CHAPTER 4 - CONCLUSIONS

The results of the study not only confirmed that Islay receives internationally important numbers of Greenland White-fronted Geese, with some 30%-40% of the world's population wintering on the island in recent years, but also showed that certain parts of the island are particularly important for the geese. Analysis of the distribution of the birds from 1988-89 to 1992-93 inclusive, for instance, found that the highest proportion of the geese wintering on Islay each season were recorded in the Kilmeny count area; a comparatively small number of goose sites and of birds were found in the Glen and Ardtalla count areas (see Section 3.1.1). Moreover, the same 1 km squares within the main count areas proved consistently important for the geese over several years, emphasising the need to protect these traditional sites for the continued welfare of the species. Site fidelity was confirmed not only by the tendency for birds to concentrate in certain parts of the island from year to year, but also by the tendency for the same individuals to return to the same farms; of 122 geese sighted on Islay for at least two seasons, 80.3% were recorded at the same farm each year. The effect that the destruction of a traditional wintering site has upon the subsequent dispersal and survival of individuals from that region is a question which hopefully will not need to be tested in future, particularly since earlier studies indicate that loss of habitat is associated with a decrease in the size of the population. (Ruttledge & Ogilvie 1979; Stroud 1992).

Analysis of the movements of marked birds indicates that the home ranges of individual geese are limited, varying from 42 to 1444 hectares for individuals monitored during the 1991-92 and 1992-93 winters. The individual birds also made very patchy use of their home range, using only a small number of fields and thus apparently being highly selective in their choice of feeding sites (Section 3.1.4). The marked day-to-day variation in the numbers of birds using the three experimental fields (Section 3.2), and also variation between years in the relative importance of particular fields for the birds (Table 3.1.4.2), however, suggests that the conservation of Greenland White-fronted Geese on Islay should be considered in terms of protecting "catchment areas" supporting different flocks or sub-populations to allow for movements between fields. Some 20 such catchment areas, identified by monitoring the movements of flocks between feeding sites and roost sites in the 1991-92 winter, are illustrated in Section 3.4, including areas where the feeding sites of birds using different roosts appear to overlap. Over 80 roosts or roost complexes were recorded, including 16 that received at least 300 birds (Section 3.4), thus qualifying as sites of international importance for the species and therefore suitable for designation as Wetlands of International Importance under the Ramsar Convention. Only four of these roosts (Gruinart Flats, Duich Moss, Glac-na-Crich and Feur Lochain) are currently designated as Ramsar sites, and the designation does not extend to the birds' day-time feeding areas. The possibility of extending Ramsar status to other roost sites, and also to feeding sites, should be explored. Moreover, although the

importance of traditional wintering sites on Islay may be recognised at an international level, national legislation is the means by which efforts to conserve birds and their habitats are implemented. Many areas used by the geese on Islay have already been designated as Sites of Special Scientific Interest under the Wildlife and Countryside Act (1981), but the number and distribution of SSSIs may should be reconsidered, and legal protection at an international level introduced by designating sites as Special Protection Areas (SPAs) under the EEC Birds Directive (see Section 1.2).

An assessment of the distribution of geese in the main study area during the 1992-93 winter found that habitat variables did appear to influence the birds' selection of feeding sites; they occurred more frequently and in greater numbers in fields with comparatively high abundance of Juncus and those with greener swards. They also occurred in greater numbers in fields with longer swards, and the tendency for the geese to disperse into smaller flocks over a larger number of fields as the winter progressed was attributed to the reduction in the food supply. A further more detailed investigation of the effect that different land management practices had upon the distribution of the birds proved inconclusive. There was no evidence to suggest that liming and fertilising pasture, or the cutting of Juncus stands, had a major effect upon the distribution of geese across the treated fields, although there was some tentative evidence for a positive association between goose numbers and the biomass of vegetation recorded in the different plots. There was also no evidence for an association between the different treatments and variation in a range of habitat variables measured during the winter however (including the biomass of vegetation, sward length and the abundance of different types of vegetation), suggesting either that the methods used to measure the habitat variables were too crude to identify any differences between the experimental plots, or that the treatments had only a limited effect on the vegetation within a single season. It is also possible that the birds select a field on the basis of its "condition" (colour, sward length, topography etc) as viewed from the air, but that the distribution of birds upon landing may be influenced by other factors including social relationships within the flock.

A more detailed study of the association between different types of farming practice, habitat variables and goose distribution over a longer period (at least three winters) therefore is needed to clarify this issue. The question of whether birds move from un-treated plots in mid-winter to more intensively managed pasture later in the season (tentatively indicated in section 3.2, and also by Norriss & Wilson 1993) should also be investigated in further detail. Analysis of the distribution of birds in relation to habitat, based on observations made during the all-island counts (ie at feeding sites) indicated that over 80% of the birds seen in autumn and 90% of those seen in spring were recorded on pasture, including 15.8% on rough pasture in autumn and 12.3% on rough pasture in spring. Arable land was used more intensively in autumn than in spring (which also agrees with the findings of Norriss & Wilson 1993), perhaps reflecting differences in food availability at these times, or variation in the nutrient

requirement of the birds during the winter. An investigation of the food ingested by the birds, determined by faecal analysis, showed that the birds fed selectively on different types of vegetation at different sites, but that Anthoxanthum odoratum, Festuca rubra, Alopecurus geniculatus, and Trifolium repens appear to form a major part of the diet. There was a positive correlation between the number of Greenland white-fronted Geese and the number of Barnacle Geese present at a site (field AO35 on the RSPB reserve), and an inverse correlation between the numbers of Greenland White-fronted Geese counted with the number of cattle present on the same day.

Although the study has reviewed the past and present status of the geese on Islay, it is important that monitoring and research programmes continue and develop with a view to identifying any change in the status or ecological requirements of the birds. The introduction of the goose management scheme on Islay may have a major effect upon the distribution of the geese, for instance, since farmers will be less likely to deter the birds from feeding on their land. Norriss and Wilson (1993) show that patterns of site use are influenced by disturbance factors, but disturbance levels have not yet been investigated in relation to the Islay-wintering population. In addition to making a more detailed study of the feeding ecology of the species, and assessing the effect of the goose management scheme upon the Islay-wintering population, the study identifies other areas that need further research. The uneven distribution of family parties on Islay, with certain sites tending to have a higher percentage of juveniles over several winters than other areas, for instance, should be considered in further detail to determine the biological reasons underlying the variation in reproductive success. Possible reasons for this variation include differences in the food supply and condition of the birds in winter, which could be identified by further research into the feeding ecology of the geese at different sites, or to sub-populations on Islay remaining in discrete groups and nesting under differing conditions in the breeding range, which could be addressed by ringing birds on different parts of Islay and relocating these individuals at their icelandic nest sites. Finally, the continued association between parents and their offspring, which persists for much longer periods in Greenland White-fronted Geese than in other goose species (Warren 1990), should be explored in terms of the costs and benefits to individuals in the family group in remaining together over several years.

SUMMARY

A summary of the results described within each section is given at the end of the section in question, but some of the main findings of the study are also listed below:

1. The results of the study confirmed that Islay receives internationally important numbers of Greenland White-fronted Geese and showed that certain parts of the island are particularly important for the geese; the highest proportion of the geese wintering on Islay from 1988-89 to 1992-93 inclusive were recorded in the Kilmeny count area. A comparatively small number of goose sites and of birds were found in the Glen and Ardtalla regions.

2. The same sites within the main count areas proved consistently important for the geese over several years, emphasising the need to protect these areas for the continued welfare of the species.

3. There was some evidence for seasonal changes in the distribution of the birds on Islay.

4. Over 80% of the birds counted in autumn and over 90% of those recorded in spring were recorded on pasture; within the pasture categories the birds were evenly distributed over old pasture and recently improved pasture in autumn, but concentrated on recently improved pasture in spring. Arable land was used more in autumn than in spring.

5. There was substantial annual variation in reproductive success, and also an uneven distribution of family parties on Islay within a season. Certain sites tended to have a higher percentage of juveniles each year than others. This consistency in reproductive success was more apparent at the farm level than between count areas. There was no evidence to suggest that families selected particular types of habitat during the winter.

6. Resightings of marked birds indicated that the birds have a high level of winter site fidelity, both within and between seasons, although there was evidence for a shift from one feeding area used in autumn to an adjacent site in mid-winter.

7. An analysis of sightings of ringed birds confirmed that individual geese tend to remain within a very small area during the winter (with home ranges recorded for individual birds varying from 42 to 1444 hectares), and that individuals make very patchy use of their home range.

8. More detailed observations of the distibution of birds in the main study area indicated that the geese concentrate on a small number of fields early in the season but disperse into smaller flocks, using a larger number of fields, as the winter progresses. Sward length decreased as the winter progressed, and the reduction in food supply was thought to be a possible reason for this change

in distibution.

9. The geese in the main study area selected fields with a comparatively high abundance og Juncus, and also those with greener swards, suggesting that they prefer improved (fertilised) pasture. However, different liming and fertilising treatments at three experimental fields during the summer did not appear to affect the distribution of birds within these fields the following winter.

10. The number of years since the field was re-seeded did not have a significant effect on the number of birds using the field.

11. Since the investigation of the effect that different land management practices had upon the distribution of the birds proved inconclusive, a more concentrated study of the distribution of the geese in relation to management techniques and habitat variables is recommended to help to confirm the ecological requirements of Greenland white-fronted Geese, and the best ways of managing the land for the birds.

12. It is suggested that the conservation of Greenland White-fronted Geese on Islay should be considered in terms of protecting "catchment areas" supporting different flocks or sub-populations to allow for localised changes in distribution within and between winters. Some 20 catchment areas were identified by monitoring the movements of flocks between feeding sites and roost sites in the 1991-92 winter, including areas where the feeding sites of birds using different roosts appear to overlap.

13. Over 80 roosts or roost complexes were recorded, including 16 that received at least 300 birds, thus qualifying as sites of international importance for the species and potentially suitable for designation as wetlands of international importance under the Ramsar Convention. Many areas used by the geese on Islay have already been designated as Sites of Special Scientific Interest under the Wildlife and Countryside Act (1981), but the number and distribution of SSSIs may perhaps need to be reconsidered, and legal protection at an international level introduced by designating sites as Special Protection Areas (SPAs) under the EEC Birds Directive.

14. Although the study has reviewed the past and present status of the geese on Islay, it is important that monitoring and research programmes continue and develop with a view to identifying any change in the status or ecological requirements of the birds, and particularly to assess the effect that the Islay Goose Management Plan has upon the distribution of the geese.

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Appendix 1.

Number of geese counted on each 1 km square within each count area, in autumn and spring, from 1988-89 to 1992-93 inclusive. Count dates used in autumn were 6.12.88, 2.12.89, 1.12.90, 1.12.91, 12.12.92. Count dates used in spring were 30.03.89, 10.02.90, 24.03.91, 10.02.92, 09.03.93.

RHINNS

	Autumn			Spring		
Grid	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
1752	-	-	-	2	14.5	5.8
1753	3	107	64.2	1	51	10.2
1754	3	174.7	104.8	5	97.2	97.2
1852	2	87.5	35.0	1	80	16.0
1952	-	-	-	1	37	7.4
2053	2	38.5	15.4	3	40.7	24.4
2060	-	-	-	3	144	86.4
2154	-	-	-	2	170.5	68.2
2255	1	140	28.0	-	-	-
2256	-	-	-	1	232	46.4
2357	1	241	48.2	-	-	-
2457	2	74.5	29.8	3	157.3	94.4
2458	1	98	19.6	1	115	23.0
2558	3	206.7	124.0	3	150.3	90.2
2559	2	58.5	23.4	4	208.3	166.6
2560	1	24	4.8	-	-	-
2561	1	180	36.0	2	102	40.8
2562	2	163	65.2	2	129	51.6
2660	-	-	-	1	54	10.8
2661	2	195.5	78.2	1	20	4.0
2662	2	136.5	54.6	4	148.3	118.6
2762	1	108	21.6	1	15	3.0

ARDTALLA

	Autumn			Spring		
Grid	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
3746	-	-	-	1	12	2.4
3845	3	243	148.8	1	230	46.0
3846	-	-	-	2	293.5	117.4
3945	2	173	69.2	2	227	90.8
3946	1	385	77.0	-	-	-

Appendix 1 (cont.)

GORM

Grid	Autumn			Spring		
	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
1964	2	121.5	48.6	2	348	139.2
2064	4	249.5	199.6	4	236.3	189.0
2065	-	-	-	1	25	5.0
2163	-	-	-	1	224	44.8
2164	2	336.5	134.6	1	101	20.2
2166	-	-	-	1	18	3.6
2263	1	106	21.2	5	447.4	447.4
2266	1	115	23.0	4	171.5	137.2
2267	-	-	-	1	97	19.4
2364	2	215	86.0	1	12	2.4
2367	2	194.5	77.8	1	66	13.2
2368	4	313.5	250.8	3	54.3	32.6
2369	-	-	-	2	32	12.8
2370	2	34.5	13.8	1	8	1.6
2464	2	243	97.2	-	-	-
2467	-	-	-	1	11	2.2
2468	-	-	-	2	24	9.6
2470	1	10	2.0	2	29	11.6
2564	4	241.8	193.4	4	169.5	135.6
2565	-	-	-	1	313	62.6
2664	-	-	-	4	61.3	49.0
2763	2	52.5	21.0	4	46.5	37.2

GLEN

Grid	Autumn			Spring		
	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
3455	-	-	-	3	64.7	38.8
3556	4	206	164.8	4	69.5	55.6
3657	3	63.3	38.0	4	52	41.6
3658	-	-	-	1	184	36.8
3659	3	121.3	72.8	3	217.3	130.4
3758	1	114	22.8	-	-	-
3759	4	124.8	99.8	4	85	68.0
3860	4	173.5	138.8	2	122	48.8
3961	1	117	23.4	-	-	-

Appendix 1 (cont.)

GRUINART

Grid	Autumn			Spring		
	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
2766	4	20.5	16.4	2	30.5	12.2
2767	41	75	75	2	9.5	3.8
2768	3	34.7	20.8	2	23.5	9.4
2769	1	11	2.2	-	-	-
2864	3	19.3	11.6	2	42	16.8
2866	5	82.4	82.4	2	19.5	7.8
2867	3	52	31.2	2	8	3.2
2869	1	93	18.6	1	5	1.0
2870	3	12	7.2	-	-	-
2871	2	20.5	8.2	1	7	3.2
2872	3	61.7	37.0	-	-	-
2873	1	35	7.0	1	6	1.2
2963	3	53.7	32.2	5	69.8	69.8
2964	3	76.7	46.0	3	39.7	23.8
2965	3	148.5	118.8	5	83.8	83.8
2966	5	204.4	204.4	4	54.5	43.6
2967	3	111.7	67.0	3	12	7.2
2969	1	2	0.4	-	-	-
2973	3	21.3	12.8	-	-	-
2974	-	-	-	1	9	1.8
3063	4	121	96.8	3	70.3	42.2
3064	-	-	-	1	107	21.4
3066	1	370	74.0	-	-	-
3071	-	-	-	2	21.5	8.6
3172	1	15	3.0	-	-	-

Appendix 1 (cont.)

OA

Grid	Autumn			Spring		
	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
2741	-	-	-	1	40	8.0
2742	1	80	16.0	1	188	37.6
2743	1	35	7.0	1	20	4.0
2843	2	222.5	89.0	3	92.7	55.6
2844	1	102	20.4	-	-	-
2942	5	334	334.0	5	268.4	268.4
2943	3	52.3	31.4	3	130.7	78.4
3042	-	-	-	1	275	55.0
3143	2	26.5	10.6	4	48.3	38.6
3243	1	114	22.8	-	-	-
3244	1	246	49.2	1	64	12.8
3245	1	12	2.4	-	-	-
3247	3	154.3	92.6	3	111.7	67.0
3248	3	130.7	78.4	2	153.5	61.4
3250	-	-	-	1	22	4.4
3346	4	137.3	109.8	4	314.5	251.6
3347	1	8	1.6	3	112.7	67.6
3348	-	-	-	1	15	3.0
3349	1	97	19.4	4	32.3	25.8
3350	-	-	-	1	18	3.6
3445	1	33	6.6	1	120	24.0
3446	4	343.7	275.0	3	221.3	132.8
3447	1	3	0.6	-	-	-
3448	4	163	130.4	3	154.3	92.6
3449	4	171.5	137.2	4	92.8	74.2
3450	-	-	-	1	72	14.4
3451	-	-	-	1	112	22.4
3546	-	-	-	1	61	12.2
3547	1	77	15.4	-	-	-
3548	2	129	51.6	2	330	132.0
3549	4	108.5	86.8	3	68.3	41.0
3550	1	39	7.8	3	50	30.0

Appendix 1 (cont.)

KILMENY	Autumn			Spring		
Grid	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
3162	-	-	-	1	17	3.4
3163	4	14.3	11.4	4	164.5	131.6
3164	-	-	-	2	71	28.4
3262	-	-	-	1	27	5.4
3263	3	313.3	188.0	2	50.5	20.2
3264	1	43	8.6	4	77.5	62.0
3362	1	102	20.4	2	64.5	25.8
3363	3	323	193.8	5	213.2	213.2
3364	-	-	-	1	67	13.4
3462	2	9.5	3.8	2	42	16.8
3463	4	215.5	172.4	4	306.5	245.2
3464	3	108.3	65	2	83	33.2
3465	1	94	18.8	2	11	4.4
3562	1	146	29.2	-	-	-
3563	3	271.3	162.8	3	225	135.0
3564	4	225.3	180.2	5	114.6	114.6
3565	2	52	20.8	2	42	16.8
3566	1	201	40.2	1	5	1.0
3663	-	-	-	1	6	1.2
3664	5	188.2	188.2	5	307.8	307.8
3665	4	176.8	141.4	5	110.2	110.2
3666	3	217.3	130.4	1	6	1.2
3667	1	7	1.4	1	64	12.8
3764	3	194.3	116.6	5	81.6	81.6
3765	1	46	9.2	2	196.5	78.6
3766	2	65.5	26.2	-	-	-
3864	3	115	69.0	5	91.6	91.6
3865	4	177.3	141.8	5	153.8	153.8
3866	1	200	40.0	-	-	-
3963	1	12	2.4	-	-	-
3964	1	175	35.0	1	67	13.4
3965	2	162	64.8	3	57.7	34.6
3966	2	74	29.6	-	-	-
3967	1	18	3.6	2	185	74.0
3968	4	166.5	133.2	3	44	26.4
4063	1	148	29.6	1	100	20.0
4064	1	34	6.8	1	163	32.6
4065	-	-	-	1	120	24.0
4067	1	17	3.4	5	87.2	87.2
4068	3	39	29.3	4	145.3	116.2
4069	1	136	27.2	2	116	46.4
4167	1	212	42.4	3	57.3	34.4
4168	-	-	-	1	81	16.2
4169	1	8	1.6	1	16	3.2
4268	-	-	-	3	72	43.2
4269	2	70	28.0	-	-	-
4270	1	115	23.0	2	93	37.2
4273	-	-	-	1	96	19.2

Appendix 1 (cont.) Number of geese counted on each 1 km square within each count area, in autumn and spring, from 1988-89 to 1992-93 inclusive. Count dates used in autumn were 6.12.88, 2.12.89, 1.12.90, 1.12.91, 12.12.92. Count dates used in spring were 30.03.89, 10.02.90, 24.03.91, 10.02.92, 09.03.93.

LAGGAN

	Autumn			Spring		
Grid	No. yrs with geese (n)	Mean count	Five-year mean	No. yrs with geese (n)	Mean count	Five-year mean
2755	1	10	2.0	1	9	1.8
2855	1	18	3.6	-	-	-
2856	-	-	-	2	8.5	3.4
2857	-	-	-	1	6	1.2
2858	5	62.2	62.2	2	35.5	14.2
2955	2	53	21.2	1	4	0.8
2956	2	16.5	6.6	2	69	27.6
2958	3	59.7	35.8	2	57	22.8
3055	3	94.3	56.6	2	39.5	15.8
3056	3	82.7	49.6	4	53.5	42.8
3057	4	90.8	72.6	4	36.8	29.4
3058	5	124.4	124.4	5	41.6	41.6
3059	2	22	8.8	5	39	39.0
3154	2	54	21.6	-	-	-
3157	3	49.3	29.6	3	65.3	39.2
3158	4	55.5	44.4	4	60	48.0
3159	1	120	24.0	-	-	-
3258	1	130	26.0	5	53.2	53.2
3259	-	-	-	1	70	14.0
3358	4	137.8	110.2	4	83.5	66.8
3359	3	227.7	136.6	4	118	94.4
3361	-	-	-	1	7	1.4
3457	2	106.5	42.6	1	30	6.0
3458	4	54.5	43.6	2	51.5	20.6
3459	-	-	-	1	38	7.6
3460	1	39	7.8	2	84	33.6
3461	1	120	24.0	3	182.3	109.4
3558	-	-	-	1	13	2.6
3559	5	158.8	158.8	5	165.6	165.6
3560	3	45.3	27.2	2	201.5	80.6
3561	3	99.7	59.8	5	146.4	146.4
3660	-	-	-	1	133	26.6

Appendix 2. Whole farm counts, 1991/92-92/93

Note: A total of 18 counts were made during the 1992-93 winter, which were all used in estimating the mean farm totals for that winter.

		MEAN FARM TOTALS				MEAN FLOCK SIZES			
		1991-92		1992-93		1991-92		1992-93	
Count area	Farm name	MEAN TOTAL	NO. OF COUNTS	MEAN TOTAL	DAYS GWF PRESENT	MEAN FLOCK	No. FLKS	MEAN FLOCK	No. FLKS
RHINNS:									
BA	Ballimony	0.0	9						
BH	Bruichladdich	210.7	20	141.0	15	68.7	66	63.4	49
BS	Bolsay	34.3	12			82.2	5		
CF	Craigfad	23.2	10			77.3	3		
CL	Claddach	1.7	9	.9	1	15.0	1	17.0	1
CS	Conisby	50.6	13	147.9	9	50.6	13	204.8	13
CV	Cladville	105.7	11	115.6	12	77.5	15	80.0	26
CW	Carn west	0.0	10						
EE	Easter Ellister	1.8	9	4.3	4	8.0	2	9.6	8
GE	Gearach	1.5	10			15.0	1		
KE	Kelsay	0.0	10						
KI	Kilchiaran	196.0	16	50.2	4	184.5	17	180.8	5
KW	Kentraw	103.4	28	66.2	13	67.8	44	51.8	23
LO	Lossit farm (Rhinns)	27.3	11	8.6	3	75.0	4	51.7	3
MN	Balymeanach	142.2	9	28.1	4	64.0	20	72.3	7
OF	Octofad	135.5	12	73.2	13	73.9	22	82.3	16
OM	Octomore	219.7	14	145.0	14	76.7	43	115.3	24
PC	Port Charlotte	170.7	15	218.7	15	65.6	39	96.0	41
PR	Portnahaven	0.0	9						
PW	Port Wemyss	1.4	9			13.0	1		
WE	Wester Ellister	29.2	9	16.3	6	37.6	7	48.8	6
GORM:									
BB	Ballinaby	157.5	13	105.0	12	48.7	64	78.8	24
CO	Coul	212.1	15	323.9	17	52.4	93	85.7	68
FO	Foreland	150.5	16	50.7	10	56.3	49	43.5	21
GG	Grulinbeg	81.6	11	53.5	10	43.9	31	48.8	20
LK	Leek	112.0	9	189.8	15	59.5	17	92.4	44
RK	Rockside	448.7	23	403.3	17	93.6	148	123.1	59
SG	Sanaig	76.2	10	31.1	8	24.3	32	43.1	13
SM	Smaull	0.0	7	8.1	2			48.3	3
SU	Sunderland	384.4	29	305.6	16	80.9	193	107.9	51
GRUINART:									
AN	Ardnave	1.7	7	23.1	7	6.0	2	27.7	15
AO	Aoradh	148.5	29	210.3	18	27.1	402	24.3	156
BU	Bun an Uillt	7.9	8	2.3	1	21.0	3	42.0	1
CP	Corsapol	61.2	9	235.2	18	14.9	37	42.3	100
KA	Killinallan	0.0	7	1.1	1			19.0	1
KN	Kilnave	9.7	9	1.2	2	10.9	8	11.0	2
LY	Lyrabus	104.7	9	108.8	18	34.9	27	35.6	55
US	Uisge an t-Suidhe	105.6	9	71.2	15	36.5	26	28.5	45
KILMENY:									
BE	Bridgend	279.4	8	249.4	18	73.1	35	74.5	61
BM	Ballimartin	161.9	10	140.0	16	52.2	31	69.2	37
BN	Bunnahabhain	34.2	9	64.8	9	101.0	3	81.1	18
DA	Daill	52.2	7	44.7	7	72.4	5	100.6	8
EK	Esknish	226.3	15	273.1	18	72.1	47	69.6	82
EO	Eorrabus	325.4	9	288.3	18	72.4	44	59.5	94
FL	Finlaggan	158.5	8	120.8	15	73.0	23	67.9	32
KD	Knockdon	48.6	8	31.4	6	32.4	12	68.2	10
KL	Kiells	252.7	9	185.1	14	80.9	28	100.9	33
KM	Kilmeny	170.9	8	102.8	15	66.5	15	61.2	35
KP	Kepolls	305.0	10	144.3	14	74.6	49	58.5	51
MC	Mid Carrabus	196.1	8	109.9	16	57.7	31	33.5	66
MR	Mulreesh	88.5	10	120.2	16	35.4	25	48.4	47
OV	Octovullin	649.8	11	362.8	17	138.2	52	76.8	85
SC	Scarrabus	105.2	7	29.0	8	60.8	13	58.0	9

Appendix 2 (cont.) Whole farm counts, 1991-92 and 1992-93.

Count area	Farm name	MEAN FARM TOTALS 1991-92 MEAN TOTAL	1991-92 NO. OF COUNTS	1992-93 MEAN TOTAL	1992-93 DAYS GWF PRESENT	MEAN FLOCK SIZES 1991-92 MEAN FLOCK	1991-92 No. FLKS	1992-92 MEAN FLOCK	1992-92 No. FLKS
LAGGAN:									
AL	Ardlarach	24.4	7	28.3	10	13.2	13	25.5	20
BW	Bowmore	24.1	8	3.5	3	19.3	10	21.0	3
CG	Claggan	32.9	7	80.7	12	38.3	6	56.4	42
CR	Cruach	43.3	9	7.9	6	25.9	17	17.9	8
CT	Clachantree	57.6	8	81.4	16	18.4	25	43.1	34
CY	Corrary	128.6	7	109.4	12	30.0	30	98.5	20
DU	Duich	2.1	7	.6	1	7.5	2	11.0	1
GC	Gartachossan	272.4	7	113.8	15	44.0	47	51.9	41
GM	Gartmain	65.9	8	48.1	13	69.4	9	39.9	24
IH	Island House	24.3	7	100.0	11	11.3	15	75.0	24
LN	Laggan	49.3	8	61.4	14	18.8	21	34.6	32
MY	Mulindry	151.0	7	88.4	16	46.0	23	54.9	29
NB	Neriby	124.3	7	98.4	9	73.6	14	86.8	26
RM	Ronnachmore	61.7	9	34.9	10	32.6	17	29.9	21
TL	Tallant	203.9	10	124.8	17	47.4	43	36.5	62
GLEN:									
AV	Avenvogie	177.1	7	155.3	16	68.9	18	73.6	38
CC	Ceannacroic	81.1	8	72.4	16	59.0	11	48.3	27
CN	Cluanach	251.4	9	134.6	15	94.6	26	77.9	33
KG	Kynagarry	128.3	8	85.7	12	93.3	11	90.7	17
KO	Knocklearoch	95.3	7	73.7	8	111.2	6	120.5	11
LO	Lossit (estate)	11.4	7			75.0	4		
NG	North Glen	94.9	9	50.2	7	106.8	8	113.0	8
OA:									
BV	Ballivicar	428.6	9	600.9	18	52.1	74	98.9	114
CB	Cragabus	16.4	7	7.0	3	14.4	8	25.2	5
FH	Carraig Fhada								
GA	Glen Astaile	0.0	7						
GD	Glenegedale	58.8	8	70.1	11	42.7	11	51.4	26
GL	Giol	239.6	9	119.7	12	50.4	38	107.8	20
IV	Inveraval	55.0	3	28.5	3	110.0	1	85.5	6
KB	Kinnabus	278.5	8	311.4	18	54.3	41	101.9	55
KT	Kintra	148.7	10	241.8	18	41.3	36	55.7	79
LR	Leorin	553.9	9	357.9	18	95.4	56	59.1	109
PE	Port Ellen	30.7	7	8.6	6	107.5	2	25.8	6
RB	Risabus	180.3	9	115.2	13	64.9	25	79.8	26
UK	Upper Killeyan	105.3	8	51.5	7	73.7	10	67.7	15
ARDTALLA:									
AB	Ardbeg	7.3	8	6.2	3	58.0	1	29.5	4
AT	Ardtalla	0.0	8						
BY	Brahunisary	19.0	8	3.0	2	38.0	4	27.0	2
KR	Kintour	0.0	8						
LG	Laphroaig	341.1	8	321.1	17	121.6	25	118.7	53