

Lapwing 1998

Title

Lapwing breeding 1998

Description and Summary of Results

Since the 1980s there had been widespread declines in the range and abundance of many species of farmland birds in Britain, and growing evidence linked these declines to changes in agricultural practices. Most attention focused on passerines, particularly seed eaters, associated predominantly with arable rather than grassland habitats. However, management and production of lowland grassland had also been transformed in the previous 50 years largely through changes in fertilizer, cutting and drainage regimes. This was likely to have had major consequences for bird species dependent on grassland habitats or on a mixture of grass and arable habitats, including waders eg (Northern) Lapwing *Vanellus vanellus* and thrushes eg wintering Redwing *Turdus iliacus* and Fieldfare *Turdus pilaris*.

The Lapwing has undergone a series of population fluctuations throughout the last two centuries. The breeding population declined in the 19th century due to egg collecting and the drainage and enclosure of farmland, increased briefly following the introduction of the Lapwing Act of 1926 and then declined again from the mid-1950s throughout most of Britain. Despite these declines the species remains the most common and widespread wader breeding on lowland grassland in Britain. However, population trends documented through the Common Birds Census (CBC) suggested relative stability from the early 1960s until the early 1980s but a steep and sustained population decrease after that. In addition, the 1988-1991 Breeding Atlas showed a marked range contraction from the southwest of England and parts of Wales since the previous atlas in 1968-1972. Successive surveys of lowland wet meadows (Breeding Waders of Wet Meadows surveys) included Lapwing and provided further evidence of a decline -- a fall in numbers of Lapwing of 38% in England and Wales between 1982 and 1989 and a decline in the number of sites holding Lapwing that was greatest in the south of Britain and least in the north.

This 1998 survey was a repeat of the 1987 national survey of breeding Lapwings in England and Wales, and hence allowed a direct comparison.

A total of 1312 of the 1713 tetrads selected in England and Wales were surveyed: 1261 by volunteers in 1998 and 51 by professional fieldworkers in 1999. This was 89% of the final total for the 1987 survey in which 1471 tetrads were covered. Coverage was lowest in the West Midlands (69% of selected tetrads) and highest in northern England (88% of tetrads). A very high proportion (97%) of those covered in 1998 was also covered in 1987.

The overall Lapwing breeding population for England and Wales in 1998 was estimated at almost 63000 pairs (95% confidence limits 55268-74499), a decrease of 49% since 1987; and 68% of these were found in the Northwest, Yorkshire/Humberside and Northern regions. Marked decreases were noted in all regions between 1987 and 1998, least in Yorkshire/Humberside (28% reduction) and Northern England (42%) and highest in Southwest England (64%) and in Wales (77%). The low number of birds estimated in Wales (1689 pairs) and Southwest England (2042 pairs) resulting in wide confidence limits, suggested a dramatic

and accelerating reduction in numbers there over the 11 years. In addition to a reduction in numbers, there was also evidence of a considerable reduction in range. In 1998, only 29% of tetrads held breeding Lapwings compared with 39% in 1987 with reductions again particularly marked in Wales and Southwest England.

A total of 2001 pairs of Lapwings were located in the 1998 survey, the majority (95%) on farmland. Arable farmland supported 39% -- 33% on spring tillage (primarily bare tillage, bare plough or newly emerged spring cereal), 4% on autumn tillage and 2% on set-aside fields; 56% of pairs were found on grassland -- 27% on rough grazing, 26% on permanent pasture, 3% on ley grass and 1% on unspecified grass; and only 94 pairs (5%) were found outside farmland habitats.

Habitat preference indices indicated that, overall, spring tillage was the most preferred habitat, followed by rough grazing. Permanent grass was used approximately as expected according to its availability, but autumn tillage and ley grassland were consistently avoided, and the former rather more so than in 1987. There were some regional anomalies, but these were often consistent between the 1987 and 1998 surveys: for example, a strong preference was shown for permanent grass in East Anglia and for ley grass in the East Midlands in both surveys.

Methods of Data Capture

The survey was designed to be directly comparable with the 1987 survey, so it followed the 1987 methods exactly in sampling strategy and field methodology. In 1987, one tetrad (2km × 2km square) was selected, at random, in every 10-km square of the National Grid which contained any land. This resulted in 1713 tetrads being selected in England and Wales. For the 1998 survey, these same tetrads were selected. (148 contained no land and were thus excluded.)

Fieldwork was undertaken mainly by volunteers. All survey tetrads were visited once, in early April in the south and in late April in the north, to account for differences in timing of breeding. The timing of the counts was designed to coincide with the peak period of the egg stage of the breeding cycle. All fields within the tetrads were searched completely either from vantage points along tracks, roads or footpaths or by walking through fields where visibility was obscured by vegetation or topography. The location of all pairs of Lapwings was recorded on 1:12500 site maps. Breeding pairs were identified either as incubating birds or territorial birds standing guard near a nest. Volunteers were asked to avoid poor weather conditions and to carry out counts only in the morning.

Habitat information was recorded either during the same visit or a separate one. Habitats were categorized into 20 broad types: autumn-sown cereals, spring-sown cereals, sugar beet, other spring-sown crops, oil-seed rape, plough, bare tillage, stubble, ley grass, permanent grass, moor/rough grass, unknown grass type, saltmarsh, dunes, gravel pits, waste ground, reservoirs, sewage works, airfield and other. All grass types were classed as grazed or ungrazed based on the presence or absence of livestock on the day of the visit. Overall therefore there was a total of 24 habitat types. Livestock type was also recorded. The proportion of the tetrad occupied by these different habitat types was recorded to the nearest 5% and the specific habitat associated with all Lapwings sighted was noted. Most observers also mapped the habitat on the 1:12500 maps provided -- not done during the 1987 survey.

Volunteer coverage was poor in some areas in 1998 and, to achieve more complete geographical coverage, an additional 51 tetrads, largely from the northwest of England and the East Midlands, were covered by professional fieldworkers in April 1999. Although these data were collected in a subsequent year they have been amalgamated into the total.

Purpose of Data Capture

The aims of the survey were:

- 1) to provide a breeding population estimate in England and Wales and to quantify any population changes at the national and regional level;
- 2) to investigate habitat preferences and identify possible causes of any observed population changes between this and the 1987 survey.

Geographic Coverage

A sample tetrad was randomly chosen from all 10-km squares which contained any land in all of England and Wales. The 1998 survey used the same tetrads as were chosen for the 1987 survey.

Temporal Coverage

The 1998 breeding season, in practice one visit in early (in the south) or late (in the north) April. To achieve more complete geographical coverage, 51 tetrads, largely from the northwest of England and the East Midlands, were covered by professional fieldworkers in April 1999.

Other Interested parties

The survey was run as a joint project with the Royal Society for the Protection of Birds and who also funded the project. Chris Watts and Richard Fuller were the professional fieldworkers who surveyed 51 tetrads between them in 1999.

Organiser(s)

Andy Wilson for the BTO.

Current Staff Contact

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Publications

The main report of the survey is:

Wilson, A.M., Vickery, J.A. & Browne, S.J. 2001. Numbers and distribution of Northern Lapwings breeding in England and Wales in 1998. *Bird Study* 48: 2-17.

The survey was mentioned in *BTO News* numbers 214 and 224.

Available from NBN?

No.

Computer data -- location

BTO Windows network central area.

Computer data -- outline contents

The survey data are stored as they were input. In addition most of the programs used to analyse these data are stored although it is not always clear exactly what each one does. Some programs and datasets stored refer to the 1987 survey as some parts of this were reanalysed for comparative purposes.

Computer data -- description of contents

1998survey -- the directory **Survey Data** contains the data from the survey as input (in 4 files): **engcount.dat** -- number of Lapwings in each habitat type in each 10-km square (the tetrad within it); **tet.dat** -- tetrads covered and whether or not covered; **hab.dat** -- visit and habitat data; **other.dat** -- uncertain. Other directories contain files related to Scotland (although not part of the survey) and Ulster (ditto) and others contain various programs (in SAS) used to analyse the survey data, the data from the 1987 survey and some atlas data.

Information held in BTO Archives

2 Transfer Cases containing copies of all data cards. All data cards have been scanned.

Notes on Access and Use**Other information needed****Notes on Survey Design**

A deliberate decision was made to survey exactly the same tetrads as had been chosen for the 1987 survey.

Specific Issues for Analysis

The methods of analysis followed those of the 1987 survey to ensure directly comparable results. Regional population estimates for the nine Ministry of Agriculture Fisheries and Food (now Defra) Standard Statistical Regions, were calculated by summing the numbers of Lapwings in all 10-km squares within each of these regions, and national estimates for England and Wales from summing these regional estimates. Possible biases may arise

because some 10-km squares contain tetrads in the sea and that Lapwing numbers may differ systematically between coastal and inland squares. Therefore separate estimates were made for each of four classes of tetrad falling into 10-km squares that: (i) contain no sea; (ii) contain sea but the sample tetrad contains no sea; (iii) contain sea and the sample tetrad contains both sea and land; (iv) contain sea and the sample tetrad contains no land (included in the analyses as zero counts). Thus, population estimates and confidence limits were calculated separately for each of the four tetrad classes and nine Standard Statistical Regions. Ninety-five per cent confidence limits were derived using the proportionately random bootstrap method to estimate the upper and lower 2.5 percentiles of the frequency distribution estimates derived from repeated simulations.

Although the percentage of each tetrad covered by, and number of Lapwings nesting in, each of 24 habitat types was recorded, some habitat types were amalgamated to ensure sample sizes were large enough to analyse habitat preferences regionally. The resulting five major habitat types were: autumn tillage, spring tillage (including bare tillage, bare plough and stubbles), ley grass (temporary grassland), permanent grass, and moor/rough grazing.