



**Svalbard Barnacle Goose distribution
around the Solway Firth 2008-2009**

Flock counts from the Solway Barnacle Goose
Management Scheme area

WWT Conservation Programmes Report

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Executive Summary

A total of 36 route counts were carried out in winter 2008-2009 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 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 29,900 geese (the mean of five counts that were within 10% of the maximum of 31,111 recorded, rounded down to the nearest 100), a slight increase on last winter's estimate of 29,000 geese. Brood sizes were very consistent this winter at 2.0 goslings per family with very few large broods recorded (range 1-4 goslings; 162 families sampled), with an average juvenile productivity of 8.7% (range 1.7-13.6% young; 10,300 birds sampled) compared to 2.4 goslings and 12.8% young respectively for last winter. Four different leucistic Barnacle Geese were recorded in winter 2008-2009.

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 under 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.

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 and 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

As with previous surveys of the Scheme area, counts were carried out within a 6-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 as with those geese flighting off the Blackshaw Bank roost to utilise fields up the River Nith at Greenmerse and Kirkconnell. The time of 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.

Through liaison with the current network of volunteer goose counters on the Solway, significant use of any fields outwith the current survey area was monitored with addition of these areas to the traditional survey route if significant use by the geese was recorded. Particular attention was given to the areas around Priestside and also Auchencairn and Rascarrel as these areas have had fairly regular flocks in previous years.

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 with 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 the season progressed it soon became clear that the Cummertrees/Hurkledale/Priestside area was being fairly well used by the Barnacle Geese whereas the section from north of Ward Law covering the Quay Hill was not being used. In previous years the Priestside section has been dropped due to lack of goose use but this winter it was surveyed and the Quay Hill section was dropped after agreement with SNH to keep the mileage within budget. During the co-ordinated counts of geese on the Solway, it was felt that the low counts being recorded in the Auchencairn area did not justify extension of the route count methodology to that area with most birds choosing to visit the Boreland of Colvend area instead this winter. From March onwards significant numbers of Barnacle Geese began using the Wigtown area 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. This work is now part-funded by SNH under a separate grant.

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 on the Solway. The dates, land use types, and flock sizes used for sampling were 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 in which the geese were present in the Barnacle Goose Management Scheme area.

SEPTEMBER 2008 LAVER'S LIVERPOOL (Alfred) 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			
		HIGH WATER		LOW WATER		SUN		MOON			
		Morning		Afternoon		Morning		Afternoon		Rise Set	
Date	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Rise Set	Ph.
1 Mon		1208 9.6 31.5	0639 0.5 1.6	1840 0.9 3.0	0522 1901	0727 1908					
2 Tue	0023 9.9 32.5	1243 9.5 31.2	0712 0.6 2.0	1914 1.0 3.3	0523 1858	0847 1918					
3 Wed	0057 9.7 31.8	1315 9.3 30.5	0743 0.9 3.0	1946 1.2 3.9	0525 1856	1005 1931					
4 Thu	0131 9.4 30.8	1348 9.0 29.5	0813 1.4 4.6	2019 1.7 5.6	0527 1854	1123 1946					
5 Fri	0203 9.9 29.2	1419 8.6 28.2	0842 1.9 6.2	2049 2.2 7.2	0529 1851	1240 2006					
6 Sat	0235 9.4 27.6	1454 8.1 26.6	0909 2.5 8.2	2120 2.8 9.2	0530 1849	1352 2034					
7 Sun	0313 7.7 25.3	1536 7.6 24.9	0940 3.2 10.5	2203 3.4 11.2	0532 1846	1457 2114					
8 Mon	0403 7.1 23.3	1634 7.1 23.3	1026 3.7 12.1	2319 3.8 12.5	0534 1844	1550 2207					1406
9 Tue	0519 6.7 22.0	1802 6.9 22.6		1209 4.1 13.5	0536 1842	1629 2313					
10 Wed	0714 6.7 22.0	1945 7.2 23.6	0105 3.8 12.5	1348 3.8 12.5	0537 1839	1658					
11 Thu	0831 7.3 24.0	2047 7.9 25.9	0227 3.3 10.8	1455 3.2 10.5	0539 1837	1718 0028					
12 Fri	0919 8.0 26.2	2133 8.5 27.9	0326 2.6 8.5	1546 2.6 8.5	0541 1834	1734 0148					
13 Sat	0956 8.5 27.9	2211 9.1 29.9	0412 2.0 6.6	1628 2.0 6.6	0543 1832	1746 0307					
14 Sun	1034 8.9 29.2	2248 9.4 30.8	0453 1.5 4.9	1706 1.5 4.9	0544 1829	1757 0428					
15 Mon	1109 9.3 30.5	2323 9.7 31.8	0531 1.1 3.6	1744 1.1 3.6	0546 1827	1808 0550					
16 Tue	1142 9.5 31.2	2359 9.9 32.5	0604 0.7 2.3	1820 0.8 2.6	0548 1825	1819 0714					0915
17 Wed		1218 9.5 31.2	0644 0.6 2.0	1858 0.7 2.3	0549 1822	1833 0841					
18 Thu	0034 9.9 32.5	1253 9.5 31.2	0721 0.6 2.0	1935 0.9 3.0	0551 1820	1851 1010					
19 Fri	0111 9.7 31.8	1331 9.2 30.2	0756 0.9 3.0	2011 1.2 3.9	0553 1817	1916 1142					
20 Sat	0150 9.4 30.8	1410 8.9 29.2	0831 1.4 4.6	2052 1.6 5.2	0555 1815	1953 1309					
21 Sun	0235 8.8 28.9	1456 8.4 27.6	0911 1.9 6.2	2140 2.2 7.2	0556 1812	2048 1424					
22 Mon	0320 8.2 26.9	1600 7.9 25.9	1001 2.5 8.5	2246 2.7 8.9	0558 1810	2201 1520					
23 Tue	0448 7.6 24.9	1728 7.6 24.9	1117 3.1 10.2		0600 1807	2326 1558					0906
24 Wed	0622 7.5 24.6	1900 7.8 25.6	0300 2.8 9.2	1305 3.2 10.5	0602 1805	1623					
25 Thu	0749 7.9 25.9	2017 8.0 26.9	0220 2.4 7.9	1427 2.7 8.9	0603 1803	0054 1641					
26 Fri	0856 8.5 27.9	2115 9.0 29.5	0312 1.9 6.2	1529 2.2 7.2	0605 1800	0221 1654					
27 Sat	0947 9.0 29.5	2203 9.4 30.8	0408 1.3 4.3	1619 1.7 5.6	0607 1759	0345 1705					
28 Sun	1028 9.3 30.5	2243 9.7 31.8	0455 1.0 3.3	1700 1.4 4.6	0609 1755	0506 1716					
29 Mon	1106 9.5 31.2	2320 9.8 32.2	0534 0.9 3.0	1737 1.2 3.9	0611 1753	0625 1729					
30 Tue	1140 9.5 31.2	2355 9.7 31.8	0608 0.9 3.0	1811 1.1 3.6	0612 1750	0743 1738					0913

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LAVER'S LIVERPOOL (Alfred) TIDES OCTOBER 2008

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

		● New Moon		◐ First Quarter		○ Full Moon		◑ Last Quarter			
		HIGH WATER		LOW WATER		SUN		MOON			
		Morning		Afternoon		Morning		Afternoon		Rise Set	
Date	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Time M Ft	Rise Set	Ph.
1 Wed		1212 9.4 30.8	0639 1.0 3.3	1844 1.2 3.9	0614 1748	0902 1752					
2 Thu	0027 9.5 31.2	1243 9.3 30.5	0708 1.2 3.9	1917 1.4 4.6	0616 1746	1019 1810					
3 Fri	0058 9.1 29.9	1314 9.0 29.5	0736 1.6 5.2	1948 1.8 5.9	0618 1743	1134 1835					
4 Sat	0129 8.7 28.5	1343 8.7 28.5	0803 2.1 6.9	2017 2.3 7.5	0619 1741	1243 1910					
5 Sun	0202 8.3 27.2	1417 8.2 26.9	0828 2.6 8.5	2048 2.8 9.2	0621 1738	1340 1958					
6 Mon	0237 7.8 25.6	1455 7.8 25.6	0859 3.1 10.2	2127 3.3 10.8	0623 1736	1425 2058					
7 Tue	0322 7.2 23.6	1550 7.3 24.0	0941 3.7 12.1	2232 3.7 12.1	0625 1734	1457 2208					0906
8 Wed	0432 6.8 22.3	1713 7.0 23.0	1103 4.1 12.5		0627 1731	1521 2324					
9 Thu	0520 6.7 22.0	1853 7.2 23.6	0015 3.7 12.1	1257 4.0 13.1	0628 1729	1539					
10 Fri	0748 7.3 24.0	2003 7.8 25.6	0138 3.3 10.8	1410 3.4 11.2	0630 1727	1552 0043					
11 Sat	0840 7.9 25.9	2052 8.5 27.9	0241 2.6 8.5	1505 2.7 8.9	0632 1724	1604 0203					
12 Sun	0920 8.5 27.9	2133 9.0 29.5	0332 2.0 6.6	1551 2.1 6.9	0634 1722	1615 0323					
13 Mon	0958 9.0 29.5	2212 9.5 31.2	0415 1.5 4.9	1634 1.5 4.9	0636 1720	1626 0446					
14 Tue	1035 9.4 30.8	2259 9.8 32.2	0457 1.0 3.3	1714 1.1 3.6	0638 1717	1639 0613					2004
15 Wed	1113 9.6 31.5	2330 10.0 32.8	0538 0.7 2.3	1756 0.8 2.6	0639 1715	1656 0743					
16 Thu	1151 9.7 31.8		0619 0.6 2.0	1837 0.7 2.3	0641 1713	1718 0918					
17 Fri	0011 9.9 32.5	1232 9.6 31.5	0658 0.7 2.3	1918 0.8 2.6	0643 1711	1752 1048					
18 Sat	0053 9.7 31.8	1312 9.4 30.8	0736 1.0 3.3	2000 1.1 3.6	0645 1708	1842 1211					
19 Sun	0136 9.2 30.2	1357 9.0 29.5	0816 1.5 4.9	2045 1.6 5.2	0647 1706	1951 1315					
20 Mon	0227 8.7 28.5	1449 8.5 27.9	0859 2.1 6.9	2139 2.1 6.9	0649 1704	2114 1358					
21 Tue	0329 8.1 26.6	1557 8.1 26.6	0954 2.7 8.9	2256 2.5 8.2	0651 1702	2242 1473					1157
22 Wed	0448 7.7 25.3	1720 7.9 25.9	1119 3.1 10.2		0652 1659	1447					
23 Thu	0612 7.7 25.3	1841 8.1 26.6	0226 2.5 8.2	1251 3.1 10.2	0654 1657	0008 1502					
24 Fri	0729 8.0 26.2	1953 8.5 27.9	0142 2.2 7.2	1403 2.7 8.9	0656 1655	0132 1514					
25 Sat	0831 8.5 27.9	2049 8.9 29.2	0247 1.9 6.2	1502 2.3 7.5	0658 1653	0252 1524					
26 Sun	0920 8.8 28.9	2136 9.2 30.2	0340 1.6 5.2	1550 2.0 6.6	0700 1651	0410 1534					
27 Mon	1001 9.1 29.9	2217 9.3 30.5	0424 1.4 4.6	1631 1.7 5.2	0702 1649	0527 1546					
28 Tue	1038 9.2 30.2	2253 9.4 30.8	0502 1.3 4.3	1707 1.5 5.2	0704 1647	0644 1559					2315
29 Wed	1111 9.3 30.5	2327 9.3 30.5	0534 1.3 4.3	1744 1.5 4.9	0705 1645	0801 1616					
30 Thu	1144 9.3 30.5		0556 1.4 4.6	1818 1.5 4.9	0708 1643	0917 1639					
31 Fri	0001 9.1 29.9	1215 9.1 29.9	0637 1.6 5.2	1851 1.7 5.8	0710 1641	1028 1710					

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NOVEMBER 2008 LAVER'S LIVERPOOL (Alfred) TIDES

		● New Moon		◐ First Quarter		○ Full Moon		◑ Last Quarter							
		HIGH WATER				LOW WATER				SUN		MOON			
		Morning		Afternoon		Morning		Afternoon		Rise Set		Rise Set		Ph.	
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft
1 Sat	0032	8.8	28.9	1246	8.9	29.2	0705	1.9	5.9	1922	2.0	6.6	0711 1639	1130 1753	
2 Sun	0104	8.5	27.9	1317	8.7	28.5	0732	2.2	7.2	1953	2.3	7.5	0713 1637	1219 1848	
3 Mon	0136	8.2	26.9	1350	8.4	27.6	0800	2.5	8.2	2027	2.6	8.5	0715 1635	1256 1954	
4 Tue	0211	7.9	25.9	1430	8.1	26.6	0834	3.0	9.8	2109	3.0	9.8	0717 1633	1322 2107	
5 Wed	0256	7.5	24.6	1520	7.7	25.3	0920	3.4	11.2	2207	3.2	10.5	0719 1631	1342 2223	
6 Thu	0357	7.1	23.3	1629	7.4	24.3	1025	3.7	12.1	2321	3.3	10.8	0721 1630	1357 2340	◐ 1405
7 Fri	0517	7.0	23.0	1749	7.5	24.6	1151	3.8	12.5				0723 1628		
8 Sat	0640	7.3	24.0	1903	7.8	25.6	0939	3.1	10.2	1311	3.4	11.2	0725 1626	1420 0558	
9 Sun	0743	7.8	25.6	2000	8.4	27.6	0146	2.6	8.5	1414	2.8	9.2	0727 1624	1431 0218	
10 Mon	0834	8.3	27.2	2049	8.9	29.2	0245	2.1	6.9	1509	2.2	7.2	0729 1623	1443 0340	
11 Tue	0919	8.8	28.9	2136	9.3	30.5	0337	1.6	5.2	1558	1.7	5.6	0730 1621	1458 0508	
12 Wed	1003	9.3	30.5	2221	9.6	31.5	0425	1.2	3.9	1648	1.2	3.9	0732 1619	1518 0640	
13 Thu	1046	9.5	31.2	2306	9.8	32.2	0511	0.9	3.0	1734	0.9	3.0	0734 1618	1547 0815	
14 Fri	1130	9.7	31.8	2352	9.7	31.8	0555	0.7	2.3	1820	0.8	2.6	0736 1616	1630 0945	◐ 0919
15 Sat				1215	9.6	31.5	0639	0.8	2.6	1907	0.8	2.6	0738 1615	1734 1100	
16 Sun	0040	9.5	31.2	1301	9.5	31.2	0722	1.1	3.6	1955	1.0	3.3	0740 1613	1855 1153	
17 Mon	0129	9.2	30.2	1350	9.2	30.2	0806	1.5	4.9	2045	1.4	4.6	0742 1612	2025 1229	
18 Tue	0224	8.7	28.5	1445	8.9	28.9	0854	2.0	6.6	2143	1.7	5.6	0744 1611	2155 1522	
19 Wed	0326	8.2	26.9	1546	8.5	27.9	0951	2.5	9.2	2250	2.1	8.9	0745 1609	2323 1753	◐ 2133
20 Thu	0432	7.8	26.2	1657	8.3	26.2	1103	2.9	9.8	2387	2.5	8.9	0747 1608	1321	
21 Fri	0544	7.9	25.9	1808	8.2	26.9	0001	2.2	7.2	1219	2.5	8.5	0749 1607	0040 1330	
22 Sat	0653	7.9	25.9	1917	8.3	27.2	0108	2.2	7.2	1325	2.8	9.2	0750 1605	0159 1343	
23 Sun	0756	8.2	26.6	2017	8.5	28.9	0209	2.2	7.2	1426	2.8	9.2	0752 1604	0314 1354	
24 Mon	0848	8.4	26.9	2108	8.8	28.2	0304	2.1	6.9	1516	2.7	7.9	0753 1603	0432 1406	
25 Tue	0935	8.6	28.2	2150	9.0	28.9	0349	2.0	6.6	1610	2.7	7.2	0756 1602	0549 1422	
26 Wed	1011	8.8	28.9	2225	8.8	28.9	0429	1.8	6.2	1643	2.0	6.5	0757 1601	0704 1442	
27 Thu	1048	8.9	29.2	2308	8.8	28.9	0506	1.8	5.9	1721	1.9	6.2	0759 1600	0818 1511	
28 Fri	1121	9.0	29.5	2340	8.7	28.5	0540	1.8	5.9	1759	1.9	6.2	0800 1559	0821 1550	◐ 1655
29 Sat	1154	9.0	29.5				0612	1.9	6.2	1834	2.0	6.6	0802 1559	1015 1641	
30 Sun	0013	8.6	28.2	1227	8.9	29.2	0641	2.0	6.6	1907	2.0	6.6	0804 1558	1055 1745	

JANUARY 2009

LAVER'S LIVERPOOL TIDES

● New Moon ◐ First Quarter ○ Full Moon ◑ Last Quarter													
HIGH WATER				LOW WATER				SUN		MOON		Ph.	
Morning		Afternoon		Morning		Afternoon		Rise	Set	Rise	Set		
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	
1 Thu	0143	8.5	27.9	1400	8.8	28.8	0809	2.1	6.9	2039	2.0	6.8	0828 1604 1034 2144
2 Fri	0221	8.4	27.9	1438	8.7	28.5	0847	2.3	7.5	2115	2.1	6.9	0827 1606 1044 2259
3 Sat	0301	8.2	26.9	1522	8.6	27.5	0927	2.5	8.2	2157	2.3	7.5	0827 1606 1054
4 Sun	0348	8.0	26.2	1612	8.3	27.2	1015	2.9	9.2	2247	2.6	8.5	0827 1608 1108 0917
5 Mon	0443	7.8	25.6	1711	8.1	26.6	1114	3.0	9.8	2351	2.8	9.2	0827 1609 1120 0138
6 Tue	0549	7.6	24.9	1818	8.0	26.2	1227	3.0	9.8	0826 1610 1139 0306			
7 Wed	0701	7.8	25.6	1930	8.1	26.6	1346	2.8	9.2	0826 1612 1207 0435			
8 Thu	0812	8.1	26.8	2042	8.5	27.8	1501	2.4	7.9	0826 1613 1240 0435			
9 Fri	0816	8.7	28.5	2148	8.9	28.2	1607	2.1	6.9	0824 1614 1352 0717			
10 Sat	1012	9.2	30.2	2242	9.3	30.5	1705	1.2	3.8	0824 1616 1515 0812			
11 Sun	1103	9.6	31.5	2334	9.6	31.5	1802	1.3	4.3	0808 1617 1650 0849			
12 Mon	1153	9.9	32.5				1851	0.9	1.6	0822 1619 1826 0914			
13 Tue	0023	9.7	31.8	1240	10.0	32.8	1939	0.4	1.3	0821 1621 1957 0931			
14 Wed	0110	9.6	31.0	1327	9.8	32.5	2024	0.5	1.6	0821 1622 2123 0945			
15 Thu	0164	9.4	30.8	1411	9.7	31.8	2106	0.8	2.6	0820 1624 2246 0957			
16 Fri	0237	9.1	29.9	1454	9.3	30.5	2209	1.5	4.8	0819 1626 0005 1008			
17 Sat	0320	8.8	28.2	1538	9.0	28.5	0951	2.0	6.8	0818 1627 0005 1020			
18 Sun	0405	8.1	26.8	1625	8.1	26.5	2314	2.6	8.5	0818 1629 0124 1034			
19 Mon	0457	7.6	24.9	1722	7.6	24.9	1128	3.0	9.8	0815 1631 0241 1051			
20 Tue	0603	7.3	24.0	1836	7.2	23.8	0009	3.1	10.2	0814 1633 0356 1114			
21 Wed	0722	7.2	23.8	2000	7.2	23.8	0115	3.3	10.8	0813 1634 0506 1146			
22 Thu	0832	7.8	24.9	2105	7.8	24.9	0227	3.2	10.5	0812 1636 0606 1230			
23 Fri	0926	8.0	26.2	2154	7.8	25.9	0332	2.9	9.5	0810 1638 0655 1326			
24 Sat	1008	8.6	27.9	2238	8.3	27.2	0421	2.5	8.2	0809 1640 0731 1433			
25 Sun	1048	8.8	28.9	2312	8.5	27.9	0503	2.2	7.2	0808 1642 0757 1546			
26 Mon	1126	9.0	28.5	2348	8.7	28.5	0540	1.8	5.2	0806 1644 0816 1702			
27 Tue	1158	9.1	28.9				0615	1.7	5.6	0805 1646 0830 1818			
28 Wed	0018	8.8	28.9	1232	9.2	30.2	0647	1.6	5.2	0803 1647 0842 1933			
29 Thu	0050	8.8	28.9	1305	9.2	30.2	0719	1.6	5.2	0802 1648 0853 2048			
30 Fri	0123	8.9	28.2	1338	9.2	30.2	0751	1.6	5.2	0800 1651 0903 2206			
31 Sat	0158	8.8	28.9	1414	9.1	28.9	0824	1.7	5.8	0758 1653 0914 2325			

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LAVER'S LIVERPOOL TIDES

FEBRUARY 2009

● New Moon ◐ First Quarter ○ Full Moon ◑ Last Quarter													
HIGH WATER				LOW WATER				SUN		MOON		Ph.	
Morning		Afternoon		Morning		Afternoon		Rise	Set	Rise	Set		
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft	
1 Sun	0232	8.7	28.5	1453	8.9	29.2	0859	2.0	6.8	2122	2.0	6.8	0757 1655 0927
2 Mon	0313	8.4	27.8	1538	8.8	28.2	0938	2.3	7.5	2204	2.4	7.9	0755 1657 0944 0048
3 Tue	0403	8.0	26.2	1635	8.1	26.5	1028	2.7	8.9	2302	2.8	9.2	0753 1658 1007 0214
4 Wed	0509	7.6	24.9	1747	7.7	25.3	1144	3.1	10.2				0752 1701 1041 0340
5 Thu	0630	7.5	24.6	1910	7.7	25.3	1321	3.1	10.2	0750 1703 1132 0458			
6 Fri	0755	7.8	25.6	2035	8.0	26.2	1500	2.8	9.5	0748 1705 1243 0600			
7 Sat	0908	8.4	27.6	2142	8.7	28.5	1602	1.8	5.9	0746 1707 1411 0644			
8 Sun	1005	9.1	28.9	2236	9.2	30.2	1700	1.1	3.5	0744 1709 1548 0714			
9 Mon	1054	9.7	31.8	2323	9.6	31.5	1751	0.5	1.6	0742 1711 1720 0734			
10 Tue	1139	10.0	32.8				1804	0.8	2.6	0740 1713 1855 0750			
11 Wed	0007	9.8	32.2	1223	10.1	33.1	1828	0.6	2.0	0738 1715 2015 0803			
12 Thu	0048	9.7	31.8	1304	10.0	32.8	1858	0.5	2.0	0736 1717 2140 0814			
13 Fri	0127	9.5	31.2	1343	9.7	31.8	1906	0.8	2.6	0734 1719 2301 0826			
14 Sat	0205	9.2	30.2	1421	9.3	30.8	1912	1.0	3.3	0732 1721 0040			
15 Sun	0241	8.8	28.9	1458	8.7	28.5	1918	1.7	5.8	0730 1723 0021 0856			
16 Mon	0318	8.2	28.9	1539	8.1	28.8	1930	2.7	8.9	0728 1725 0138 0917			
17 Tue	0402	7.7	26.3	1627	7.4	24.3	1936	3.0	9.8	0726 1727 0252 0945			
18 Wed	0501	7.1	23.3	1728	6.8	22.3	1942	3.4	11.2	0724 1729 0357 1025			
19 Thu	0533	6.9	22.5	1825	6.7	22.0	1948	3.6	11.8	0722 1731 0450 1116			
20 Fri	0602	7.2	23.6	1942	7.2	23.6	1954	3.6	11.8	0720 1733 0531 1220			
21 Sat	0602	7.7	25.3	2133	7.7	25.3	2005	3.2	10.5	0717 1735 0600 1331			
22 Sun	0648	8.3	27.2	2215	8.2	26.8	2003	2.7	8.9	0715 1737 0622 1448			
23 Mon	0727	8.7	28.5	2250	8.5	27.5	2008	2.2	7.2	0713 1739 0658 1502			
24 Tue	1103	9.0	28.5	2323	8.8	28.9	2011	1.8	5.9	0711 1740 0651 1719			
25 Wed	1136	9.2	30.2	2354	8.9	29.2	2015	1.5	4.9	0709 1742 0702 1835			
26 Thu				1208	9.3	30.5	2027	1.3	4.3	0708 1744 0713 1953			
27 Fri	0026	9.1	28.9	1241	9.4	30.8	2039	1.1	3.8	0704 1746 0724 2113			
28 Sat	0057	9.1	28.9	1315	9.4	30.8	2039	1.2	3.9	0702 1748 0736 2235			

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MARCH 2009

LAVER'S LIVERPOOL 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																
HIGH WATER						LOW WATER						SUN		MOON		Ph.
Morning			Afternoon			Morning			Afternoon			Rise	Set	Rise	Set	
Date	Time	M	Ft	Time	M	Ft	Time	M	Ft	Time	M	Ft				
1 Sun	0131	9.1	29.8	1351	9.3	30.5	0802	1.3	4.3	2021	1.4	4.5	0700	1750	0761	
2 Mon	0205	8.9	28.2	1430	9.0	29.5	0836	1.6	5.2	2055	1.7	5.6	0657	1752	0812 0001	
3 Tue	0247	8.6	28.2	1515	8.5	27.9	0916	2.0	6.6	2137	2.3	7.5	0655	1754	0842 0126	
4 Wed	0335	8.1	26.5	1613	7.9	26.9	1005	2.5	8.5	2235	2.9	9.5	0653	1756	0926 0246	
5 Thu	0444	7.5	24.6	1730	7.4	24.3	1125	3.0	9.8				0550	1758	1028 0352	0746
6 Fri	0514	7.3	24.0	1805	7.4	24.3	0001	3.2	10.5	1314	3.0	9.8	0548	1800	1147 0441	
7 Sat	0748	7.7	26.3	2032	7.3	25.9	0150	3.1	10.2	1447	2.4	7.9	0546	1801	1317 0514	
8 Sun	0858	8.5	27.5	2133	8.5	28.2	0314	2.4	7.9	1554	1.5	5.2	0543	1803	1448 0537	
9 Mon	0952	9.1	28.9	2221	9.2	30.2	0414	1.7	5.6	1648	0.8	3.0	0541	1805	1618 0556	
10 Tue	1036	9.6	31.5	2305	9.5	31.5	0503	1.1	3.6	1733	0.4	1.3	0538	1807	1745 0608	
11 Wed	1120	9.9	32.5	2345	9.7	31.8	0547	0.7	2.3	1815	0.1	0.3	0536	1809	1810 0621	○
12 Thu				1200	10.0	32.8	0627	0.5	1.6	1854	0.2	0.7	0534	1811	2033 0632	○ 2316
13 Fri	0022	9.6	31.6	1238	9.8	32.2	0704	0.6	2.0	1930	0.4	1.3	0531	1813	2155 0645	
14 Sat	0057	9.5	31.2	1314	9.5	31.2	0738	0.8	2.6	2003	0.9	3.0	0529	1814	2316 0701	
15 Sun	0132	9.2	30.2	1349	9.1	29.8	0810	1.2	3.8	2032	1.5	4.9	0526	1816		0720
16 Mon	0205	8.8	28.9	1424	8.6	28.2	0839	1.7	5.6	2059	2.1	6.9	0524	1818	0832 0745	
17 Tue	0238	8.3	27.2	1500	8.0	26.2	0911	2.2	7.2	2130	2.7	8.9	0522	1820	0942 0821	
18 Wed	0318	7.8	25.6	1545	7.3	24.0	0952	2.8	9.2	2218	3.3	10.8	0519	1822	0241 0908	
19 Thu	0410	7.2	23.6	1649	6.7	22.0	1057	3.3	10.8	2333	3.7	12.1	0517	1824	0327 1007	1750
20 Fri	0538	6.8	22.3	1841	6.5	21.3	1220	3.5	11.5	0514	1826	0400 1115				
21 Sat	0722	7.0	23.0	2007	6.9	22.6	0100	3.8	12.5	1345	3.3	10.8	0512	1827	0425 1228	
22 Sun	0827	7.5	24.6	2100	7.5	24.6	0224	3.4	11.2	1503	2.8	9.2	0510	1829	0443 1343	
23 Mon	0816	8.1	26.6	2142	8.1	26.6	0327	2.8	9.2	1554	2.2	7.2	0507	1831	0457 1459	
24 Tue	0855	8.6	28.2	2218	8.5	27.9	0412	2.2	7.2	1635	1.7	5.6	0505	1833	0510 1616	
25 Wed	1031	8.9	28.2	2251	8.8	28.9	0450	1.7	5.2	1711	1.3	4.3	0502	1835	0551 1734	
26 Thu	1105	9.2	30.2	2324	9.1	29.5	0525	1.4	3.8	1725	1.4	4.4	0500	1837	0632 1854	
27 Fri	1136	9.4	30.8	2377	9.3	30.2	0550	1.1	3.0	1820	0.9	3.0	0507	1839	0545 2017	1600
28 Sat				1215	9.5	31.2	0634	0.9	3.0	1853	0.8	3.0	0505	1840	0559 2131	
29 Sun	0031	9.3	30.6	1256	9.5	31.2	0719	0.9	3.0	1925	1.0	3.3	0503	1842	0618 2311	
30 Mon	0108	9.2	30.2	1332	9.3	30.5	0744	1.1	3.6	1959	1.3	4.3	0500	1844	0645	
31 Tue	0147	9.0	29.5	1415	9.2	29.2	0812	1.4	4.6	2037	1.7	5.6	0458	1846	0725 0034	

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).

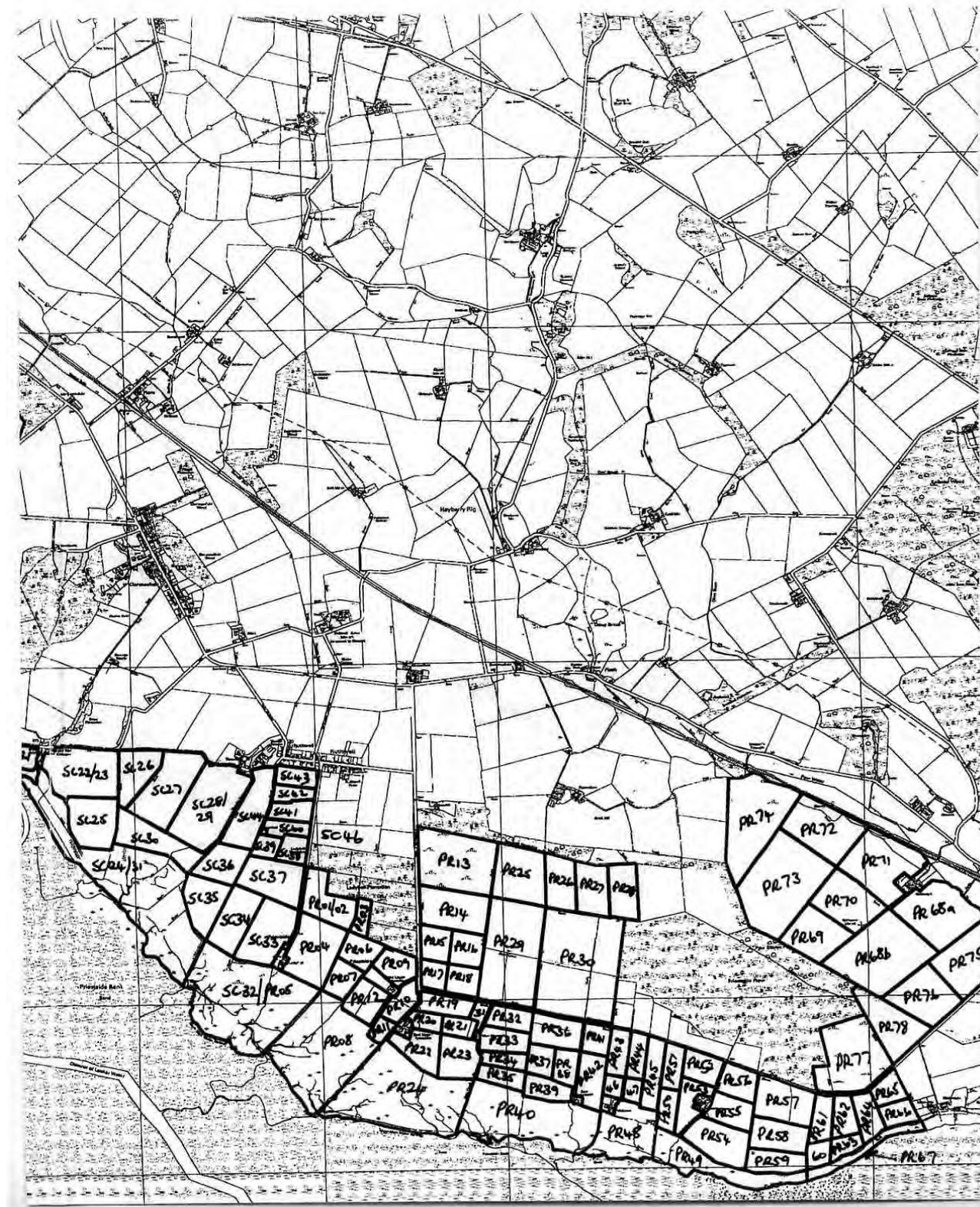


Figure 3. Field codes for the Priestside/Hurkledale/Thwaite area of the Goose Management Scheme.

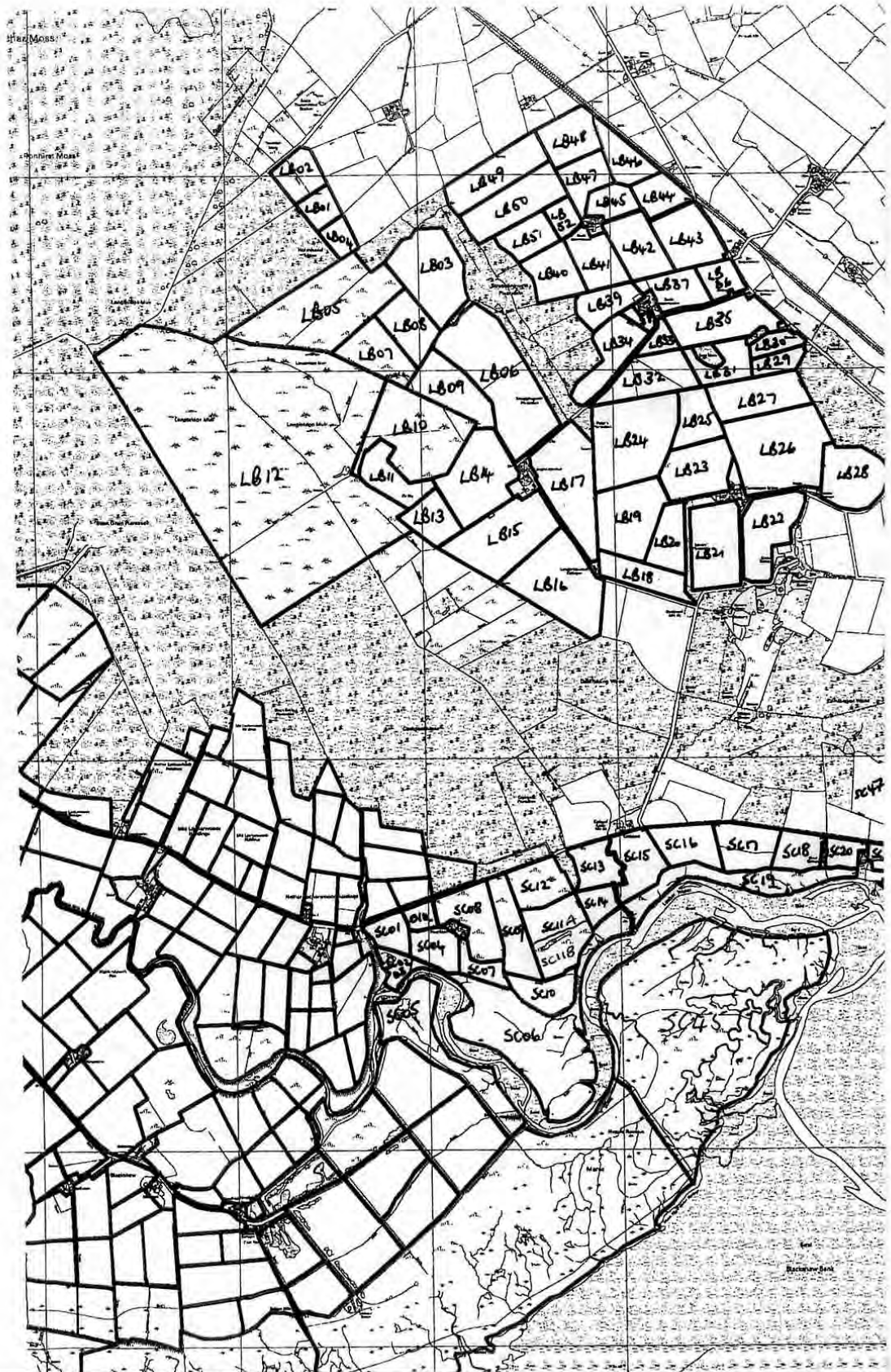


Figure 4. Field codes for the Powhillon/Stanhope/Longbridgemuir area of the Goose Management Scheme.

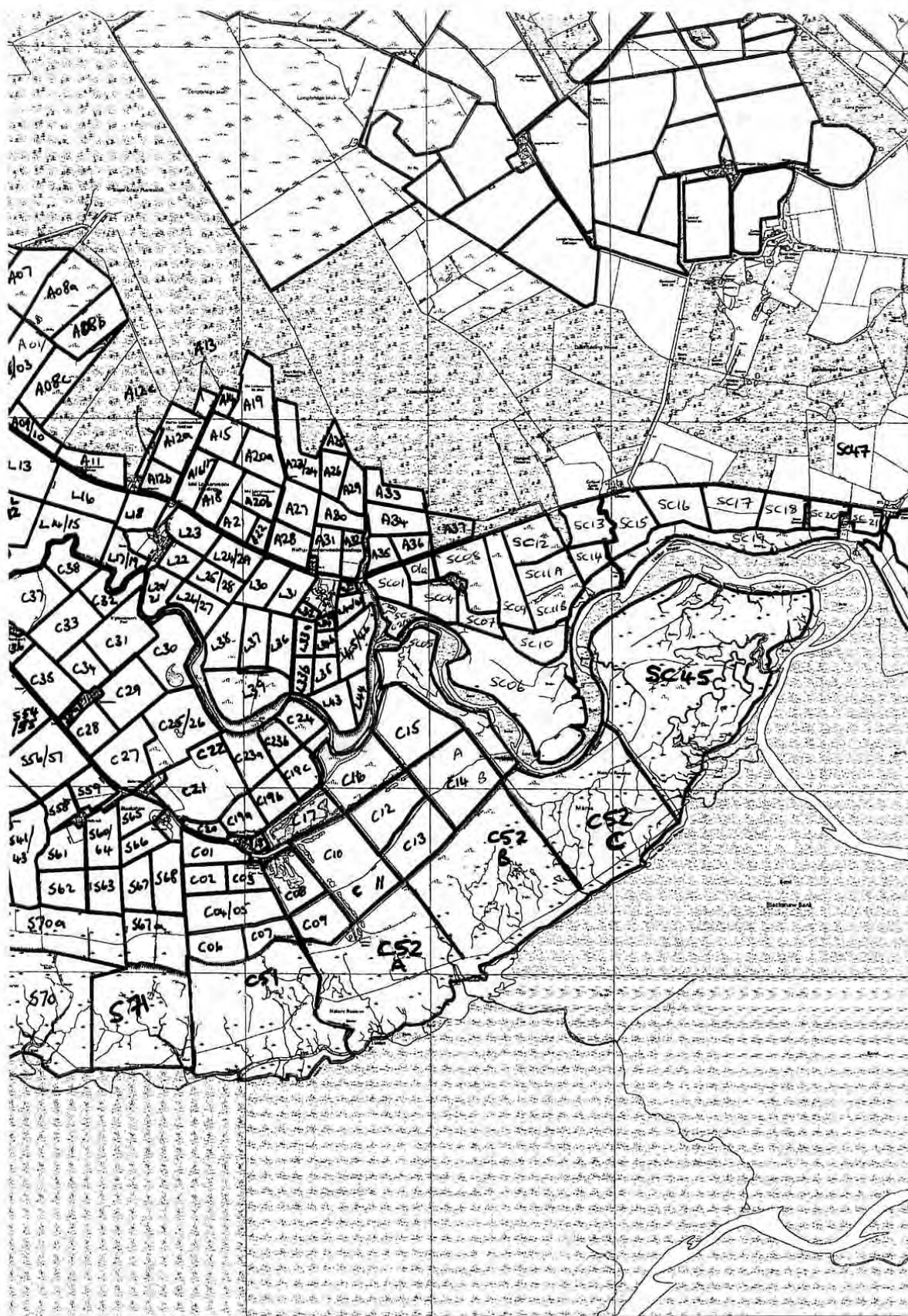


Figure 5. Field codes for the Caerlaverock/Nether Locharwoods area of the Goose Management Scheme.



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

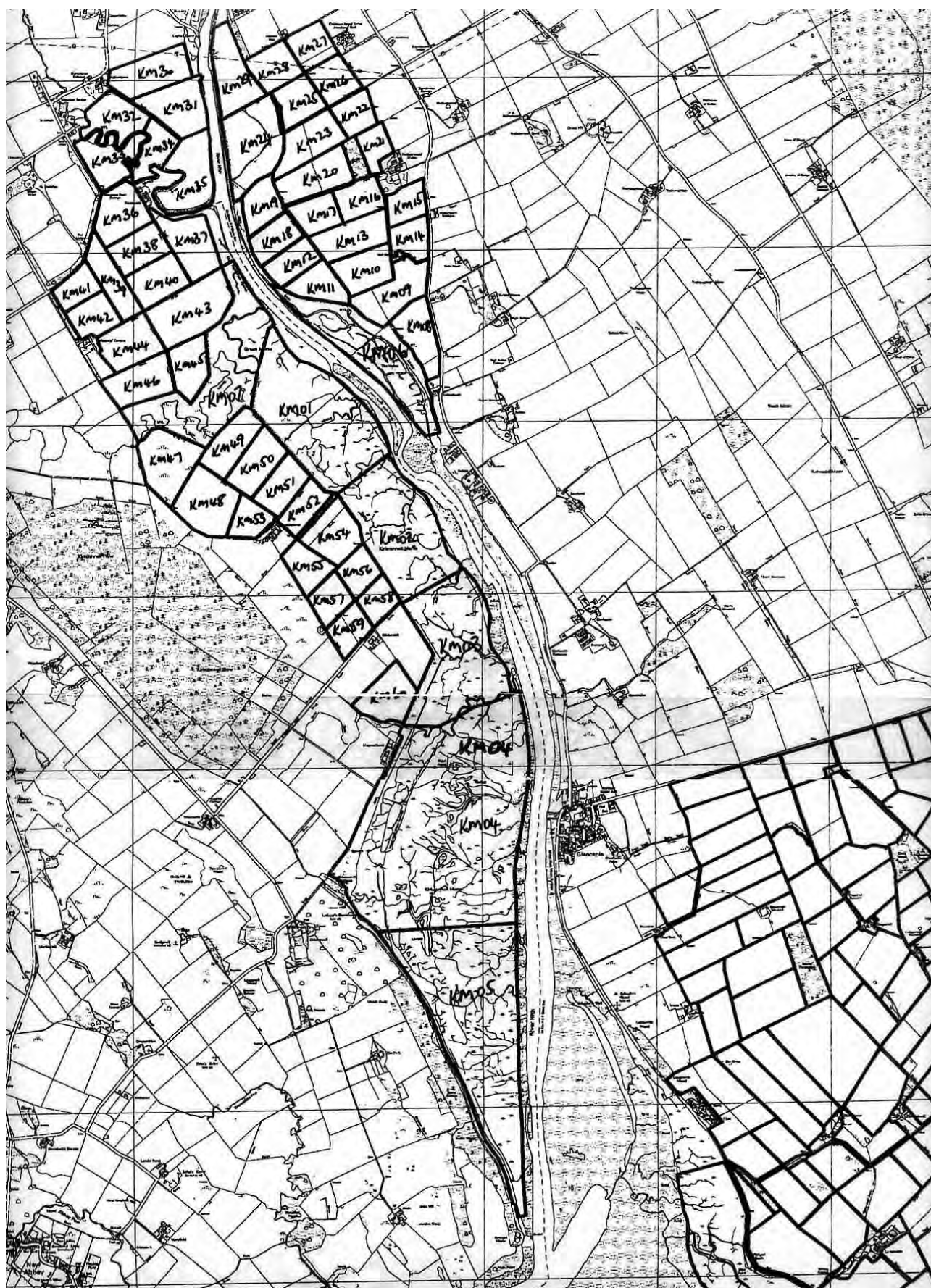


Figure 7. Field codes for the Kelton/Greenmerse/Kirkconnell area of the Goose Management Scheme.

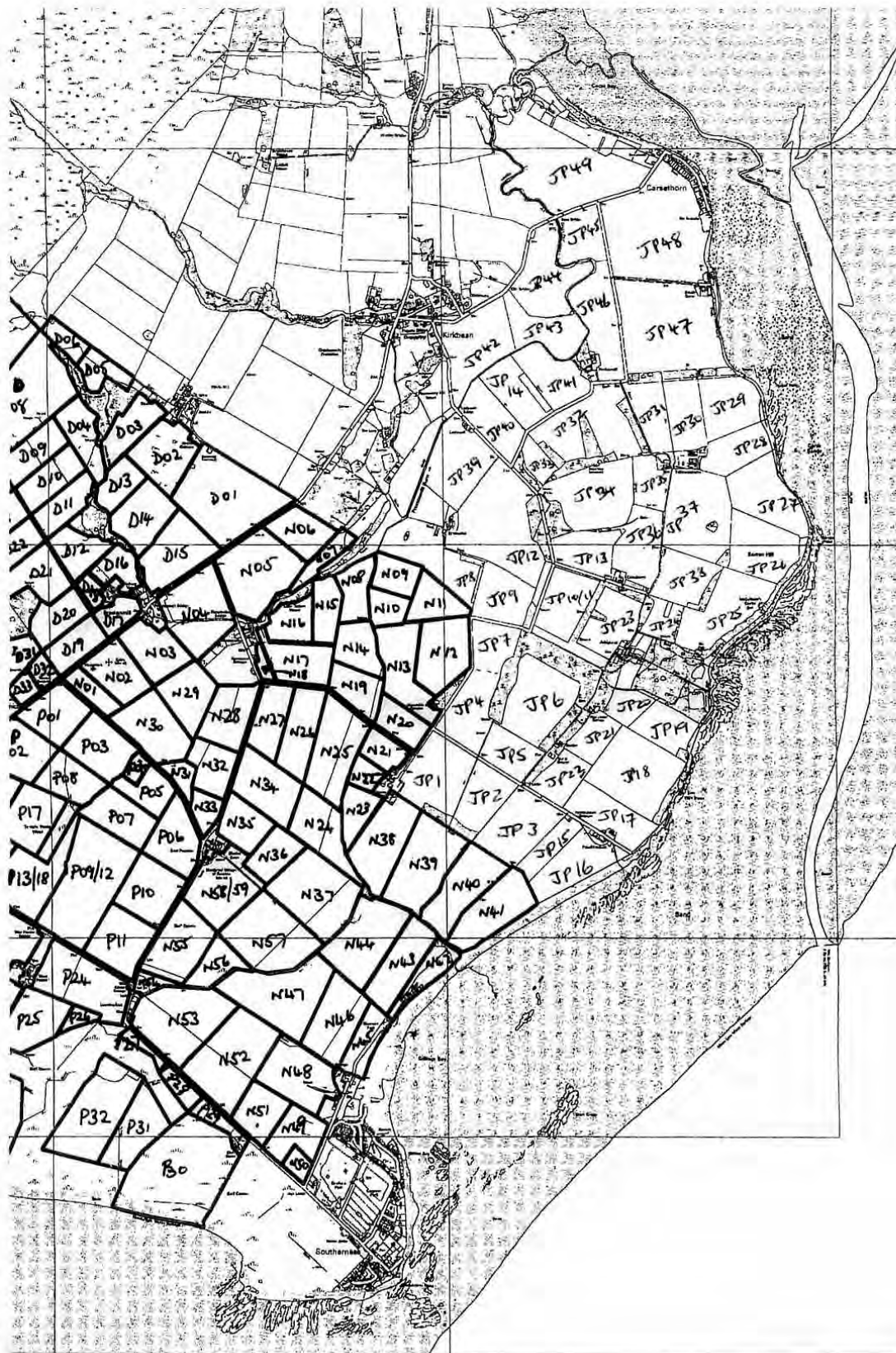


Figure 8. Field codes for the Carsethorn/Southernness area of the Goose Management Scheme.

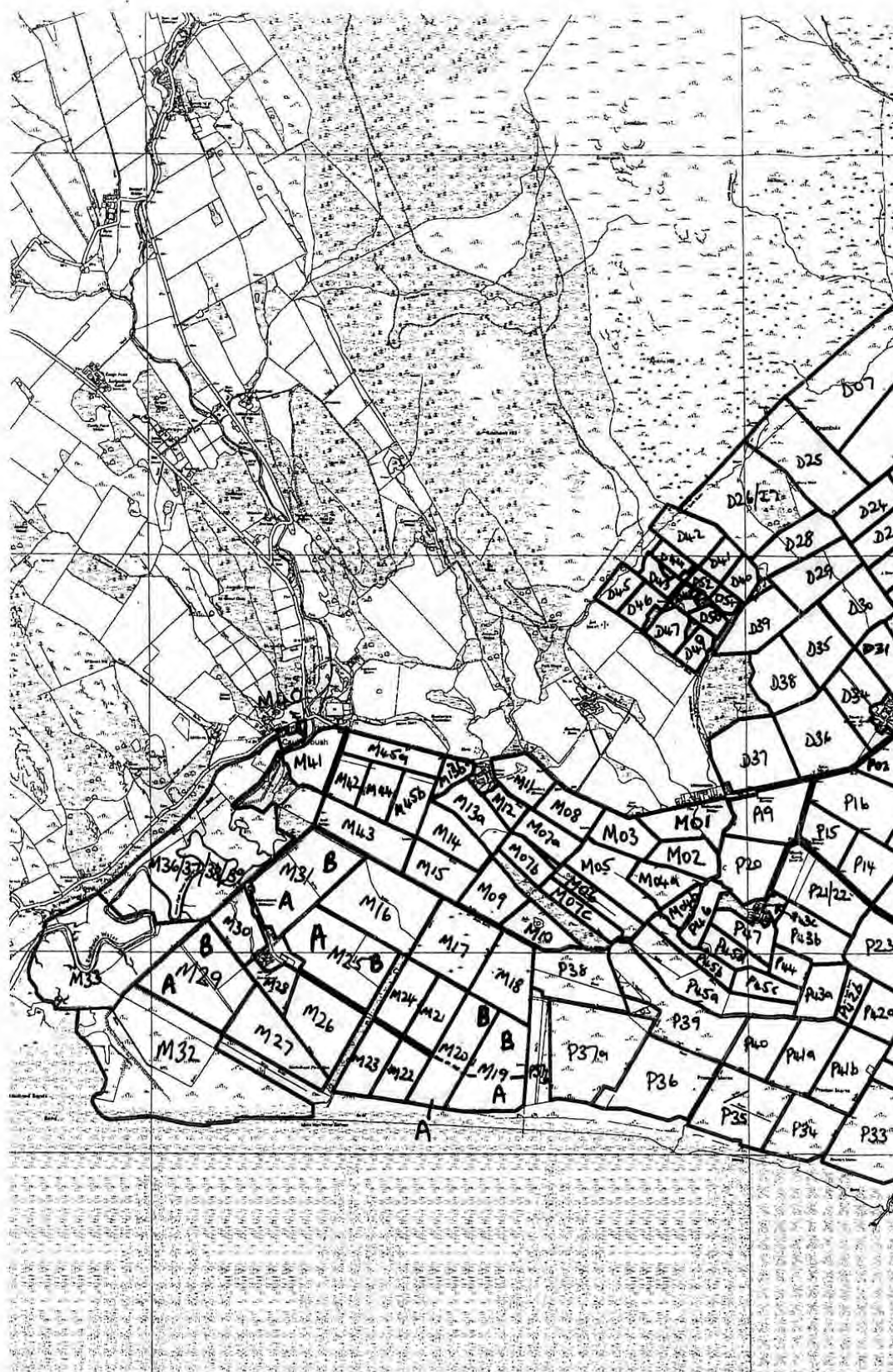


Figure 9. Field codes for the West Preston/Cowcourse/Mersehead area of the Goose Management Scheme.

13

3 Results

3.1 Barnacle Goose counts within the Management Scheme area

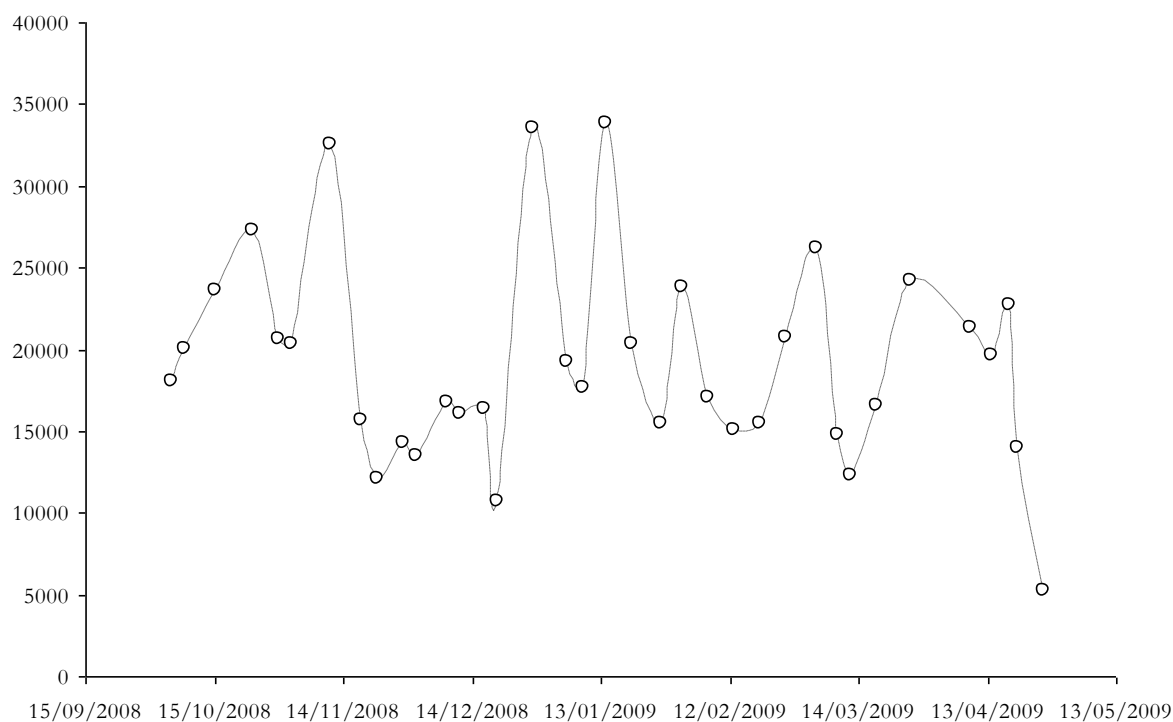


Figure 11. Svalbard Barnacle Goose route count totals within the Management Scheme area.

Some totals are greater than those recorded during coordinated census counts of the Solway population 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 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 counts was 19,100 ranging from a minimum of 5,223 at the end of the season on 26 April 2009 at a time when many of the geese have departed to Norway or are staging on Rockcliffe Marsh in Cumbria prior to departure up to a maximum of 33,856. Overall within the Scheme area there tends to be a decline in goose use as food resources within the area are depleted.

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

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
A21																			
C1					1400						30			40		110	180	40	710
C10	2980						640	580	100							1220			
C12	420			1250						290				680					590
C13	890			490										440		1220			700
C14a	760			500															
C14b				1650															220
C15		2020	480	2400			740						2310	120					
C16			30	780		730		310			20		1320		200		310		
C19a	340		230					22	300										
C19b/c					850	640		570	950	200			490		450		100		140
C2		340																	
C20			280			40		60	460		20	290	50				20		140
C21				630	600	560		2	220					5			630	50	
C23a	2100									50				200			1580		
C23b	1750																90		
C25/26				660													60		
C27				3020			890												
C28	1150					90	1100							1110	260				
C29				1500		70	1000							180					
C3							2820	690						50	4	3200		570	230
C30		3200		1150				90	250					10					
C33								405						70					
C35																			
C37		160															4		25
C39		620					50												
C4/5								820		50	750	500		60	70	2770		340	
C40					150														
C41/43																			
C51	560											110	250		440		210		
C52a		200							100	380		390				180	320	600	100
C52b		75	540				410					100			250		910		
C52c								20		1000									30
C6	25								20										
C7					800			250									60	220	
C8								37	30	50		230					96		20
C9						1660		2	1130	400				190	620	330		1290	
Drumburn Mense																600			
H4/33		1365																	
JP16																		930	
JP18																			
KM1				2500			620	4200	10						2010				
KM10																			
KM13																			
KM17																			
KM18																			
KM2									1160										
KM3											10		1460				420		
KM31																			
KM32																			
KM4					1750	1680	250						540						
KM42																			
KM43				1950															
KM47																	1200		
KM48																			
KM49												1080		1060			3300		
KM50																			
KM51																680			
KM52																			
KM53												1350							
KM54																			
KM6				1250				620									4000		
KM9																			
L09																			
L14/15																			
L25/28																			
L24/29																			
L26/27																			
L30													680	250					
L31															6				390
L36						1800						830					380		
L37																			
L38																			
L43												700							850
M1												250							
M11																			
M12															10				
M13a																			
M15														310		1120			
M16	1240						170	200							20	30			
M19a																			
M19b				1560	160							110							
M2	55																		
M20a				190													140		
M20b		1650		800	120	600											480		
M21																			
M22			900																60
M23			560	15		45						60							
M24								90											
M25															50				
M25a							30	190	10								310		
M25b							220									30			
M26			650	60			130					600		10	120	30		220	120
M27		1810	580	160	1650	95	940	270	30			750			350		290		
M28																			80
M29a								1000							670		360		2500
M29b			100			50			100						30		100	810	
M3						1750						550						80	
M30			1380			120		220					40						
M31a						2230			350	120			90	130		275			
M31b					390	1040	660						550	750	50				
M32						680		80				80						270	
M33											480		380		60				
M36/37/38/39								220		1260				950	200	230		290	40
M4a																			
M42																			
M43				470								70		160	230	230			
M44																			
M45a																	6		
M45b																1250			
M48																			
M4a									1000			20							560
M4b																			
M5																			
M7a																			
M7b									180										
st Preston mudbank	2300	2000	550																

Table 2. Continued

20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total		
	10	10															20	A21	
70	20	190		10	30		480	110									3200	C1	
380	50			230	1		1730		2300								10051	C10	
	460				2280				1190								8410	C12	
10					140					400	2500	710		870			8300	C13	
						320								810			2020	C14a	
						1880				1060				430			4810	C14b	
	20	1800					3670	2390							630	1450	18030	C15	
		20	740				70		60								4590	C16	
																	892	C19a	
70	150	930				730						30	260				6560	C19b/c	
					1100		1400	490									3330	C2	
230					310		470	100	280	10	70						2830	C20	
270	20			180													3167	C21	
140																	4070	C23a	
																	1840	C23b	
			20										80				820	C25/26	
	130										650		430				6490	C27	
30																	2550	C28	
																	2580	C29	
30		30															7624	C3	
1600			80				300	290			2100			2130			11200	C30	
																	475	C33	
5																	5	C35	
1	2																192	C37	
																	670	C39	
				110				200			50		1270				6990	C4/5	
																	150	C40	
250																	250	C41/43	
190	820											90				920	3590	C51	
740		30		20			170				200						3430	C52a	
	10			1090						150		980					4515	C52b	
																	1050	C52c	
																3	48	C6	
60				370									520				2280	C7	
110	90	30							20						150	540	1403	C8	
	1010	1500			50	1380						220					9782	C9	
										2			650	500	380	20	2152	Drumburn Merse	
																	1365	H4/33	
200						750											1880	JP16	
											20						20	JP18	
				220			2510		2500	2200		960		2600			20330	KM11	
2000					10												2010	KM10	
											150						150	KM13	
600																	600	KM17	
	90																90	KM18	
						510				2900			520		1960		7050	KM2	
																	1890	KM3	
		4200															4200	KM31	
		300															300	KM32	
																	5950	KM4	
							2510	1200				250	280				2510	KM42	
																	1950	KM43	
																	1200	KM47	
						2180											2180	KM48	
					2030												7470	KM49	
					1020												1020	KM50	
																	680	KM51	
								1300									1300	KM52	
																	1350	KM53	
					1800												1800	KM54	
		120				150	30										6170	KM6	
250								1000			330		1520				3100	KM9	
						180											180	L09	
							400										400	L14/15	
														800			800	L25/28	
														650			650	L24/29	
														430			430	L26/27	
																	930	L30	
1700																	2096	L31	
																	2630	L36	
1700																	2080	L37	
																	1920	L38	
																	1550	L43	
800		1520									20				250		2840	M1	
																	10	M11	
				1050													1050	M12	
											60						60	M13a	
											180		120				1730	M15	
110							1440				15			280			3505	M16	
						1080	2810			1200							5090	M19a	
												40				840	2710	M19b	
											550					340	945	M2	
																	2250	M20a	
50	500			1220			200										3700	M20b	
																	70	M21	
																	20	M22	
																	1050	M22	
											20						960	M23	
																	165	M24	
											40						50	M25	
250		230	510		2					100	50			370	890	15	2957	M25a	
																	1550	M25b	
130	70	90					1280		230		350						2810	M26	
									180		360						11215	M27	
				1760			1430	560									540	M28	
				460															
				1340	1400												7650	M29a	
60		130		50		590							440			510	2970	M29b	
																	3480	M3	
								1100									1810	M30	
30		120															3370	M31a	
																	5010	M31b	
																	20	M32	
																	4310	M33	
																	2120		

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.

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

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
A1								175						20					
A2																			
A21																			
C8																			
C9																			
C10/11	10																		
C12	350																		
C13	40																		
C17																			
C23a																			
C30																			
C33								80	110				40						
C37		60													1				
C39		60																	
C42																			85
C52b				150															
H4/33		335																	
JP1																			800
JP2																			
JP18																			
JP26																			
JP28																			
KM1																			
KM2																			
KM3																			
KM4							3												
KM6																			
KM13																			
KM4																			
KM9																			
KM10																			
KM43				250															
JP2																			
JP9																			
L9																			
L14/15																			280
L16																			
C37																			
C40																			
M2	395																		
M16	15	400		40		190	240												
M20b				250	200	140													
M32																			
N2		630																	
N10																			
N12																			
N13																			
N14																			
N21																			
N24																			
N38							280							330					
N39												90		650	130		42		
N40																			
N43																			
N44																			
P9/12																			
P10																10			
P35							20												
P41b			20																
PR29																			
PR37/38																			
PR39																			
PR47																			
PR48a																			
PR51																			
PR54																			
PR57																			
PR58																			
PR61																			
PR68a																			
PR68b																			
PR69																			270
PR75																			
PR76												5							
PR78																			
SC5																			
SC6																			
SC47																			900
S18b/24																			
S39											20						15		
S44/46																			
S45/47																			
S50a																			
S54/55																			
S59															10				
S61																			2
S68	6																		
W03/04																			
Drum Bay																			
Nith Estuary			520		130														
Park Farm																			
Total	816	1485	540	690	330	330	543	255	110	0	20	95	40	1000	141	10	57	0	2337

Table 3. Continued.

20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total	
										140							195	A1
				200													140	A2
																	200	A21
													1				1	C8
		4															4	C9
					25												35	C10/11
					10												360	C12
					12												52	C13
							1	1	1								3	C17
																90	90	C23a
														40			40	C30
																	230	C33
																	61	C37
																	60	C39
																	85	C42
																10	160	C52b
																	335	H4/33
					100												900	JP1
				570	1050												1620	JP2
							1000	200			140	150	25				1515	JP18
							1000					160					1160	JP26
											800						800	JP28
				20			50	160	900	600		170		50			1950	KM1
						10				100					110		220	KM2
														50			50	KM3
														400			403	KM4
							60										60	KM6
											300						300	KM13
												50					50	KM4
											95						95	KM9
						10											10	KM10
																	250	KM43
							360										360	JP2
						160											160	JP9
		20				890											910	L9
							600										880	L14/15
	10							500									500	L16
									1140								10	C37
																	1140	C40
																	395	M2
														40			925	M16
																	590	M20b
				1													1	M32
																	630	N2
										260				250			510	N10
	200															290	490	N12
		510												100			610	N13
														630			630	N14
								350									350	N21
								130									130	N24
																	610	N38
	510		500	580	1700	180	800		50	320	15	220					5787	N39
							120										120	N40
							130										130	N43
							510										510	N44
15																	15	P9/12
																	10	P10
																	20	P35
																	20	P41b
													45				45	PR29
										350							350	PR37/38
													700				700	PR39
								190									190	PR47
40																	40	PR48a
																	650	PR51
						60							650				60	PR54
										60							60	PR57
					50				100								150	PR58
									310								310	PR61
		10								30							40	PR68a
							840										840	PR68b
																	270	PR69
		40															40	PR75
																	5	PR76
					60												60	PR78
								20									20	SC5
														20			20	SC6
																	900	SC47
	1																1	S18b/24
						70									30		135	S39
						130											130	S44/46
							500										500	S45/47
																	200	S50a
			10				160			90	80		100				440	S54/55
																	10	S59
																	2	S61
																	6	S68
			50														50	W03/04
										50		65	1500	100	640	300	2655	Drum Bay
																	650	Nith Estuary
								1000									1000	Park Farm
15	761	584	560	1371	3007	2510	5331	3691	1511	1930	1350	1565	2271	1710	750	690		Total

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 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.

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
C8	10																		
C12	310				14			18	16					10	10				4
C17	4	10	2	4				15	2		18			4					
C28	25																		
C33								35											
C37		8																	
C52b		70				18													
M16	14					30													
PR75							1	1		1									
S68																			
Total	363	88	2	4	14	48	1	69	18	1	18	0	0	14	10	0	0	0	4

20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total	
																	10	C8
																	310	C12
				6	14	4	2										72	C16
																	85	C17
																	25	C28
																	35	C33
																	8	C37
																	88	C52b
																	44	M16
																	1	PR75
																	2	S68
0	0	0	6	14	4	2	0	0	0	0	0	0	0	0	0	0		Total

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 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.

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
C8	2	50																	35
C10		5	104																
C12	280																		
C17	1	55		105	80	9	1	130			6	1			2	15	10	36	
C28	6																		
C51		20																	
M16	60						90	118											
M25b							6	12	10							10			
M27															12				
M30								33											
M31											170								
M32																			
M43				60															
P34																57			
P35					6	20	10												
SC16	18	16					68												
S33				75															
S33a																			
S54/55		105													110				
S60/64	9																		
Total	376	251	104	240	86	29	175	293	10	0	176	1	0	60	181	25	10	36	35

20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total	
	2													1			90	C8
																	109	C10
																	280	C12
65	60	76	15	16	27	9	4	9	10	10	2	3					757	C17
																	6	C28
																	20	C51
												4					272	M16
																	38	M25b
																	12	M27
																	33	M30
																	170	M31
																	2	M32
																	60	M43
53																	110	P34
																	36	P35
																	102	SC16
																	135	S33
																	110	S33a
																	105	S54/55
																	9	S60/64
118	62	76	15	16	27	9	4	9	10	10	8	3	1	0	0	0		Total

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 around 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.

Table 5 Whooper Swan flock sizes recorded during the Management Scheme route counts.

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
A1								320						5					
C8	8			1	1		10			36	11	1						11	4
C10							2												
C17	2	7		5	2	1	1	1		102	30	50	25	10	10	140	50	60	75
C27																8			
C29							2								1				
C30																			
C33							65	5	100	60		57	20	240	38				15
C37														93	116	6			50
C40																			
C41																9			
KM12																			
KM24													30						
KM35													50			60			
KM40														37					
KM49																			28
KM50						25													
L9																130	60		
L10																			
M16																			
M20b					2														
PR29								3											
PR18										70									
PR36															5				
PR75				164	228	250				150						70			
PR76									38	5		130							
PR68b											40								
PR72								130											
SC16	12	49	70																
SC28																			
SC29																	64		
SC33														10					
SC44																			
SC46														50					
S33a															1				
S56/57											122								
S39															5				
S61													160	40	50	110		50	232
S62																	5		
Conheath																			
Thwaite																			
Total	22	56	70	170	233	276	80	459	138	423	203	238	285	485	226	533	179	121	404

27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total	
21	57			35				116	55			1				325	A1
																370	C8
																2	C10
88	45	60	90	95	95	100	75	24	140	60	25	12	5	5	5	1510	C17
																8	C27
																3	C29
80																80	C30
																625	C33
1																331	C37
27																27	C40
																9	C41
		4														4	KM12
																30	KM24
																110	KM35
																37	KM40
																28	KM49
																25	KM50
																190	L9
												4				4	L10
								19		1						20	M16
																2	M20b
																3	PR29
																70	PR18
																5	PR36
																862	PR75
																173	PR76
																40	PR68b
																130	PR72
								167	89							131	SC16
																256	SC28
																64	SC29
																10	SC33
								17								17	SC44
																50	SC46
																1	S33a
																122	S56/57
																5	S39
77																916	S61
																5	S62
									35	40						75	Conheath
									100	110						210	Thwaite
294	102	64	90	130	95	100	242	265	330	211	25	17	5	5	5		Total

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

	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09	14/01/09
C8	4		4	4	2	2	2	6											
C10				4			3												
C16										1									
C17		8	4	4	7	5		4		3	13	25	15	5	22	40	20	60	44
C30																			
C51							7												
C52b	10	6			8	10													
M16	1	1	1	1			2								1	5			
M25								2											
M30								2		1					2				
P44		4						2		2									
PR57																			
S33				2	2									20					
S33a															17				
S39																			
S71				2	6	10	3												
SC06							4	17	25										
SC45			8	2															
Total	15	19	17	19	25	27	21	31	25	7	13	25	15	25	42	45	20	60	44

	20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09	Total	
										9								33	C8
														2		1	1	11	C10
60	32	45	60	90	95	95	100	75	24	30	55	60	50	2	2	2	2	9	C16
2														50	40	40	35	1265	C17
																		2	C30
											10							44	C52b
													2		2		1	19	M16
																		3	M25
																		6	M30
																		4	P44
										2								2	PR57
																		24	S33
																		17	S33a
															1			1	S39
																		21	S71
																		46	SC06
										2								12	SC45
62	32	45	60	90	95	95	100	75	35	42	55	62	54	45	45	39		Total	

3.7 Deliberate disturbance to geese in the Management Scheme area

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

- From 18 March onwards, gas guns were present in fields KM10 and KM13 although these scaring devices were probably mainly in place to deter feeding Pink-footed Geese in that area;
- From 26 March onwards, canes with coloured tapes were noted in fields SC25 and SC30;
- On 20 April a tractor was driven at speed towards feeding geese on field M1, pushing them off of that field;
- On 26 April a quad was driven at speed towards feeding geese on field M2, pushing them off of that field.

3.8 Count section dates and times of coverage

Table 6. Survey dates and times for the Management Scheme route count sections.

	Sunday	Wednesday	Wednesday	Friday	Thursday	Sunday	Tuesday	Tuesday	Saturday	Friday	Monday	Monday	Thursday	Wednesday	Saturday	Sunday	Monday	Friday
	05/10/08	08/10/08	15/10/08	24/10/08	30/10/08	02/11/08	11/11/08	18/11/08	22/11/08	28/11/08	01/12/08	08/12/08	11/12/08	17/12/08	20/12/08	28/12/08	05/01/09	09/01/09
Thwaite	08:00	08:00	10:00	08:30	16:00	15:00	14:30	09:00	09:00	09:00	15:00	09:00	14:30	09:00	09:00	15:30	09:00	15:00
Nith	10:30	08:00	08:00	08:00	14:00	13:00	12:30	09:00	13:00	13:00	13:00	13:00	13:00	12:00	12:00	15:00	12:00	13:00
Southernness	15:30	17:00	10:00	14:00	11:30	10:00	15:00	13:10	13:30	14:30	10:30	14:00	11:00	13:00	13:00	14:00	13:00	11:00
Colvend	17:00	18:30	10:00	16:00	08:30	09:00	16:15	16:00	15:30	15:30	10:00	15:00	09:30	14:00	14:30	12:00	15:00	10:00

	Wednesday	Tuesday	Tuesday	Sunday	Saturday	Friday	Thursday	Wednesday	Wednesday	Monday	Thursday	Wednesday	Thursday	Thursday	Tuesday	Saturday	Monday	Sunday
	14/01/09	20/01/09	27/01/09	01/02/09	07/02/09	13/02/09	19/02/09	25/02/09	04/03/09	09/03/09	12/03/09	18/03/09	26/03/09	09/04/09	14/04/09	18/04/09	20/04/09	26/04/09
	10:00	15:00	10:00	15:30	09:30	09:30	16:00	10:00	09:00	17:00	17:00	11:00	08:00	15:00	09:00	15:00	16:00	12:00
	09:00	13:00	12:00	13:00	11:30	11:30	14:00	12:00	10:00	14:00	14:00	08:00	10:00	12:00	08:00	11:00	11:00	11:00
	13:30	11:00	14:00	11:00	14:00	14:00	11:00	15:00	14:00	09:00	10:00	10:00	14:00	10:00	17:00	10:00	08:00	08:30
	15:00	10:00	15:00	10:00	15:30	16:00	10:00	16:30	16:00	08:00	09:00	10:00	16:00	08:00	18:00	09:00	09:30	09:00

In summary, these dates represent coverage on five Mondays, five Tuesdays, seven Wednesdays, six Thursdays, four Fridays, four Saturdays and five Sundays, giving 36 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. Generally as might be expected it was farmers in fringe areas or with fields not receiving payments that were most concerned to log their observations of goose flocks. In areas less frequented by the geese, the common problem is that count dates and times do not necessarily coincide with when the geese are present, an unavoidable artefact of the methodology.

Table 7. Records of conversations with farmers regarding goose activity inside and outside the Scheme area.

05/10/08 Alastair Wylie
 08/10/08
 15/10/08
 24/10/08
 30/10/08 Son at Glenstocken
 02/11/08 Stephen Roan at Boreland of Colvend
 11/11/08
 18/11/08
 22/11/08 Steven Murray at West Preston Farm
 01/12/08 Spoke to worker at Boreland Farm about geese
 08/12/08 Stephen Roan, Boreland of Colvend, observed >1,000 barnacle geese in his fields in last week
 11/12/08
 17/12/08 Phone conversation with Alastair Martin about geese at Nether Locharwoods
 20/12/08
 28/12/08 Steven Roan
 05/01/09 Spoke with Stephen and Stewart Brown at Newfield
 09/01/09 Jake at Green Merse Farm, he said no geese at farm that morning
 14/01/09
 20/01/09
 27/01/09 Stephen and Stewart Brown
 01/02/09 Jack Graham on 30/01/09
 07/02/09
 13/02/09
 19/02/09 Jake at Green Merse expressed desire to know more about the goose scheme
 25/02/09 Conversation with farm worker about geese
 04/03/09 Jamie Blackett (Arbigland Farm) observed 1,000+ Pink-footed geese at JP18 this week feeding on wheat seedlings, not present today due to chemical spraying
 09/03/09
 12/03/09
 18/03/09
 26/03/09
 09/04/09
 14/04/09
 18/04/09 Steven Murray at West Preston Farm
 20/04/09 Steven Roan at Boreland of Colvend
 26/04/09

3.10 Coordinated Svalbard Barnacle Goose population count totals

Table 8. Coordinated Svalbard Barnacle Goose population count totals for the Solway 2008-2009.

Count section	01/10/2008	08/10/2008	15/10/2008	22/10/2008	29/10/2008	18/11/2008	19/12/2008	14/01/2009	03/02/2009	18/03/2009	08/04/2009	15/04/2009	22/04/2009	29/04/2009	06/05/2009	13/05/2009
Annan to Gretna	0	0	nc	nc	nc	nc	nc	0	nc	nc	nc	nc	0	0	0	0
Ruthwell to Cummertrees	0	0	0	0	0	0	140	1105	0	5800	245	10	0	0	0	0
Longbridgemuir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caerlaverock	3290	10760	9021	10380	10930	4238	4950	14870	2560	2970	8650	5270	3540	10	0	0
Kirkconnell & Ward Law	0	3455	4720	2220	2000	5070	3310	0	4550	5100	1210	3120	20	0	0	0
Mersehead to Airds Pt	107	6180	10070	9250	9040	6770	5790	6230	3630	6622	7040	7655	6600	1470	0	0
Caulkerbush to Rascarrel	0	0	0	0	950	0	0	nc	1330	0	0	0	0	0	0	0
Dundrennan MOD	0	0	0	0	75	220	0	0	0	3200	1500	2060	790	0	0	0
Rockcliffe Marsh	1170	2620	6200	4060	6010	4245	1020	5220	1320	10520	3110	5635	9390	6550	8020	9500
Burgh Marsh	0	0	60	165	0	nc	1900	130	0	0	2400	3925	300	340	0	0
Bowness to Grune	0	7	1040	0	1300	1400	1100	2100	1340	1550	614	1745	1100	303	0	0
Total	4567	23022	31111	26075	30305	22083	19175	28550	20530	30207	24534	29410	21740	8673	8020	9500
Notes			1		2	3	4	5	6							7

Notes:

1 Visibility poor for Bob Jones' estimate of 3,750 off western end of Rockcliffe Marsh; total count includes four flock counts where 3,500 or more birds present. Potential for double counting between the 4,720 at Lantonside mud at 08:20 and 5,090 at GM etc at 09:00? LRG ill, BRM had to cover whole route.

2 Estimate of 2,000 on new merse from Lantonside to Castle Corner.

3 Peter Williams counted Auchencairn section on 19/11/08.

4 Dave Fairlamb counted Mersehead section on 18/12/08. David and Hilary Hawker counted Auchencairn to Kirkcudbright but very bad count conditions. Marian and Dave Rochester counted Mucraig to Wigtown but no geese.

5 Marian and Dave Rochester counted Muncraig to Whithorn but no geese. Farmer at Baurch said there had been no geese all winter. David and Hilary Hawker abandoned count at Auchencairn due to fog and visibility of less than 100m.

6 Dave Blackledge counted Bowness and Burgh sections on 04/02/09. Bob Jones had access problems on 03/02/09. David and Hilary Hawker had 0 in good weather from Kirkcudbright to Auchencairn though no access to Wall Hill MOD. Marian and Dave Rochester had 0 geese in Muncraig section.

7 Bob Jones had zero on his western section of Rockcliffe Marsh.

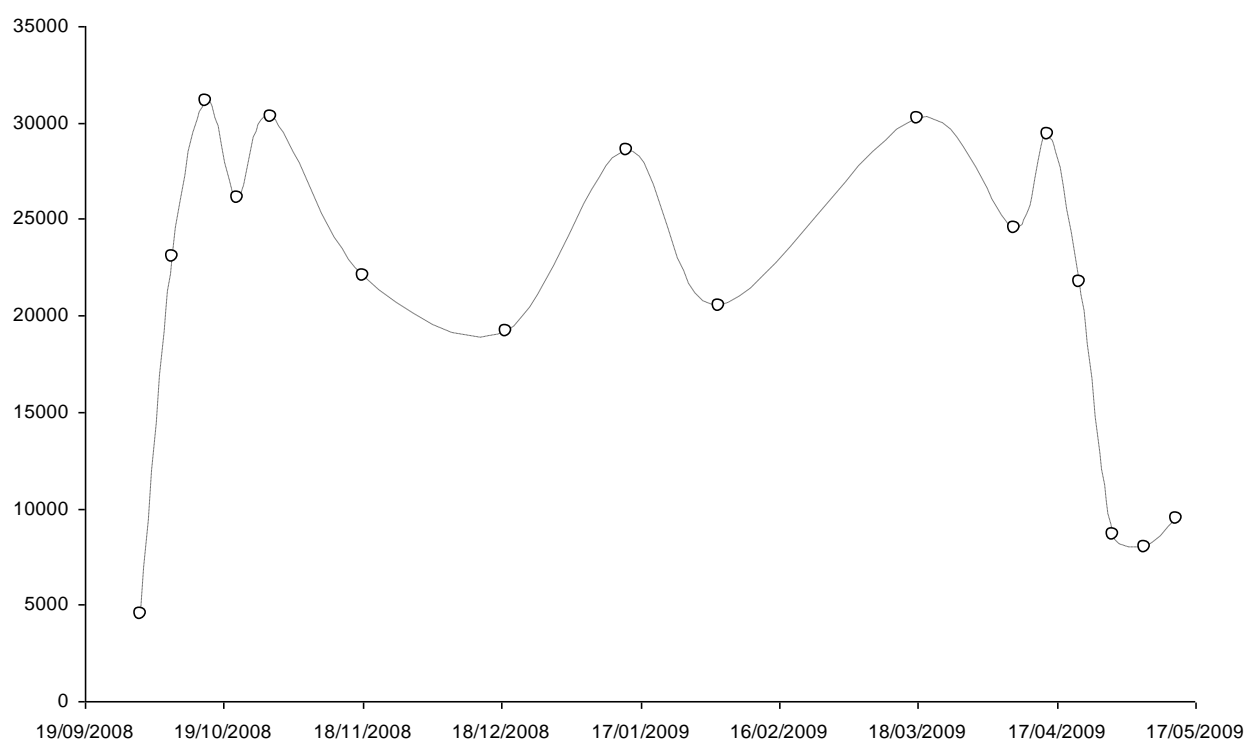


Figure 12. The total population of Svalbard Barnacle Geese recorded on the Inner Solway from October 2008 to May 2009.

Total population counts of Svalbard Barnacle Geese rose rapidly on the Inner Solway from 4,567 on 1 October 2008 to 23,022 one week later (Table 8; 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 possibly inaccuracies and increased chances of double-counting for the reasons outlined in the 'Notes' above, an adopted count total for the population is usually derived by averaging those counts within 10% of the maximum recorded during the winter. In 2008-2009 counts on 15 October, 29 October, 14 January, 18 March and 15 April of 31,111 (the maximum count recorded), 30,305, 28,550, 30,207 and 29,410 respectively, fulfil this criterion and are thus averaged to produce **an adopted population total of 29,900 Barnacle Geese** (rounded down to the nearest 100).

3.11 Brood size and juvenile productivity of the Svalbard Barnacle Goose

Table 9. Brood size and juvenile productivity for Svalbard Barnacle Geese on the Solway 2008-2009.

Date	Flock Size	Sample Size	Total Juvs	Field	Brood of 1	Brood of 2	Brood of 3	Brood of 4	Brood of 5	Brood of 6	Single Juvs	% juvs	Obs
02/10/2008	1020	1020	59	O7	9	13	4	3				5.8	LRG
22/10/2008	1250	1250	135	KM6								10.8	LRG
27/10/2008	1250	1210	82	E13								6.8	LRG
28/10/2008	1500	1480	173	E13	6	8	4					11.7	LRG
31/10/2008	2000			O5	7	11	6						LRG
02/11/2008	1040	680	50	PR75	4	9	5	1				7.4	LRG
03/11/2008	1000	930	78	R4	7	6	3					8.4	LRG
05/11/2008	220	220	8	O2	3	1	1					3.6	LRG
06/11/2008	420	420	7	A6	3			1				1.7	LRG
12/11/2008	600			O5	1	1							LRG
12/11/2008	5550	470	59	V4								12.6	LRG
18/11/2008	620	620	72	KM6		7	1	2				11.6	LRG
25/11/2008	217	217	9	O8	2	2	1					4.1	LRG
26/11/2008	540	540	48	UM	4	13	6					8.9	LRG
11/12/2008	900	900	76	P2								8.4	LRG
26/12/2008	230	129	13	S1	2	4	1					10.1	LRG
15/01/2009	300	214	29	R4b								13.6	LRG
Total		10300	898										
Overall juv%					8.7	Brood size totals:							
					48	75	32	7	0	0	Total broods	162	
					Number of juveniles per brood size category:						Max %juvs	13.6	
					48	150	96	28	0	0	Total juvs	322	
											Mean brood	1.99	

The juvenile productivity of the Svalbard Barnacle Goose observed in flocks sampled on the Inner Solway from October 2008 to January 2009 from Priestshead in the east to Mersehead in the west ranged from 1.7% to 13.6% with a mean of 8.7% young ($n = 15$ flocks; 10,300 geese sampled). Across the same area, the total number of broods sampled was 162, with a mean family size of 2.0 young being recorded per family (range 1-4 young).

3.12 Leucistic Barnacle Geese

A maximum of four leucistic Barnacle Geese were recorded on four separate occasions; twice during a coordinated population count and twice during a route count with no double counting. White birds were recorded on almost all counts and distributed themselves across all count sections on both sides of the Solway through the course of the winter.

3.13 Other geese

Other geese of note recorded during the counts included Light-bellied Brent Geese (at least one adult and one juvenile), an adult Dark-bellied Brent Goose, and at least two Cackling Canada Geese and a Taverner's Canada Goose, all appeared to be of wild origin, one of the Cackling Canada Geese arriving with the first Barnacle Goose migrants, probably being the one recorded with them on migration past Norway. A Richardson's Canada Goose was also reported on the Solway this winter.