

Mute Swan 1990

Title

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Description and Summary of Results

The British population of the Mute Swan *Cygnus olor* was relatively stable from the mid 1950s to 1986-1987, but this apparent overall stability masked considerable population declines in some regions and increases in others. The changes at regional level were revealed by successive national breeding season surveys in 1955-1956, 1961, 1978 and 1983 and by analysis of long-term trends in regional abundance using winter count data. There have also been detailed studies of declines in the valleys of the Trent, the Warwickshire Avon and the Thames, and of a steady increase between 1977 and 1982 in the Lothians. Hard winters can result in considerable Mute Swan mortality and, in the late 1970s and early 1980s, the impact of lead poisoning, caused by the ingestion of anglers' fishing weights, came to be realised as well. Comparison of the annual population indices obtained from National Waterfowl Count (NWC) data for the Mute Swan with indices for three species with broadly similar habitat requirements (Great Crested Grebe *Podiceps cristatus*, Canada Goose *Branta canadensis* and Tufted Duck *Aythya fuligula*) showed that the Mute Swan was exceptional in not showing a considerable increase since 1955.

In early 1987 a ban was imposed on most sizes of lead weight for fishing, and the Mute Swan population appeared to respond rapidly – the National Waterfowl Count (NWC) index for the species increased markedly in the winters of 1987/88, 1988/89 and 1989/90. So for the 1990 breeding season, the BTO in conjunction with the Wildfowl & Wetlands Trust (WWT), and the Scottish Ornithologists' Club (SOC) were asked to undertake a national Mute Swan survey.

Overall, 85% of 10-km squares in Britain were covered or were considered to comprise habitat unsuitable for Mute Swans. Areas with high concentrations of the species can take considerable effort to cover, and for this and other reasons counts were not made in Benbecula and the Uists, Aberdeenshire, parts of the artificially drained regions of Huntingdonshire, Cambridgeshire and Lincolnshire, and sections of the Somerset Moors and Levels. Thus a disproportionately high number of densely populated squares were not covered which meant that a higher percentage of the final population totals that were estimated is higher than the proportion of the country that such squares comprise. Other squares were not covered because the habitat was unsuitable (in which case they were treated as "probable zeroes"), because they were remote, and for a variety of personal reasons.

The total population was estimated at 25748 birds of which 7946 (3973 pairs) were recorded breeding (with nest or young) and a further 2330 (1165 pairs) were holding territory but with no sign of nest or young. Just 12.5% of the overall total (20% of the breeding total) comprised subjective (but carefully considered) estimates made for areas that were not covered. On this basis, 31% of the population comprised breeding birds, a further 9% held territory without being recorded breeding, and 60% were non-breeders.

Forty one 10-km squares contained more than 20 pairs or more than 100 non-breeding birds, and together these accounted for 17% of paired and 29% of non-breeding birds. For probably the first time, the highest number in a 10-km square in Britain was not in SY58, containing the artificially maintained colony at Abbotsbury in Dorset. This, with 102 nesting pairs and 300 non-breeders (504 birds), was exceeded by the Loch of Harray and the contiguous Loch of Stenness on Orkney, where 140 pairs and 382 non-breeders (662 birds) were recorded in HY21 and, with an additional 20 pairs found on other parts of these lochs, meant that more than 700 Mute Swans were present. Many pairs on the Loch of Harray have abandoned the territorial habit and nest colonially, this being the only site where such behaviour has been recorded in Britain under natural conditions. Another important area was the valley of the Avon and its tributary, the Wylve, in Wiltshire, Hampshire and Dorset, with a total of 188 territorial and breeding pairs and 1052 non-breeders, about 3.7% of the British paired population and 6.8% of the non-breeders.

High concentrations of birds were only found over a small proportion of the range in Britain, with much lower densities being more usual. Nearly 60% of squares were unoccupied by paired swans, and 70% by non-breeders. The distribution of these was closely related to altitude and terrain, with large upland blocks of Scotland, Wales, northern and south-western England being devoid. In southern and eastern England, Mute Swans were only absent from dry, elevated or heavily wooded areas, often geologically associated with chalk, such as the Chilterns, central East Anglia, the New Forest and the downlands of Dorset, Hampshire, Wiltshire, Berkshire, Sussex and Kent.

Methods of Data Capture

The Mute Swan is perhaps one of the easiest common bird species in Britain to census and it appears possible to obtain reasonably accurate estimates of both non-breeding and breeding elements of the population. The 1978 survey was the first "modern" census of the species and the fieldwork technique proved so satisfactory that it was hardly changed in 1983 and 1990.

A major problem has always been the impossibility of obtaining 100% coverage, making it necessary to adjust population estimates by extrapolating from areas with good coverage. The coverage achieved in 1990 was the most comprehensive yet.

The 1990 survey asked for separate counts of territorial and of non-breeding Mute Swans in April and May. Ireland was not included because of the potential adverse effect on the breeding atlas being run at the time.

A key element was securing a sound basis for the extrapolation of population totals in the event of gaps in coverage. It was suggested that previous surveys had involved non-random sampling of squares, giving rise to bias in estimating total populations. So, despite reservations as to the practicality of achieving the desired result, each Regional Organiser was provided with a list of the 10-km squares in his or her region in random order with instructions to cover them in that order if complete coverage was deemed impossible. This failed, but it was only a problem in a few regions, and the subjective estimates made for these only comprise a small proportion of the results.

In the event of a square's being only partly covered, it was permissible for observers to provide a "best estimate" for the remaining part. Estimates were also provided for squares where it was not possible to organise coverage. In addition, squares known by Regional

Organisers never to have held swans because they contain no suitable habitat could be submitted as "probable zeroes" without being visited.

Swan counters used virtually identical techniques and recording forms in 1990 to those employed for the surveys of 1978 and 1983. Volunteer counters were asked to visit all wetland habitat suitable for Mute Swans in their squares between 1 April and 31 May, and for each square to fill in two simple forms, one for territorial birds and one for non-breeders. Details of localities, dates and numbers of birds present were entered. For territorial birds the total was split according to the breeding status of each pair: holding territory, at a nest, with cygnets or failed breeders. Using simple codes, recorders also marked the positions of all birds or nests found on a map. It was noted that non-breeding birds move about and observers were asked to try to cover their square in as short a time as reasonably possible and preferably in April as by May some failed breeders are likely to have joined non-breeding flocks.

In addition to the organised surveying there was a good deal of general publicity which resulted in many hundreds of offers of help from the general public.

Purpose of Data Capture

To produce an estimate of the total Mute Swan population of Great Britain and its islands, to discover how it has changed since previous surveys and to provide a base for future monitoring. Also to describe the distribution particularly in relation to the ban on the use of lead weights by anglers. All records were requested, of both breeding pairs and of non-breeding birds.

Geographic Coverage

All of Britain (not Ireland) and the aim was a complete census.

Temporal Coverage

The breeding season of 1990 with records requested for April and May.

Other Interested parties

The survey was carried out in conjunction with the Wildfowl and Wetlands Trust (WWT) and the Scottish Ornithologists' Club. Funding of the WWT organisers' posts was from the then Nature Conservancy Council and the Whitley Animal Protection Trust.

Organiser(s)

Jeremy Greenwood and Simon Delaney in England and Wales, Allan and Lyndesay Brown in Scotland.

Current Staff Contact

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Publications

A report was written by Simon Delaney, Jeremy Greenwood and Jeff Kirby in 1992 for the Joint Nature Conservation Committee summarising the results.

The only published report is:

Delany, S. & Greenwood, J. 1993. The 1990 national Mute Swan survey: provisional results. Pp 130-134 in Andrews, J. & Carter, S. (eds) *Britain's birds in 1990-91: the conservation and monitoring review*. BTO/JNCC, Thetford.

The survey was noticed in *BTO News* numbers 166, 169 and 173.

Available from NBN?

No.

Computer data -- location

BTO Windows network, central area.

Computer data -- outline contents

The data from the 1978, 1983 and 1990 surveys with equivalent data files. A few programs used to analyse these data.

Computer data -- description of contents

The root directory contains:

a file **extract90.out** (and similar for 1978 and 1983). This has 3 columns: a list of 10-km squares, the number of pairs and the third is unclear. For some the number of pairs is -1 and probably means not covered and not specified as being unsuitable.

2 pdfs of reports (one on 1990 survey, the other on the WWT 2002 survey);

Three Data directories (one for each survey):

data files contain a long string of characters which appear to be:

cols 1-4 10-km square; col 5 Site (A is the first pair or flock in the 10-km square, B the second etc, if blank appears to be a summary of the 10-km square which may or may not have birds in; cols 7-46 Site Name; cols 47-54 BTO Region; cols 55-62 Starting (or Central) Grid Reference (for river stretches); cols 63-70 Ending Grid Ref (for river stretches); cols 71-82 Type of site (one of the following: pond or lake, reservoir, gravel (or other) pit, river stream, canal, ditch (or rhine or dyke), estuary, sea-shore or give details); cols 83-86 Year; cols 87-88 NB (nonbreeder) or 'space B' (breeder); 10 x (2 cols for Day, 2 cols for Month and 5 cols for count, all right justified numbers); 70 cols for notes; 2 cols for code (T=Pair on territory, but without nest, N=Pair with nest, B=Pair with cygnets, D=Pair known to have nested, but failed); 1 space; 4 cols of code for habitat

The files are called xxxx.apr xxxx.jun xxxx.sor xxxx.rgst although the differences are not clear.

The directories progs oldprogs swanprogs are mostly (or entirely) FORTRAN programs originally written by Jeremy Greenwood to analyse the data.

There is a directory Miscellaneous containing various reports etc and oddments.

Information held in BTO Archives

2 Transfer Cases contain data sheets for breeding and non-breeding birds. 2 Transfer Cases contain analyses and miscellaneous files associated with the survey. All data cards have been scanned.

Notes on Access and Use**Other information needed****Notes on Survey Design****Specific Issues for Analysis**