

## WILDFOWL COUNTS IN THE BRITISH ISLES

By George Atkinson-Willes, Central Organiser

WILDFOWL Counts were started in 1947 by the British Section of the International Wildfowl Inquiry Committee in an attempt to ascertain whether the populations of wildfowl wintering in this country were increasing, decreasing, or remaining unchanged.

The original conception of regular monthly counts of wildfowl for a prolonged period as the best means of providing the necessary evidence remains sound and unaltered in the light of experience and is a striking credit to the foresight of its authors. Certain refinements in the uses to which the results may be put have been evolved since, but the original plan of comparing year by year the numbers of each species on selected waters remains the basis of the investigation.

During the season of 1951-52 the Wildfowl Counts greatly increased the extent of their cover, and reference to the table below, which shows the progress of the counts before and since then, indicates that there is every sign of this interest remaining unabated. The upper columns of the table show the number of waters which were counted regularly each month throughout the season, whilst the lower columns show the number of waters for which isolated or irregular returns were received.

|   | 1948-49 | 1949-50 | 1950-51 | 1951-52 | 1952-53 | 1953-54 |
|---|---------|---------|---------|---------|---------|---------|
| <i>Regular Counts</i>                         |         |         |         |         |         |         |
| England .. ..                                 | 185     | 242     | 219     | 368     | 327     | 345     |
| Scotland .. ..                                | 37      | 50      | 53      | 85      | 77      | 91      |
| Wales .. ..                                   | 7       | 7       | 3       | 7       | 6       | 14      |
| Ireland .. ..                                 | —       | —       | —       | 18      | 39      | 36      |
|   | 229     | 299     | 275     | 478     | 449     | 486     |
| Percentage of counts<br>which are regular . . | 40%     | 59%     | 55%     | 71%     | 72%     | 77%     |
| <i>Occasional Counts</i>                      |         |         |         |         |         |         |
| England .. ..                                 | 253     | 163     | 166     | 137     | 124     | 105     |
| Scotland .. ..                                | 86      | 37      | 52      | 42      | 39      | 22      |
| Wales .. ..                                   | 5       | 6       | 7       | 5       | 5       | 9       |
| Ireland .. ..                                 | —       | —       | —       | 12      | 3       | 6       |
|   | 344     | 206     | 225     | 196     | 171     | 142     |
| <i>Total Regular and<br/>Occasional ..</i>    | 573     | 505     | 500     | 674     | 620     | 628     |

It will be seen that the number of 'regular' counts has increased whilst the number of 'occasional' counts has tended to dwindle. This steady rise in the percentage of 'regular' waters counted is eminently satisfactory, as they

have a wider application in the analysis of population trends, although the 'occasional' counts must also play a very important part in assessing the status of wildfowl in Great Britain.

The decrease in the number of 'occasional' counts is due not so much to their transference to the list of 'regular' counts but rather to the temporary abandonment of small waters which showed little or no results. The 'regular' counts on the other hand owe their increase in number to the addition of more major waters. Since the Wildfowl Counts started six years ago, information, some of it admittedly very incomplete, has been collected on the wildfowl populations of some 1100 waters.

#### **Organisation of the Counts**

It was appreciated at the very beginning that a project such as the Wildfowl Counts must depend for its success on the enthusiasm of its voluntary counters, and that as much use as possible must be made of local knowledge. It was decided that the only way to achieve this was to find county or Regional Organisers who would be prepared to run the counts in their own areas with a minimum of interference from headquarters. In this the Wildfowl Counts have been most fortunate. Seldom can an organisation have been served by such a willing band of helpers, and the success of the project is a direct reflection of their whole-hearted efforts. Limited space precludes a full list of all counters, but opposite is given a list of the Regional Organisers.



## REGIONAL ORGANISERS

*\*denotes British Trust for Ornithology's Regional Representative*

|                        |   |   |
|------------------------|---|---|
| BEDFORDSHIRE           | F. Gribble                                      | Jasmine, 42 The Grove, Bedford.   |
| BERKSHIRE              | W. D. Campbell *<br>assisted by                 | The School House, Cholsey.<br>C. E. Douglas (Reading Ornithological Club).<br>Middle Thames Natural History Society.<br>Newbury Field Club. |
| BUCKINGHAMSHIRE        | J. Field  | Widdbrook Cottage, Widdbrook Common, Cookham (Middle Thames Natural History Society).   |
| CAMBRIDGESHIRE         | I. C. T. Nisbet                                 | King's College, Cambridge. (Cambridge Bird Club.)   |
| CHESHIRE               | Maj. A. W. Boyd, M.C. *                         | Frandle House, Northwich.   |
| CORNWALL               | A. G. Parsons                                   | Parc Vean, Redruth. (Cornwall Bird Preservation Society.)   |
| CUMBERLAND             | W. Atkinson *                                   | 2, Duke Street, Penrith.  |
| DERBYSHIRE             | Capt. W. K. Marshall *                          | The Silverhill, Radburne, Kirk Langley, Nr. Derby.  |
| DEVONSHIRE             | D. P. Holmes                                    | 25, Lang's Rd., Paignton. (Devon Bird Watching and Preservation Society.)   |
| DORSETSHIRE            | J. C. Follett                                   | Windward, Mayfield Ave., Parkstone.   |
| ESSEX                  | Maj.-Gen. C. B. Wainwright, C.B.<br>assisted by | Little Berechurch, Colchester.<br>R. U. A. Marshall (Essex Bird Watching & Preservation Society).   |
| GLOUCESTERSHIRE        | H. Boyd   | The Wildfowl Trust, Slimbridge.   |
| HAMPSHIRE              | K. V. Edwards                                   | Buena Vista, Carlton Road, Southampton.   |
| ISLE OF WIGHT          | J. Stafford *                                   | 24, Cypress Rd., Newport, I.O.W.  |
| HEREFORDSHIRE          | C. J. Brecknell                                 | 243, Ledbury Rd., Hereford. (Herefordshire Ornithological Club.)  |
| HERTFORDSHIRE          | B. L. Sage                                      | 138 Fitzjohn Ave., High Barnet.   |
| HUNTINGDONSHIRE        | Professor A. N. Worden                          | Cromwell House, Huntingdon. (Hunts Fauna and Flora Society.)  |
| KENT                   | G. B. Rimes                                     | 65, Third Ave., Gillingham. (Rochester and District Naturalists Society.)   |
| LANCASHIRE, N.         | R. M. Band                                      | 516, North Drive, Cleveleys, Nr. Blackpool.   |
| LANCASHIRE,<br>CENTRAL | R. Donnally                                     | 96, Forest Road, Southport.   |

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| LANCASHIRE, S.                                       | E. Hardy                  | 47, Woodsorrel Rd., Liverpool,<br>15. (Merseyside Naturalists<br>Association.)   |
| LEICESTERSHIRE and<br>RUTLAND                        | Mrs Richardson            | 48, Stoneygate Rd., Leicester.<br>(Leicestershire and Rutland<br>Ornithological Society.)  |
| LINCOLNSHIRE   | R. K. Cornwallis          | Bleasby Grange, Legsby, Market<br>Rasen. (Lincolnshire Natural-<br>ists Trust, Ltd.)   |
| LONDON and<br>MIDDLESEX                              | R. C. Homes *             | 5, Shelters Way, Tadworth,<br>Surrey. (London Natural<br>History Society.)   |
| NORFOLK  | J. Williams               | Old Hall Farm, Tunstead, Nr.<br>Norwich.   |
| NORTHAMPTONSHIRE                                     | R. Felton                 | 37, Brecon St., Spencer Estate,<br>Northampton. (Northamp-<br>tonshire Natural History<br>Society and Field Club.)                                       |
|  | M. Goodman                | 18, Hallwood Rd., Kettering.<br>(Kettering and District<br>Naturalists Society and Field<br>Club.)   |
| NORTHUMBERLAND<br>and DURHAM                         | G. W. Temperley *         | Restharrow, Stocksfield, North-<br>umberland.  |
|  | assisted by               | Miss U. M. Grigg, 13, St.<br>George Terrace, Newcastle-<br>on-Tyne. (Natural History<br>Society of Northumberland,<br>Durham and Newcastle-on-<br>Tyne.) |
| NOTTINGHAMSHIRE                                      | A. Dobbs                  | 40, Caythorpe Rise, Sherwood,<br>Nottingham. (Trent Valley<br>Bird Watchers.)  |
| OXFORDSHIRE  | Dr Bruce Campbell *       | 2, King Edward Street, Oxford.   |
| SHROPSHIRE   | E. M. Rutter *            | Eversley, Kennedy Rd., Shrews-<br>bury.  |
| SOMERSET   | B. King                   | Mayfield, Uplands Rd., Saltford,<br>Bristol. (Somerset Archeo-<br>logical and Natural History<br>Society.)   |
|  | assisted by               | Miss E. M. Palmer, Highfield,<br>Sandford Hill, Bridgwater.  |
| STAFFORDSHIRE,<br>WORCESTERSHIRE<br>and WARWICKSHIRE | A. R. M. Blake            | 472, City Rd., Birmingham, 17.<br>(Birmingham and West Mid-<br>land Bird Club.)  |
| SUFFOLK (EAST)                                       | Lt-Col F. Penn            | Bawdsey Hall, Woodbridge.  |
| SURREY   | Haslemere N. H. S.<br>and | Charterhouse Natural History<br>Society.   |
| SUSSEX   | J. Reynolds               | 6, Argyle Rd., Bognor.   |

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|-------------------------------------|-------------------------------|--|
| WESTMORLAND and<br>LANCS in FURNESS | J. W. Allen                   | 122, Highgate, Kendal. (Kendal<br>Natural History Society.)  |
| WILTSHIRE                           | Mrs E. C. Barnes *            | Hungerdown, Seagry, Chippen-<br>ham. (Wiltshire Archeological<br>and Natural History Society.)   |
| YORKSHIRE                           | A. Walker                     | Penlee, 14, St. Helen's Rd.,<br>Harrogate. (Harrogate and<br>Wharfedale Naturalists<br>Society.)   |
|                                     | J. Cudworth                   | 17A, Prospect Rd., Ossett, Yorks.<br>(Leeds Bird Watchers Club.)   |
|                                     | R. M. Garnett *               | The Chapel House, Whitbygate,<br>Thornton-le-Dale.   |
|                                     | E. C. J. Swabey               | 46, Kennedy Ave., Fixby,<br>Huddersfield. (Huddersfield<br>Naturalists Society.)   |
| WALES, SOUTH                        | Col H. Morrey                 | 24, Bryngwyn Rd., Cyncoed,<br>Cardiff.   |
| CENTRAL WALES                       | W. M. Condry                  | Eglwysfach, Machynlleth,<br>Montgomery. (West Wales<br>Field Society.)   |
| WALES, NORTH                        | D. J. Williams                | 13, Hendre St., Caernarvon.<br>N. Wales.   |
| SCOTLAND                            | assisted by<br>Miss E. Garden | Bangor University Bird Group.<br>Foucausie, Grandhome, Aber-<br>deen. (Scottish Ornithologists<br>Club.)   |
|                                     | assisted by                   | Col W. M. Logan Home,<br>Edrom, Berwickshire.<br>P. E. D. Cooper, 31, Rosebank-<br>by-Carluk, Lanark.<br>Miss M. Flower, 5, Airthrey<br>Ave., Glasgow, W. 5.<br>Mr Milligan, High Street,<br>Rothesay. |
| NORTHERN IRELAND                    | L. Turtle                     | 34, Malone Park, Belfast.  |
| CO. FERMANAGH                       | Mrs Richardson                | Rosfad, Ballinamallard, Co.<br>Fermanagh.  |
| Eire                                |                               |  |
| CO. DUBLIN                          | G. R. Humphreys               | 59, Sandymount Rd., Dublin.  |
| CO. CORK                            | J. E. O'Donovan               | Union Hall, Co. Cork.  |

### The Analysis of the Wildfowl Counts

In the last report on the Wildfowl Counts,<sup>1</sup> published in 1952, the methods used to collate the information were described at some length. As these methods are still in use and remain fundamentally unaltered, it is felt that only a very brief summary is required here.

When the completed returns are received at the end of each season they are

<sup>1</sup> Obtainable from Miss Barclay-Smith, c/o British Museum (Natural History), Cromwell Road, London, S.W.7. (Price 2s.)

grouped into the geographical area to which they belong. For the purposes of analysis the British Isles have been divided into 23 areas, each of which is bounded so far as is possible by high ground or other terrain providing unsuitable habitats for wildfowl. Since each count is made on the same set date, the monthly records for every water in the same area may be added together with little fear of duplication, and the resulting totals, when plotted on a graph, will show the seasonal fluctuations in population. If, in later years, similar totals for the same group of waters are superimposed on the graph a direct comparison of one year with another may be made, and by this means in due course an indication of any population trend will become apparent. In this method of analysis, however, only counts made regularly throughout each season under review can be used as the direct comparison is essential and only a limited amount of interpolation is permissible.

### The Value of the Wildfowl Counts

It was decided during the summer of 1953 that the time was ripe to review the uses to which the Wildfowl Counts could be put and to obtain statistical advice on their value as a means of detecting population trends. The results for the years 1948-1952 were therefore submitted to Dr M. R. Sampford of the Lectureship in the Design and Analysis of Scientific Experiment at Oxford, and he very kindly spent a considerable amount of his time on them.

He reached the conclusion that the value of the counts might be considered under three main headings :

1. *As contemporary records* : If nothing more, the counts are a contemporary record of the populations of wildfowl on various selected waters. If a similar survey had been made during the first decade of this century, it would be of the greatest value at the present time, and it is reasonable to suppose that the present survey will in future years assume a similar importance.
2. *In relation to other branches of wildfowl research* : The Wildfowl Counts are primarily a study in distribution, and since distribution must necessarily be the basis of any investigation into the status and ecology of a species it seems probable that future studies into wildfowl problems and related research might well be based on information obtained through the counts.
3. *In detecting population trends* : The question has been raised whether the acknowledged lack of precision (caused by such factors as errors in estimating numbers, large fluctuations due to day-by-day weather variations, disturbance, etc.) which is inevitable in investigations of this type, would vitiate any attempt to detect population changes of a magnitude short of catastrophic. Dr Sampford has expressed the opinion, based on his provisional analysis, that such sources of variability will be of less importance than the considerable year-to-year fluctuation (due to periods of prolonged hard weather, etc.) which is likely to be the principal factor in tending to mask population trends. The investigation has not yet been carried on for a sufficient number of years for a reliable estimate of the magnitude of this variation



to be available, and without such an estimate it is impossible to assess the duration of observation which will be needed to detect a trend of any given order. In simpler language it is those sudden freeze-ups which are more likely to upset the value of the counts rather than the possible errors in counting.

### Reliability of the Counts

Although the standard of accuracy in counting is considered to be more than adequate for the main purpose of the investigation, every effort ought to be made to overcome as many of the numerous small sources of error as possible. The possible sources of error fall into four categories.

#### 1. *Errors in Counting*

(a) Incorrect recognition. Occasional cases of incorrect identification, usually of rarer species, are not disastrous as the numbers are likely to be small and in any case the counts are mainly designed to produce information on the main body of the common wintering fowl.

(b) Incorrect estimation of numbers. Overestimation of large numbers is possibly one of the commonest sources of error, but one which is likely to be reduced by experience. It must also be realised that underestimation, where it exists, is just as serious an inaccuracy, and the practice of subtracting a few hundreds from a large figure to allow for overestimation is not to be recommended.

(c) Lack of synchronisation in counting. It is not reasonable to ask for every count to be made at exactly the same time on the same day, and therefore some duplication must result. Disturbance due to counting is, however, more likely on small waters with correspondingly small numbers of wildfowl, and in some areas where duplication is likely to occur steps have been taken to synchronise counts.

#### 2. *Errors due to Natural Conditions*

(a) Differences in weather conditions. Certain weather conditions may be responsible for considerable error. During rough weather ducks inland are likely to be tucked away in reedbeds or sheltered bays, and on the coast to remain in creeks and saltings out of sight. A space is, however, provided on the count forms for observers to record unusual weather conditions which may be responsible for an abnormally high or low return.

(b) Differences in the density of vegetation. The density of aquatic vegetation in summer and early autumn and the tendency of moulting ducks to keep in cover are responsible for low returns at that period, but there is no reason to suppose that this factor varies unduly from year to year. Many species of wildfowl are not present in significant numbers in this country during this period, and only certain types of habitat are affected.

#### 3. *Errors due to Incomplete Cover*

Three main sources of error arise from incomplete cover :

(a) Disturbance or weather conditions might drive the wildfowl off a water normally counted on to one which is not, or vice versa.

(b) A large number of minor waters with small populations of wildfowl not normally counted might show a considerable change in status, especially of particular species, without this being reflected in the returns from the major waters.

(c) A certain type of water (e.g., gravel pits, ornamental lakes, etc.) might not be adequately represented in the cross-section of selected waters, with the result that any change in status of wildfowl peculiar to that particular type of water would not be presented in its true proportion.

The factors responsible for errors in this section, and to a large extent the solutions, are common to all three and may be discussed together.

The greatest difficulty has been found in recruiting observers in some of the more remote districts of the British Isles, although it is known that large numbers of wildfowl are present there. Even in areas where plenty of observers are available, there are many minor waters which are too small to warrant regular counting. They may, however, in the aggregate, carry a considerable population. Hitherto all the available effort has been directed towards an attempt to extend the counts in the thinly covered areas and a certain measure of success has been achieved in some places, but it now seems probable that an effort ought to be made to improve still further the cover in those areas already most thoroughly counted. To this end the following plan has been devised and is to be put into general use. It was tried as a pilot scheme in certain areas last year and proved successful.

All waters are to be divided into two categories.

*Category A* will contain all major waters which have been counted for some years and which are to continue being counted on the set count dates as hitherto.

*Category B* will contain all minor waters which carry small populations of wildfowl and for which a counter cannot be found on the set count dates. They are to be counted three or four times during the year, at any time convenient to the observer, but at about monthly intervals between October and February. At the end of the season the approximate capacity of each will be assessed and the counts on them will be abandoned for four or five years whilst other similar waters are being counted. In this way the wildfowl population of a very considerable number of minor waters can be assessed and a check on their status can be maintained every fourth or fifth year.

#### **Register of Waters (Operation Waterlog)**

With regard to the correct proportional representation of the various types of water covered by Wildfowl Counts, it has been suggested by Dr Sampford that in as much as the sample of waters counted will not be a true random sample of all waters in the British Isles because of the inconvenience of reaching remote areas, there is a very definite need for a register of all waters in the land. Such a register should include details of the type, size, environment and peculiarities of each water and would indicate whether any particular type of habitat was being ignored. There are many other uses to which a complete register could be put, both in direct relation to the Wildfowl Counts and in connection with studies into other forms of aquatic life. It is thought that if, as well as the details of the water itself, there could be added a note of the average population over a period of years of both surface feeding and diving ducks, it might in due course help to make possible an estimate of the country's total wildfowl population. In this project the returns from Category B waters would, of course, be of the greatest value. It should also be possible to determine which factors are most conducive to a high wildfowl population, a piece of information of the greatest importance in selecting sites for possible sanctuaries. A pilot survey is being attempted in the summer of 1955, to discover as many of the



practical difficulties as possible before launching the Register of Waters on a country-wide scale.

#### 4. *Errors of Analysis and Interpretation*

As has been explained above, the method of analysis consists of adding together the monthly counts of wildfowl on all waters which have been covered regularly in each geographical area and comparing the totals for each species graphically with similar totals obtained in previous years. This method has, however, two disadvantages. In the first place only the results from waters counted consistently throughout the season can be used (i.e., those in Category A). The results from waters in Category B (those counted irregularly or occasionally) can only be used to provide a check against a sudden change in status occurring on a large number of minor waters. It is, however, reasonable that the survey of population trends should be confined to the major waters provided that it can be proved that its accuracy is not being prejudiced by a change in status on the smaller waters.

Secondly, whenever a count on a Category A water is missed an interpolation must be made. Frequently this estimate can be based on an observation made a few days earlier or later, or on the preceding and subsequent counts. In such cases the accuracy of the interpolation is probably adequate, provided that it does not form too high a percentage of the total for the whole series. But if two or three consecutive counts on an important water are missed interpolation is impossible, and the series, being incomplete, cannot be plotted on its graph in that year.

The necessity for interpolation and the inflexibility of the system of analysis are without doubt two further sources of possible error, but so far no alternative method has been suggested.

In endeavouring to assess the reliability of the counts all these numerous possible sources of error must be taken into account. Dr Sampford has, however, expressed the opinion that singly none of them is likely to vitiate the value of the counts. But it should be realised that errors in individual counts, although perhaps not so serious as year-to-year fluctuations caused by weather conditions, will nevertheless be superimposed on the variability caused by these fluctuations, and will still further add to the difficulty in detecting a trend of moderate order. It is therefore desirable that individual counts should be made as reliable and as representative as possible.

#### **Wildfowl Counts and Ringing Data**

Ringing is, perhaps, the field of investigation most intimately allied to the Wildfowl Counts, but hitherto no attempt has been made to combine the information provided by the two methods of inquiry. A form of graphic analysis of ringing returns has now been designed, which it is hoped will help to disclose the three main items of information required by the counts.

1. The general line of the migration routes of each species which pass through a ringing station.
2. The 'speed of flow' of migrants passing through a ringing station at various times of the year.
3. The probable location at any given time of birds ringed at any other given time.

When this information is available it should be possible to relate the fluctuations in one geographical area to corresponding fluctuations in others, and even, eventually, to assess the success of the breeding season in certain areas outside the British Isles by relating them to wintering populations. Furthermore, some indication will be available of areas of high shooting pressure and periods of especial vulnerability, when the percentages of recoveries in various places and at various times are compared. It may also be possible to detect any differential patterns of migration (if these exist) by distinguishing in analysis between cock and hen and young and old birds.

### **New Counters**

Additional helpers are wanted in all areas. There must be many Members who could help with this work, but are not at present doing so. Anyone wishing to help is asked to write to the Central Organiser, at the New Grounds, or, preferably, to the appropriate Regional Organiser (listed on pp. 31-33).

