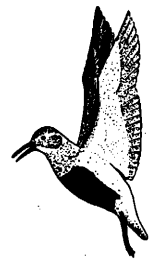
HEBRIDES SECTION



Editor

Dr. M. W. Pienkowski, Department of Zoology, University of Durham, South Road, Durham DH1 3LE, UK.

Before readers express concern that the Bulletin is about to fragment into very small geographical sections, we should explain that the present Section is an exceptional device allowing us to draw together some of the aspects of the joint survey of breeding waders by WSG and the Nature Conservancy Council (NCC) in the Outer Hebrides, off the west coast of Scotland, in summer 1983. (The Nature Conservancy Council is the statutory conservation body in Great Britain, established by Act of Parliament.)

This Section starts with an introduction by Harry Green, setting out why the survey was required and outlining some of the results. This is followed by an outline of "machair" and related habitats. We make no apology for devoting much of the rest of this Section to describing the census methods and checking on their accuracy and reliability. The urgent need for survey results meant that little time was available for developing from previous experience a census technique which would give realistic estimates in areas of high densities of breeding shorebirds. Consequently, we spent a great deal of effort in checking these, and expect that our experience may be of use to workers elsewhere planning comparable studies. The description of the method is followed by an analysis of seasonal differences in detectability (did the census take place at the right time?); a check of the validity of the method, by comparison with intensive studies in restricted areas (are the census totals close to the actual number of birds present?); a comparison between WSG and NCC results in areas censussed by both (were the results of the two teams comparable?); and a report of some observations made in developing the technique early in the season (in particular, were individual census workers observing in similar ways?).

What of the results? A very detailed dossier of the results of this study has already been made available to the regional staff of NCC in the Outer Hebrides, and is already in use in assessing the effects of any development proposals there. (The NCC Assistant Regional Officer for the Outer Hebrides, Dr. Nigel Buxton, was one of the WSG surveyors and has thus seen the work at all its stages.) For a wider audience, further analyses are in progress to describe the size and distribution of breeding wader populations of the machair, analyse their habitat selection, and place these populations in a wider geographical context. Papers will be submitted to various journals in due course.

To help readers appreciate better the unique wader habitats of the Outer Hebrides, we have included four pages of photographs (pp 10 - 13). Photographers are R.J. Fuller (Plates 4, 6, 8); G.H. Green (Plates 2, 3, 5); and Peter Wakely, Nature Conservancy Council (Plates 1, 7).

WSG Studies in the Western Isles have not, of course, ended - as Harry Green will outline below.

WSG / NCC SURVEY OF WADERS BREEDING ON THE HEBRIDEAN MACHAIR AND ADJACENT LAND, 1983

by G.H. Green

The aim of the Wader Study Group/Nature Conservancy Council (WSG/NCC) survey of waders breeding on the low-lying agricultural land on the western seaboard of the islands of South Uist, Benbecula, North Uist (and several small islands) in the Outer Hebrides of Scotland (Figure 1) was to determine the size and distribution of the large population known to breed there. It was thought that the information would be of importance in planning conservation measures because the area was expected to undergo considerable agricultural change through grant aid from the EEC Integrated Development Programme (IDP). Further references to the background to the survey and a short first report of the April-July 1983 fieldwork can be found in the August WSG Bulletin (Green 1983). Since that report was written there have been several discussions between WSG and NCC to plan the analysis and presentation of the survey data. The meetings were followed by some very intensive indoor work by NCC staff, particularly by A. Webb and A. Williams (who did most of the NCC's fieldwork) and by T.M. Reed. This has resulted in the production of a small number of copies of a 10 cm thick dossier of large scale maps and summary tables. This dossier is primarily for use by conservationists, especially NCC regional staff, and others in the Hebrides and it is an essential document for determining the conservation value for any particular site as far as waders are concerned. It is also a very useful data base from which a series of publications on Hebridean waders will arise. The dossier contains maps of the areas surveyed marked with the location of every pair of waders recorded by the surveyors. There are also transparent overlay habitat maps prepared from fieldwork by Bruce Philp of the Scottish Wildlife Trust.

The methods used by the surveyors and dicussions on the validity of the results appear elsewhere in this Bulletin. Briefly, waders encountered by surveyors walking along pre-determined transect lines 100 or 150 m apart were recorded on large scale maps. The dates of the main survey (5-19 June) were carefully chosen to coincide with the period when most waders were most obvious in attendance of small chicks. Work at other times provided a variety of other information including better estimates of Lapwing Vanellus vanellus numbers.

Table 1 and Figure 2 show the size of the area surveyed and the relative amounts covered by the NCC and WSG surveyors and jointly by both groups. The NCC surveyors were in the field from April to July and visited their sites on several occasions through the season. 15 WSG surveyors were in the field 5-19 June, with some additional work during the previous week by four people. The extensive survey by a large number of people within the short period when most waders were most obvious proved to be essential. Because of bad weather even this large team was unable to complete a second visit to all sites as had been planned. (Fortunately this did not impair the value of the survey: see following articles.) A smaller team would not have completed the survey.

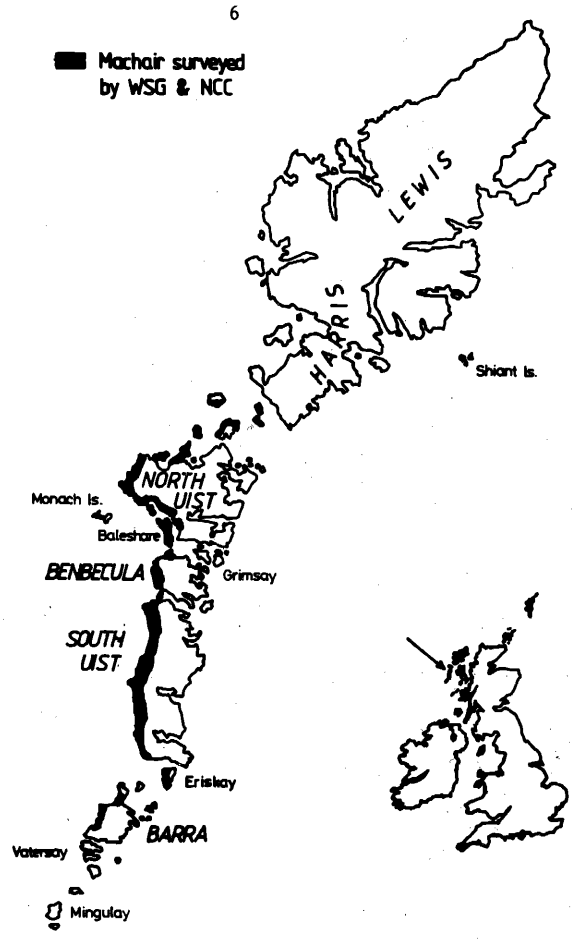


Figure 1. The Outer Hebrides, showing the areas surveyed in 1983.

Table 1. The number of hectares surveyed by WSG, NCC and jointly.

	WSG (ha)	NCC (ha)	Joint (ha)
Barra, Eriskay & Vatersay	905.6	-	-
South of South Uist	890.5	382.1	510.1
North of South Uist	838.6	1787.9	682.9
Benbecula	266.9	37.8	978.2
North Uist	3225.5	168.1	865.6
Islands in Sound of Harris	1560.6	-	-
Totals	7687.7 ha	2375.9 ha	3036.7 ha

Total surveyed area 13,100 ha

Of the total area surveyed, WSG surveyed 58.6%, NCC 18.2% and 23.2% were surveyed by both groups.

Table 2. Total numbers of wader pairs recorded by the WSG/NCC Survey

	Snipe	Lapwing	Oystercatcher	Dunlin	Ringed Plover	Redshank
Barra & Erskay	5	2	5	0	1	15
South of South Uist	188	519	208	269	222	471
North of South Uist	132	1051	484	860	895	596
Benbecula	56	322	216	158	135	221
North Uist	104	1210	928	412	583	506
Islands in Sound of Harris	26	347	230	344	280	162
Totals	511	3451	2071	2038	2116	1974

12,161 pairs of waders were recorded

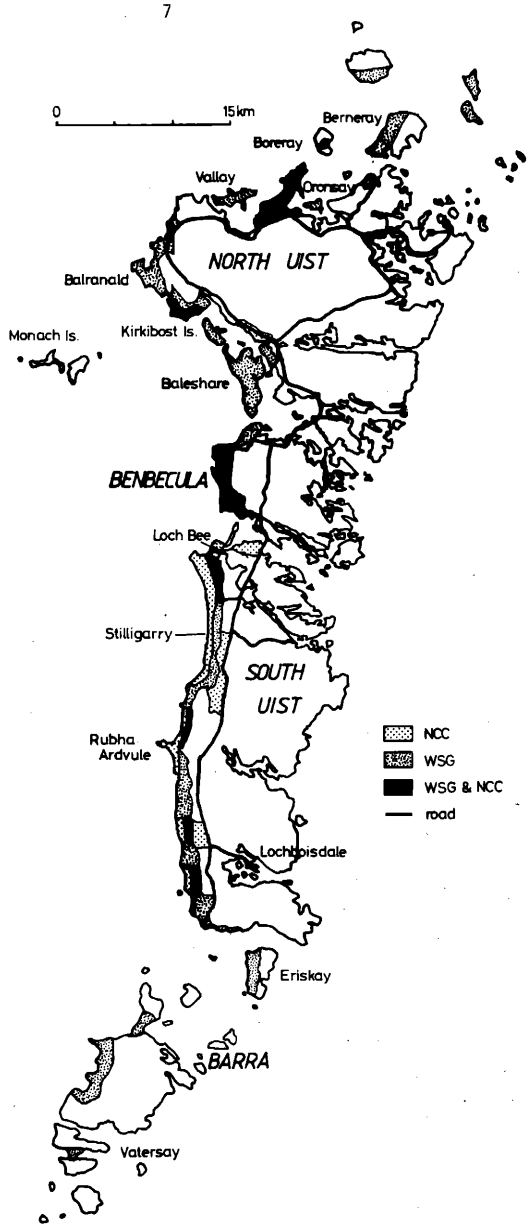


Figure 2. Areas of machair surveyed by WSG, NCC, and both groups, in 1983.

Table 2 shows the number of pairs of waders found by the surveyors. The numbers are the highest counts obtained on any visit to a site. They are unlikely to represent the actual total number of pairs in each area, because some pairs are likely to have been missed, especially Dunlin Calidris alpina and the inconspicuous Snipe Gallinago gallinago. The latter was undoubtedly underestimated by the method used. 12,161 wader pairs were located in the 131 km^2 surveyed. Although this note does not set out to compare the Hebridean wader population in detail to other European areas it is highly likely that the large numbers and dense populations are high compared with many other areas. For example, although Dunlins breed in many countries bordering the Baltic and southern North Seas those populations number only a few hundreds. In contrast the Hebridean population is over 2000. Dunlins are of course more abundant in sub-arctic Iceland, although the density may be lower. (The comparison with other areas will be developed later, as part of WSG studies.)

Table 3 shows the amount of each habitat type surveyed. Just over 7000 ha comprised wet or dry, cultivated or uncultivated machair, 3265 ha were adjacent blackland, 1800 ha were sand dune and there were smaller amounts of other habitats. The relative densities and distributions of each wader species on each habitat type have not yet been worked out. Preliminary examination of the maps shows striking differences in distribution relating to wetness of the habitat and cultivation. For example, Ringed Plovers Charadrius hiaticula favour cultivated dry machair while Dunlins are most abundant in wetter areas.

Now that the survey has been completed, what of the future? The IDP is undoubtedly going to change the present pattern of habitat types in some of the areas surveyed. Clearing of old silted drainage systems and possible creation of new ones with or without changes in land use will render some sites less to the liking of some wader species and perhaps more to the liking of others. The use of fertiliser, liming and perhaps drainage of acid blackland areas to produce more fertile pastureland may well increase the numbers and distribution of some species. N.E. Buxton and T.M. Reed have supplied data given in Table 4 which shows the number of grant applications received to date under the IDP. Nearly half of these relate to fencing and include replacement of old fences and erection of new ones. Enclosure of the machair habitat by fences is needed to control the movement of stock and to protect crops. So far relatively few applications have related to drainage, although some of these few are likely to reduce some wader numbers. If drainage applications do increase then better drainage is likely to reduce the extent of wetter habitats favoured by Dunlin, Redshank Tringa totanus and Snipe. Future management of drier grasslands by reseeding (following herbicide treatment) and wider use of fertilizers may well lead to an increase in silage production. This regime would be likely to reduce wader numbers but would be needed if stocking levels are to be increased and maintained in the islands over the winter. Because a full wader survey was completed before much change had taken place there is now an almost unique opportunity to study the effects of change (and no change) in agricultural practice on a wader population.

Table 3. The extent of each habitat type surveyed on each island (ha).

	M	SM	S	SL	D	C	W	A	F	B	H	O	No habitat data
Barra, Eriskay & Vatersay	27.1	0.1	119.5	1.4	481.3	4.2	55.6	0.8	11.4	48.6	0.	5.2	150.4
South of South Uist	0	0	147.9	15.7	333.3	68.7	292.2	20.1	66.5	702	44.6	91.7	0
North of South Uist	39.3	26.3	265	55.2	418.2	131.1	776.6	92.2	117.2	1110.4	44.7	233.2	0
Benbecula	24.1	12.3	100	1.0	275.4	56.3	176.5	9.3	51.6	484.6	0	75.5	16.3
North Uist	61.4	178.8	792.6	100.8	938.4	404.7	458.1	65.7	92.5	809.9	30	81	245.3
Sound of Harris Islands	3	8	387.3	136.4	221.6	22.7	1.8	1.7	2.0	109.6	0	0	666.5
Totals	154.9	225.5	1812.3	310.5	2668.2	687.7	1760.8	189.8	341.2	3265.1	119.3	486.6	1078.5

Key: M = maritime; SM = salt marsh; S = sand dunes (stable & unstable); SL = dune slacks; D = dry machair - uncultivated; C = dry machair - cultivated; W = wet machair - uncultivated; A = wet machair - cultivated; F = fen; B = blackland; H = moorland; O = open water.

Table 4. Applications for grant aid under the Integrated Development Programme in the Uists, Benbecula and Barra, September 1982 - August 1983.

	Number of applications in each category	%
Fencing	625	43
Machinery	225	15.5
Drainage	185	13
Reseeding	132	9
Buildings	89	6
Other types	196	13.5
Total	1452	100%

Such studies are both of intrinsic biological interest and of interest to conservationists who may be able to use the information gathered by the survey and future work to predict the likely effect of any proposed agricultural management of similar habitats and, conversely, to prepare plans for an area to be managed for waders. The WSG plans to be involved in future work in the Hebrides and it has three important objectives for the future:

1. To census annually, or near annually, wader populations in several extensive sites where there will (and will not) be agricultural change.
2. To repeat the full survey in 5 or more years time and at similar intervals in future to monitor the entire population.
3. To instigate detailed ecological studies aimed at explaining how each habitat type relates to the waders that live there. How do some areas support such dense populations of so many wader species?

Initial plans are being prepared for a limited survey in 1984 by WSG members. Several University Departments are showing an interest in the area and a few specific studies are being planned. We are sure there is a need for contact between the various people interested in Hebridean waders so that integrated plans (an Integrated Wader Programme!) can be prepared thus avoiding overlap of effort and wastage of funds. WSG would like to found a Hebridean Wader Contact Group as soon as possible and would be pleased if interested persons could write to the author of this note.

Acknowledgements

The survey was a joint enterprise between NCC and WSG. The WSG received funding from Nature Conservancy Council, World Wildlife Fund, Scottish Ornithologists' Club, British Ecological Society, British Ornithologists' Union, British Trust for Ornithology and the Royal Society for the Protection of Birds for which we are very grateful. The validation work by D.B. Jackson and S.M. Percival was supported partly by WSG funds and partly by the University of Durham. This note is based on the work of many people. A list of those involved and fuller acknowledgement are given by Green (1983).

Reference

Green,G.H. 1983. WSG survey to determine the number and distribution of waders breeding on the western seaboard of the Outer Hebrides, Scotland. Wader Study Group Bull. 38: 6-7.

G.H. Green, Windy Ridge, Littleton Comberton, Pershore, Worcs. U.K.