

Breeding Waders of Wet Meadows 1989

Title

Breeding Waders of Wet Meadows 1989.

Description

Wet lowland grassland as a habitat has been disappearing quite fast over the last few decades as more and more has been drained (in the 1970s this was estimated to be about 8000ha per annum) or otherwise rendered less suitable for breeding birds especially some of the waders which in the past have been more or less dependent on it.

In 1982 BTO organised a survey to identify all areas of damp lowland grassland in England and Wales and to count the numbers of breeding waders using them. Five species were counted: Lapwing *Vanellus vanellus*, Snipe *Gallinago gallinago*, Curlew *Numenius arquata*, Redshank *Tringa totanus* and Oystercatcher *Haematopus ostralegus*. Following this some monitoring of these wader populations was considered desirable, so in 1984 the Breeding Wader Monitoring Scheme (BWMS) was initiated by the BTO and the Wader Study Group (WSG) to provide information on annual fluctuations and trends in the populations of these species. (This monitoring lasted until 1989.)

The results of this in turn suggested that numbers of some wader species were still declining. In addition, in 1987, an RSPB survey of the Somerset Levels found that total breeding wader numbers there had fallen by 48%, and that Snipe numbers had fallen by 58%, in the 4 years since the previous survey in 1983.

To investigate this more widely in 1989 the BTO, with funding from the RSPB, conducted a survey of a randomly selected sample of all sites first covered in the 1982 survey. In addition to determining the population levels it also produced a snapshot of the effectiveness of site protection in maintaining breeding wader numbers over the seven year period.

Results indicated that numbers of Lapwings had declined significantly by 38% over the period, numbers of Oystercatchers had increased by 56% and numbers of Curlew, Redshank and Snipe showed no significant change although numbers of the last two species in both 1982 and 1989 were predominantly on nature reserves on which numbers had declined less than on unprotected sites.

Methods of Data Capture

For the 1982 survey, damp lowland grass was considered to be any area of grassland subject to freshwater flooding or waterlogging such as floodplain grasslands, coastal grazing marshes, washlands as well as isolated pockets of poorly drained grassland. Coverage was arbitrarily restricted to land below 600 ft (183 m) in altitude. No attempt was made to survey any areas subject to regular tidal flooding. For the 1989 survey a stratified random sample of the 1398 sites which had been surveyed in 1982 was selected. (See Notes on Survey Design for the details of the selection process.)

Observers were asked to survey all the fields within one of the randomly selected sites. Data were collected on a field by field basis, in contrast to 1982 when records were only

available at the site level. In all other respects the surveys were directly comparable. Three copies of a 1:12500 map of the site were provided, together with sufficient visit cards to record information on each field. Observers were asked to walk to within 100m of every part of each field within their allocated site and to complete their survey between dawn and 1200 hours. Three visits were requested, one in each of the periods 15 April-30 April, 1 May-21 May and 22 May-18 June, and that successive visits should be separated by at least a week. Cold, wet or windy weather conditions were to be avoided if possible. The location, movement and behaviour of all waders were recorded onto the field maps using standard codes. Each bird was allocated to a single field -- the first field in which it was recorded or, if the bird was first observed in display flight, the field at the centre of its display flight. At the end of the visit, summary information was transferred to the visit cards using the following criteria for each species: Lapwing and Redshank -- the total numbers of *birds* seen in each field; Snipe -- the number of drumming plus chipping birds in each field; other species -- the number of *pairs* (where 'pairs' = (paired individuals/2), displaying birds, nests or broods and other single birds not in flocks) assigned to each field.

Purpose of Data Capture

The stated aim of the survey was to provide a sample snapshot of the current status of waders breeding on wet lowland grassland in England and Wales and to find how this had changed since the complete survey of 1982.

Geographic Coverage

A random sample of 300 sites from the nearly 1400 covered in the survey of 1982. Sites were chosen using various specified criteria -- see Notes on Survey Design.

Temporal Coverage

The breeding season of 1989.

Three visits were requested to be made to each site, one in each of the periods 15 April-30 April, 1 May-21 May and 22 May-18 June and with successive visits separated by at least a week.

Other Interested parties

The survey was run jointly by BTO and Royal Society for the Protection of Birds (RSPB) with the funds coming from the latter.

Organiser(s)

Ken Smith and Mark O'Brien, RSPB staff members at the time, on behalf of BTO.

Current Staff Contact

archives@bto.org

Publications

The report on the survey is:

O'Brien, M. & Smith, K.W. 1992. Changes in the status of waders breeding on wet lowland grasslands in England and Wales between 1982 and 1989. *Bird Study* 39: 165-176.

It was noticed in *BTO News* numbers 149, 160, 161 and 168 (the preliminary report); and about monitoring in Scotland in *BTO News* number 184.

Available from NBN?

No.

Computer data -- location

The BTO Windows network central area.

Computer data -- outline contents

The numbers of birds and the characteristics of the 300 sites in the sample and the 1982 figures copied in as needed for direct comparisons.

Computer data -- description of contents

There are 5 files (all now as .txt files):

DATA1989: the bird data field by field.

Line 1: Observer's name and address; *Line 2:* Site Name, Level of Protection (if any), Site Number, County; *Line 3:* Visit Number, Date, Number of Fields; *Line 4 and subsequent:* 9 columns: col.1 field number, comma, walked through (1) or not (0); col.2 number of Lapwing, col.3 Snipe, col.4 Redshank, col.5 Curlew, col.6 Other ('2' = 2 birds, '2/2' = 2 birds acting as if with young); col.7 land use (as per card); col.8 %standing water, boundary type and height of water in ditch; col.9 amount of *Juncus* (0=absent, 1=1-10%, 2=>10%);

After all fields for that visit have been scored reverts to Line 3 type until all visits done then to new site.

FIELD SIZE: contains Site number, Field Number and Area of field (in ha) for each field on each site and a sum total. (Field areas were measured with the RSPB digitiser. 'SUM' does not necessarily equal combined sum due to measuring error and presence of bits within site which are not fields.)

NEWBIRDCOM: Numbers of waders in each site in 1982 and 1989 for all sites surveyed in 1989. (Done for Conservation Officers etc)

SOILTYPE: lists Site Number, OS Map 1:50000 number, altitude (m), and soil type as per maps produced by Soil Survey. (The altitude is the average at central Grid Reference -- read from contours. Maps vary hence some at 5, 10 15 m etc, others at 7, 14 21 m etc depending on the map seen.)

WADERRATIO: The numbers of waders on each site in 1982 and 1989, split by Region and within regions into a) sites with no waders in 1982, b) sites with waders in 1982, c) Reserves.

Information held in BTO Archives

5 Transfer Cases containing photocopies of the original cards – all have been scanned. The originals are stored at RSPB. The data from the monitoring 1983-1988 are stored in 2 Transfer Cases.

Notes on Access and Use

Full disclosure or display of site locations to the public might lead to environmental harm, and may jeopardise the goodwill of land managers/owners in terms of access for future survey work.

Other information needed

Notes on Survey Design

The 1400 or so sites surveyed in 1982 were split into 15 groups based on their location and status. Five regions were used corresponding to the Water Authority boundaries at the time (map as Fig. 1 of published report). These regions were used because each covered whole river catchments, so there was no risk of sites lying across regional boundaries. All sites within each of these regions were further sub-divided into three categories of protection status:

(a) Non-reserves with no breeding waders present in 1982: 'no wader sites' (20% of the 1982 sites were in this category);

(b) Non-reserves with breeding waders present in 1982: 'wader sites' (the majority of the 1982 sites);

(c) Reserves managed by the Royal Society for the Protection of Birds (RSPB), Nature Conservancy Council (NCC) or Wildfowl and Wetlands Trust (WWT): 'reserve sites' (33 sites). It was considered that surveying 300 sites would be feasible and would provide sufficient information on changes in wader numbers. Within each region therefore all 'reserve sites', eight 'no wader sites' and approximately 25% of the 'wader sites' were selected for survey. In addition detailed surveys, undertaken by the RSPB, of the Somerset Levels in 1987 and the Norfolk Broads in 1988 meant that data on changes in wader numbers were already available for these large areas of lowland grassland with results considered to be sufficient to describe the change in numbers within these two areas. So sites within these areas were not selected for 1989. Changes in wader numbers within each of the 15 groups were calculated and applied to the original 1982 data to provide an estimate of the overall change.

To analyse the impact of statutory wildlife protection status on the changes in wader numbers, the sample data were regrouped into 3 specific protection categories: Unprotected, Site of Special Scientific Interest (SSSI), and Reserve. If 50% or more of a site was within an SSSI then it was classed as an SSSI, and all sites that were both SSSIs and reserves were classed as Reserves. Data on the extent of SSSIs were provided by the NCC, with further checks made against records held by RSPB regional offices.

Specific Issues for Analysis

Since the results of the 1982 survey were published a number of studies of the relationship between census results and the numbers of nesting pairs had been published which allowed the interpretation of results to be improved. These were used to "clean up" the 1982

survey results to make them directly comparable to the data collected in 1989 (and subsequently in 2002).

For Lapwing it had been found that both members of a pair were present at the nest site during the late stages of incubation. Hence halving the maximum number of individuals recorded on site between mid-April and late May gives the best estimate of total number of pairs.

For Redshank the mean density of individual birds (excluding flocks) counted between mid-April and late May was correlated with peak nest density.

Fortunately, in the 1982 survey, the total numbers of birds present on each visit were recorded, so a revised estimate of the numbers of breeding pairs of Lapwing and Redshank could be calculated for the comparisons. The revised procedures increased the estimated numbers of Lapwing by 34% from 6869 to 9186 breeding pairs, and of Redshank by 35% from 2482 to 3361 breeding pairs for all sites in the 1982 survey.

For other species the methods used to calculate the number of breeding birds were the same as in 1982. For Snipe the maximum number of drumming birds between mid-April and late-May was used, whilst for all other species, the maximum number of pairs on any one visit was taken.

Changes in wader numbers between 1982 and 1989 were calculated using the procedure employed for the Common Birds Census. Confidence limits were calculated using a bootstrap method. For each species the changes in numbers on randomly selected non-reserve sites were calculated for each region. Changes in the overall wader populations of lowland wet grasslands between 1982 and 1989 were calculated by multiplying the number of waders recorded in 1982 in each 'region-status' group by the percentage change recorded on those sites that were surveyed in 1989 in that group. The numbers recorded for the Somerset Levels and for the Norfolk Broads were added to the totals for SW & Wales and the East Anglia regions respectively.

An assessment of the effectiveness of protection afforded by reserve and SSSI status was made by calculating the change in wader numbers on each site and comparing this across the protection categories. The change in numbers on each site was calculated using the Index $\text{SITE INDEX} = W89/(W82+W89)$ where $W82$ and $W89$ = number of waders present in 1982 and 1989, respectively. This index gives values of 0.5 when there was no change in wader numbers between the two years, zero when waders were present in 1982 but not 1989, and one when waders were absent in 1982 but present in 1989. Each site was then classed as declining (Index = 0 to < 0.35), stable (Index = 0.35 to 0.65) or increasing (Index = > 0.65 to 1) and a 3x3 contingency table drawn up comparing change with protection status. A likelihood ratio Chi-squared (or G) test was then used to test the possibility that there were differences between protection categories in trends in wader populations. If a significant result ($P < 0.05$) was obtained then a simultaneous test procedure (STP) using a G-test was used to compare all pairs of protection categories. To be significant at the 5% level these G values must exceed 9.49 (Chi-squared with (3-1)x(3-1) degrees of freedom) in the STP tests.