

Breeding Waders of Wet Meadows 2002

Title

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Description and Summary of Results

Wet lowland grassland as a habitat has been disappearing quite fast over the last few decades as more and more has been drained 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.

This 2002 survey was planned to document the breeding populations of wader species on wet lowland grassland sites in England and Wales, the majority of which had been surveyed in 1982 and which would therefore provide a direct comparison. Even in 1982 many of the birds that were found were on nature reserves or other sites which had some form of protection from detrimental agricultural practices but, despite this, most species were thought to have declined further. Continued careful management of all these sites is essential to try to halt the declines, while wider scale and more carefully targeted agri-environment schemes may hold the key to reversing declines in the longer term.

A total of 1051 sites were covered in 2002, of which 851 were also surveyed and/or have comparable data available for 1982. The sites varied in size from 2 to 1230ha, with a mean of 143ha (sd \pm 169ha). However, some extensive areas were split into several contiguous sites so that some much more extensive continuous areas were surveyed. As in 1982, there were significant concentrations of sites in areas with extensive lowland grassland, notably the Norfolk Broads, Somerset Levels and North Kent Marshes. Coverage in 2002 was significantly higher in the Severn and Avon Vale Natural Area (11115ha in 2002 compared with 4538ha in 1982). This extended coverage was to provide data comparable with a 1995 survey by the RSPB as part of wider-scale work on wetland recreation within the Severn and Avon Vale Natural Area.

There was a small number of areas where coverage in 2002 was less than in 1982, notably the Midlands (Leicestershire, Warwickshire and Northamptonshire) and NW Norfolk. To assess whether the sample of sites covered was biased, the wader occupancy rates on all of the 1982 survey sites were compared with those resurveyed in 2002. For four of the five species there was no significant difference in occupancy rates, but for Redshank it was found that the 2002 resurveyed sample included a higher proportion of sites that were occupied in 1982 than was the case for the whole 1982 sample. As colonization of sites where the species was not found in 1982 was rare, it is unlikely that this would have significantly biased the results in either direction.

Between 1982 and 2002 there were significant declines of 38% for Lapwing *Vanellus vanellus*, 61% for Snipe *Gallinago gallinago*, 40% for Curlew *Numenius arquata* and 29% for Redshank *Tringa totanus*. Oystercatcher *Haematopus ostralegus* increased significantly by 47% in the same period. Populations of all species were highly aggregated with most of the birds found on a small number of key sites. Site designation was found to be an important predictor of breeding wader distribution, density and density change.

(Note: The totals from the 1982 survey have been revised from the original analysis. Lapwing and Redshank numbers have been raised by 34% and 35% respectively, although numbers of the other species are unchanged. This follows fieldwork and analysis of the relationship between census results and the numbers of nesting pairs present for these species and which was carried out subsequent to the 1982 survey. They in turn have allowed the interpretation of the results to be improved, and they have been used to "clean up" the 1982 survey results to make them directly comparable to the data collected in 1989 and 2002.)

Methods of Data Capture

Waders were counted and mapped on three visits to sites, between mid-April and late June 2002. Data were compared with those gathered using identical methods in the 1982 survey and related to land use characteristics and conservation designation.

As in the 1982 survey, volunteer observers surveyed the majority of sites, but extensive areas (eg Norfolk Broads, Somerset Levels and North Kent Marshes) were surveyed by professional fieldworkers. The methods used now form the standard protocol for surveying breeding waders at lowland sites. Sites were surveyed using a whole area, field-by-field search method, which involved walking to within 100m of the entire survey area. The locations of all waders were plotted onto (minimum scale 1:25000) maps provided for each site. Observers visited each site three times between mid-April and the end of June with a request for at least two weeks between visits. Observers completed visits before midday and avoided adverse weather conditions of rain or moderate to high wind.

The survey focused on five main target species: Lapwing, Snipe, Curlew, Redshank and Oystercatcher. Observers also recorded any Avocet *Recurvirostra avosetta*, Little Ringed Plover *Charadrius dubius*, Ringed Plover *C. hiaticula*, Black-tailed Godwit *Limosa limosa*, Ruff *Philomachus pugnax* and Common Sandpiper *Actitis hypoleucos* which they came across as well as any Yellow Wagtails *Motacilla flava*.

As in previous surveys, observers were asked to record the total number of individual birds encountered and then to estimate the number of pairs present. A 'pair' was defined as: paired birds, displaying/singing individuals, nests, broods or other single birds not in flocks. The estimated number of pairs of each wader species at each site was also calculated by the analysts using methods which have been determined to be the most reliable following extensive work outside of this survey. For more specific details see various references in the report of the survey: Oystercatcher -- half the maximum number of individuals recorded on any visit between 15 April and 31 May; Lapwing -- half the maximum number of individuals on any visit between 15 April and 31 May; Snipe -- maximum number of drumming or chipping birds on any visit between 1 May and 24 June -- note that at some sites, birds were seen in May or June but drumming or chipping was not observed, and in these instances, the number of individuals/2 was used as a conservative estimate of numbers; Curlew -- (maximum number of individuals) \times 0.71 with 0.1 added for each specific place where the species was found; Redshank -- mean count of individuals between 24 April and 31 May.

Methods for interpreting numbers of the other wader species are not as well established as they are for the five main grassland species. For Avocet, the estimate was the highest number of pairs counted in April and May; for Little Ringed Plover, Ringed Plover, Black-

tailed Godwit and Common Sandpiper, all counts before 1 May were excluded as migrants of these species are regularly found during April (and to a lesser extent through May) in areas in which the species do not breed. Ruff were noted on many sites into early May but not thereafter, so counts of this species up until 10 May were excluded.

Purpose of Data Capture

The stated aim of the survey was to provide information on the current status and, when compared to previous equivalent surveys, population trends, for waders breeding on wet lowland grassland in England and Wales

Geographic Coverage

The survey protocol was aimed at being the same as for the 1982 survey. All sites which met the specified criteria of being "wet lowland grassland" in England and Wales were targeted.

Temporal Coverage

The breeding season of 2002.

Three visits were requested to be made to each site between 15 April and 30 June with a request for at least two weeks between visits.

Other Interested parties

The survey was run jointly with Royal Society for the Protection of Birds, English Nature (now Natural England) and Defra. All three of these also provided the majority of the funding necessary to run the survey.

Organiser(s)

Andy Wilson as a BTO staff member

Current Staff Contact

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Publications

The final report of the survey is:

Wilson, A.M., Vickery, J.A., Brown, A., Langston, R.H.W., Smallshire, D., Wotton, S. & Vanhinsbergh, D. 2005. Changes in the numbers of breeding waders on lowland wet grasslands in England and Wales between 1982 and 2002. *Bird Study* 52: 55-69.

A specific report on the Yellow Wagtails noted in the survey is:

Wilson, A.M. & Vickery, J.A. 2005. Decline in Yellow Wagtail *Motacilla flava flavissima* breeding on lowland wet grassland in England and Wales between 1982 and 2002. *Bird Study* 52: 88-92.

A conservation paper linking the results to management and policy recommendations is: Wilson, A.M., Ausden, M. & Milsom, T.P. 2004. Changes in breeding wader populations on lowland wet grasslands in England and Wales: causes and potential solutions. *Ibis* 146 (Supp. 2): 32-40.

The survey was noticed in *BTO News* numbers 231, 239 and 247.

For the definition of wet lowland grassland see:

Dargie, T.C. 1993. The distribution of lowland wet grassland in England. *English Nature Research Report* No. 49. English Nature, Peterborough.

Available from NBN?

Yes.

The dataset on the Gateway contains records from the 1982 and 2002 surveys. They are collated with summary 1-km grid references, and they also incorporate the improvements in interpretation of field results as noted in the Methods of Data Capture.

The BTO computer files contain the data as recorded in the field by the observers.

Computer data -- location

The BTO Windows network central area.

Computer data -- outline contents

An Access database containing all data as input. Summary files (in Excel) of total numbers of each species on each site, and a "cleaned" version of the 1982 data and Yellow Wagtail data in directly comparable form.

Electronic copies of the 3 papers noted.

Computer data -- description of contents

The following files are in the directory:

Breeding Waders of Wet Meadows 2002.mdb -- the 2002 survey data as input into a MS Access database.

BWWM 2002.xls -- an extract of the Access DB, using SAS, to produce this definitive Excel file of species totals on each site.

1982 data (cleaned 2001).xls -- a cleaned up version of the 1982 data in Excel (recalculated using exactly the same criteria as the 2002 data to make comparable).

Yellow Wagtail 1982.xls -- Yellow Wagtail counts for 1982.

There are 5 GIS files and a directory containing electronic versions of the Bird Study report, the Yellow Wagtail paper and the Ibis proceedings paper noted in Publications.

Information held in BTO Archives

1 archive box contains copies of all the data.

Notes on Access and Use

Full disclosure of display 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

"Wet lowland grassland" was broadly defined as any area of grassland below 183m (600 feet) above sea level subject to freshwater flooding or waterlogging. This definition excluded areas subject to regular tidal flooding and upland grassland. Most of the particular survey sites were chosen prior to the 1982 survey using an extensive desk-based survey to produce a list of all major lowland breeding wader sites that fulfilled the above criteria. However, more rigorous application of these criteria in the 2002 survey meant some original sites were excluded as they failed to meet the habitat criteria of being grassland below the altitude limit. These were mainly gravel pits, salt marshes or arable land. A number of additional sites were identified for the 2002 survey following extensive consultation with regional staff from the Royal Society for the Protection of Birds and English Nature, and the regional representatives of the BTO. Some of these additional sites were areas of wet grassland created since 1982 while others were simply not covered in the previous survey.

Boundaries for these additional sites were taken from those indicated in the inventory of wet lowland grassland in England (Dargie, T. 1993. *English Nature Research Report No. 49*).

Specific Issues for Analysis

Some of the survey methods have been developed more specifically since the 1982 survey. For the comparisons therefore all data from 1982 were reanalysed to ensure calculated population estimates were reached in exactly the same way for 1982 and 2002 data. Some of the survey forms for 1982 gave only an estimate of the number of pairs, rather than the number of individuals seen. This was particularly the case for Redshank. To calibrate these estimates, any counts in 1982 based entirely on pairs were multiplied by 1.75 and then 0.5 added per site to give an estimate of the number of individuals. This was based on a linear regression of individuals against pairs from all site visits where both individuals were counted and number of pairs estimated during the period 24 April to 31 May ($n = 2744$, $r^2 = 0.71$).