

for each calendar year in which they are actively colour-marking birds. The fee will also be levied from persons licensed by the NCC to use colour marks..... The imposition of such fees has been approved by the NCC and is authorised by the Wildlife and Countryside Act Part 1, 1b, (5)." Thus, any person receiving the go-ahead for his/her colour-marking scheme will be required to pay a fee to cover administrative costs. This fee must be paid for each year in which it is planned to mark birds. Furthermore, all existing schemes will be required to pay a servicing fee annually. The level of the annual servicing fee for wader colour-marking schemes has yet to be decided, but is likely to be of the order of £10 per species per year for most schemes. This note should be taken as notice to existing schemes to be prepared to pay a fee of this order at the start of 1984 if their scheme is to continue.

These new regulations may be greeted with some dismay by current and prospective colour-markers. However, it must be stressed that they have been introduced only because of the increasing difficulty in devising new colour-marking schemes, and the ever-rising costs of administration. It is felt that these costs should be borne by the ringers concerned, rather than the general WSG and/or BTO membership.

On the positive side, colour-markers may like to note that we are taking the opportunity of these rearrangements to continue to simplify registration procedures as much as possible; all applications for colour-marking of waders in Britain may be directed to WSG (rather than BTO, NCC or any combination of these). The completion of the new arrangements should also allow us more time for the actual handling of sightings. Do not, however, expect a totally efficient service: the registration fees are set to cover expenses, not the substantial amounts of time required of the people operating the register.

#### What happens next?

Registration forms and other documents are currently being revised to allow for the change. The actual procedure for collecting your money is still to be finalized. New projects will probably be charged for the first time as soon as their projects are approved. Existing projects will probably receive notification later in the year of the amount due if marking is to continue in 1984. Note that the new arrangements apply to all types of colour-marking, not just colour-ringing. All forms of temporary marking, however, already need re-registration each year: if anyone planning to use temporary marks in winter 1983-84 or summer 1984 has not already contacted WSG, they should do so immediately. They may already be too late to obtain approval.

#### Outside Britain

NCC and BTO have no powers to apply these new regulations in countries other than Great Britain (except to ringers operating elsewhere within the BTO scheme). However WSG members will appreciate the importance of continued international co-operation in studying this highly migratory group of birds. It is sincerely hoped, therefore, that ringers in other countries will consider very fully whether their proposals for colour-marking will meet the requirements set out above. We also hope that national ringing organisers will bear in mind the controls soon to be introduced over British ringers. (We know that several other national authorities operate strict controls, often in consultation with WSG - which has also been asked by Euring to operate the register on its behalf.) Furthermore, as the administrative costs of dealing with sightings of marked birds apply as much to birds marked outside Britain as within, WSG proposes the following: that all colour-marking projects from outside Britain, whether new or already registered with WSG, are requested to donate an annual fee equal to that required from British ringers. Such donations will serve to continue and strengthen the ideas of co-operation and goodwill so amply demonstrated in other WSG activities. We know that in several countries, currency control regulations prevent such payments; perhaps operators of marking projects there would be prepared to assist in other ways, such as by translating letters in languages outside the ability of the register co-ordinators. These arrangements relate to the Old World (particularly Europe and N.Africa) and not, at present, to America.

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## WSG SURVEY TO DETERMINE THE NUMBER AND DISTRIBUTION OF WADERS BREEDING ON THE WESTERN SEABOARD OF THE OUTER HEBRIDES, SCOTLAND

by G.H. Green

Casual observations and more detailed studies (Fuller 1981, Wilson 1978) have shown the low-lying western seaboard of the islands of North Uist, Benbecula and South Uist in the Outer Hebrides to be important breeding grounds for six species of wader: Lapwing *Vanellus vanellus*, Oystercatcher *Haematopus ostralegus*, Ringed Plover *Charadrius hiaticula*, Dunlin *Calidris alpina*, Snipe *Gallinago gallinago* and Redshank *Tringa totanus*. The urge to estimate the size and distribution of these populations has been with us for at least ten years. Recent developments such as the EEC funded Integrated Development Programme (IDP) have changed this urge from one of biological curiosity to conservation necessity. Many conservationists have expressed concern for the fate of Hebridean waders in the face of proposed EEC funded agricultural changes. It has become important to determine factual details of the wader population's size and distribution as quickly as possible. This view arose more or less independently amongst WSG officers and members (WSG Bull. 31:2, 32: 29-33, 35:5, 37: 1-2), the Nature Conservancy Council (NCC) and others. Hence a joint project between WSG and NCC was planned for 1983 with the aim of determining present distribution and numbers of waders and to prepare plans for future investigations, based on the 1983 results, of the effects of agricultural and other changes. The purpose of this note is to inform WSG members of progress and to give some preliminary results. Analysis of the survey data should be complete in a few months and a fuller report of methodology, results and future plans will be published in the December 1983 WSG Bulletin.

The most appropriate survey method for a project of this size and scope was thought to be one based on transects traversed on foot through selected areas. The method used in the field was developed in discussions with NCC and based on practical Hebridean experience (R. Fuller, J. Wilson pers. comm.) and transect methods used by NCC to assess wader numbers breeding in upland Britain (see for example Reed, Langslow & Symonds 1983). A compromise had to be sought between a detailed time-consuming survey and a reasonably comprehensive survey which could be completed within one breeding season.

The timing of the breeding season differs between the six wader species and, perhaps more significantly, the detectability of each species varies with the stage of the breeding cycle. Lapwing and Oystercatcher start to breed early in the year and pairs are most easily identified on territory in May. Dunlin and Redshank pairs are most easily found in the first fortnight of June when they have young which causes them to alarm-call and to mob the surveyor. Dunlin are difficult to detect at other times. Ringed Plover pairs are detectable over a fairly long period. Snipe are the most difficult to detect because they sit very tightly and are often not flushed by the observer. Counts of drumming birds may help but gross under-estimation of the actual number present is highly likely. The overall wader breeding season is quite long (April to July) and it contains a 'window' (about 4-18 June) when Redshank and Dunlin are most obvious. Because of the temporal distribution of detectability a two-pronged survey was planned to make best use of available manpower and financial resources. NCC funded two surveyors (A. Webb and A. Williams) to work in the Hebrides from April to July. WSG raised funds to send a team of 14 surveyors to the area between 27 May and 18 June with most people being present 4 to 18 June. Personnel (listed at the end of this note) were selected on a basis of availability, knowledge of Hebridean waders, surveying experience and ability and (hopefully!) for compatibility with everyone else and a judged ability to withstand the Hebridean spring weather!

One obvious requirement was to attempt to validate or 'calibrate' the transect survey results by detailed localized observations and nest finding in selected areas which were crossed by the transect lines. Part of this work was undertaken by D.B. Jackson and S.M. Percival, students in the Zoology Department at Durham University. The results of their work are very useful and will be reported in the December Bulletin. B. Etheridge and W. Taylor carried out an intense search for nests in one area to determine densities as part of another project continuing their earlier work (Etheridge & Taylor: WSG Bull. 36: 4-5). Between 27 May and 4 June R.J. Fuller, D.M. Green, G.H. Green and M.W. Pienkowski investigated various ways of interpreting transect observations and developed a method for estimating pairs in the field or immediately after field work which was used by the WSG survey team. Despite some bad weather WSG surveyors covered 27 sites on South Uist, Benbecula, North Uist and on several smaller islands. The total area surveyed was about 110 km<sup>2</sup>. All sites were visited once, several twice and a few on three occasions. The original aim of at least two complete surveys was prevented by bad weather. WSG surveyors walked about 750 km and some of them were a good deal fitter after the survey than before! The first rough estimates of pairs of waders within these areas are 1700 Oystercatchers, 1400 Ringed Plovers, 2700 Lapwing, 1500 Dunlin and 1700 Redshank. 600 pairs of snipe were recorded but this is not even a rough estimate of the actual population size. These totals are from the WSG plots only, including two areas on North Uist surveyed by C. Pickup and C. Morris, and they are taken directly from the surveyors' estimates of pairs. They do not include additional areas covered by the NCC surveyors. They are not estimates of the whole population in the west of the Southern Isles of the Outer Hebrides which, for some species, are likely to be at least twice the size. Nevertheless the total figure of about 9600 pairs of waders breeding in an area of about 110 km<sup>2</sup> gives some idea of the importance of the area. It is certainly the most dense and extensive population of breeding waders in the British Isles and probably in Europe. It is interesting to note that when the full estimates are available they will probably show that more Redshanks breed in the area than inland (excluding coastal saltmarsh etc) in the whole of England and Wales (Smith 1983). Arctic and sub-arctic populations of some of the species (Redshank, Ringed Plover, Dunlin) are undoubtedly larger but they are thinly spread over very large areas.

The large and unique wader populations confirmed by this survey could usefully be subject for further investigations. One is to carry out regular surveys to follow any changes which may occur naturally or following changes in agricultural practices. Another is to seek explanations for the dense population. What is the food resource? What are the habitat requirements for each species? Subsidiary studies of the interactions between individuals and species at high densities would also be of interest. WSG is already considering future survey work and plans will be discussed with NCC and others in the near future. We hope that WSG will be closely involved in future work.

#### Acknowledgements

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C. Pickup and C. Morris surveyed much of NW North Uist, including the RSPB's reserve at Balranald and their excellent results are included in the WSG survey.

Digger Jackson and Steve Percival, students at Durham University, made detailed observations and searched for nests at several sites for comparison with the transect surveys. Preliminary analysis shows their work to be of great value: thanks to them for a lot of hard work and to Peter Evans from Durham University's Zoology Department for making their project possible.

This note has been vetted by N.E. Buxton, R.J. Fuller and M.W. Pienkowski.

#### Personnel

The WSG surveyors were: R.J. Burkmar, N.E. Buxton, A. Davis, P.N. Ferns, I. Forsythe, R.J. Fuller, D.M. Green, G.H. Green, G. Johnson, B. Kaleyta, M. Moser, M.W. Pienkowski, K. Smith, F.L. Symonds and S.W. Walker.

#### References

- Fuller, R.J. 1981. The breeding habitats of waders on the North Uist machair. *Scottish Birds* 11: 142-152.  
 Reed, T.M., Langslow, D.R. & Symonds, F.L. 1983. Breeding waders of the Caithness flows. *Scottish Birds* 12: 180-186.  
 Smith, K. 1983. Where are all the waders? *BTO News* 125: 3.  
 Wilson, J.R. 1978. Agricultural influences on waders nesting on the South Uist machair. *Bird Study* 25: 198-206.