture								10.0	LRG
09/01/13	880	474	27	X1	pasture								5.7	LRG
09/01/13	189	189	9	X80	pasture								4.8	LRG
09/01/13	1100	650	20	V6	pasture								3.1	LRG
14/01/13	3400	700	23	P5	pasture								3.3	LRG
15/01/13	490	400	56	X107	pasture								14.0	LRG
17/01/13	3660	300	27	PR79	pasture								9.0	LRG
17/01/13	3600	500	55	BH17	pasture								11.0	LRG
Total		12372	686											
Overall juv%			5.54			Brood size totals:								
						92	54	24	1	1	0	Total broods	172	
						Number of juveniles per brood size category:						Max %juvs	15.0	
						92	108	72	4	5	0	Total juvs	281	
												Mean brood	1.63	

The juvenile productivity of the Svalbard Barnacle Goose observed in flocks sampled on the Inner Solway from October 2012 to January 2013 from Redkirk in the east to Mersehead in the west ranged from 0.8% to 15.0% (6.1% to 23.5% in 2011-2012) with a mean of 5.5% young from 21 flocks with 12,372 geese sampled (12.8%; n = 15 flocks; 6,643 geese sampled in 2011-2012). Across the same area, the total number of broods sampled was 172, with a mean family size of 1.6 young, range 1-5 young (2.1 young, n = 124, range 1-5 young in 2011-2012).

3.12 Leucistic Barnacle Geese

Up to four different leucistic Barnacle Geese were recorded in winter 2012-2013 including a family group of three that are probably the same birds that have used that area for the last three winters. The leucistic birds were mainly seen in the Bowness to Grune area or at Rockcliffe, Cumbria and the single bird was often seen in the Southernness to Colvend area although also in the Redkirk area, with two Ross's Geese seen briefly together on Rockcliffe Marsh on 16 November 2012.

3.13 Other geese

A Red-breasted Goose was reported mid-winter in the Southernness area and a Richardson's Canada Goose was seen at WWT Caerlaverock on 29 April 2013 in a flock of Barnacle Geese on the reserve.

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, Peter Williams for covering Rascarrel to Sandyhills and Colin Bartholomew (who replaced Ben Mitchell as counter) for covering the Southwick area to Drumburn. Counts in the Caerlaverock area were also made by Mike Youdale and Brian Morrell.