Rook 1996

Title
Rook 1996

Description and Summary of Results
The Rook *Corvus frugilegus* is an abundant and widespread resident bird in the UK. Largely because of its preference for feeding on agricultural land it is also persecuted by some farmers as a pest, although the potential damage is at least partly countered by its feeding on invertebrates, many of which may themselves otherwise reduce agricultural yields. Rooks have sometimes also been persecuted on the grounds of a threat to public health because of nesting in trees above public spaces.
Because of these issues, since 1993 there has been a system whereby the UK government can issue a licence for killing Rooks.
There is a long history of local Rook censuses in regions or counties of the UK, but they were not monitored well by BTO surveys until the advent of the BTO/JNCC/RSPB Breeding Bird Survey in 1994. There had been attempted complete surveys in 1944-1946 (not including Northern Ireland) and 1975 (which, with fill-in counts in 1976-1977, covered 94% of all 3011 10-km squares in the UK); and a sample survey in 1980. This last did not set out to cover Northern Ireland or Scotland north of Glasgow and Edinburgh and many of its planned squares were not covered – 482 10-km squares were covered, and more than 234000 nests counted – but its estimate of change since 1975 is likely to be biased by the non-random distribution of sample squares.
So, in spring 1996, a new nationwide sample survey of rookeries was planned with the object of providing an estimate of the size of the breeding population and to estimate the change since the previous full census in 1975, both of which would help government take decisions on the effect of the general pest control licence.
Of the 1997 tetrads selected for coverage in the UK and the Isle of Man, a full report was received from survey volunteers for 1918 (96%) and partial reports for a further five. Full reports (but no birds) were also received for both tetrads selected in the Channel Islands. More than 42000 nests were counted. There was no reason to believe that the tetrads not covered in any way biased the otherwise random sample, and the high percentage coverage achieved would have ensured that its effects on the survey results were minimal.
Overall 29% of selected tetrads recorded Rook nests with the highest proportion in SW England and Northern Ireland (more than half with nests) and much lower in Scotland than elsewhere. But, despite Scotland's relatively low density overall, the eight largest rookeries counted were all in Scotland. Rookeries there averaged 80.7 nests (median 36) which was more than twice as many as those in any other UK region -- average was 30.2 in England (median 19), 29.0 in Northern Ireland, and 25.4 in Wales.
Overall, 70% of nests counted were in deciduous trees, 25% in conifers and 5% in other or unrecorded situations. Deciduous trees were especially oaks and sycamore, but more than half of all nests in Scotland and the Isle of Man were in conifers, mostly Scots Pine.
The survey estimated that there were 1.27 million nesting pairs of Rooks in the UK and Isle of Man in 1996 (95% confidence limits 1.12 to 1.44 million). Of these, 712000 were

estimated for England and the Isle of Man, 377000 for Scotland, 126000 for Northern Ireland and 53000 for Wales. Comparing to tetrads surveyed in the 1975 survey, Rooks increased by 41% (95% confidence intervals 27-59%) over the period, but the total was less than that estimated for 1944-1946. National data and those from local surveys suggested that population changes had not been uniform across the UK, but change estimates were partly dependent on assumptions about the thoroughness of coverage in 1975-1977, and some estimates of increase may be too high.

Methods of Data Capture

Rook nests are conspicuous: making it one of the simplest breeding bird species to census; but extremely clumped into colonies and with a high turnover in location: making it necessary to cover a large area and be either complete or drawn from a carefully constructed sample.

A sample size of 2000 was determined after comparing the sample sizes and resulting precision of population estimates found by other recent national surveys; and BTO representatives in three large regions confirmed that this requested level of coverage was likely to be achievable both in their regions and nationally. With even sampling across 125 BTO regions, a uniform level of 3.14% of tetrads was selected in each region, resulting in the selection of 1999 tetrads.

Counting methods aimed to obtain a maximum count of each rookery just before bud-burst in mid- or late April, this being the same as for previous BTO Rook surveys. A rookery was defined as any active Rook nest, or group of nests 100m or more from the next nearest nest.

Observers were asked to record each rookery within or partly within their tetrad. Total counts of nests within (and outside where the colony straddled a boundary) their tetrad, and the numbers in each 'tree category' (this allowed for 'deciduous', 'conifer' etc as well as identifying the tree to species). They were also to note parts of the tetrad they could not or did not visit. (The instructions stressed the importance of accurate mapreading in partitioning rookery totals within and beyond the tetrad boundary.) The total number of nests in each rookery was also requested, whether the nests were inside or outside the tetrad boundary, to enable comparison with earlier surveys where the data essentially covered whole rookeries, assigned to the 10-km square within which their centres lay. Distinguishing occupied and unoccupied nests requires detailed observation and is not recommended for extensive studies. As in previous surveys, observers were requested to count all ‘nests’ other than what were clearly disused structures and nests belonging to other bird species or to squirrels. Where no accurate count of nests was possible, observers were encouraged to enter an estimate, together with a putative range to indicate its precision.

Purpose of Data Capture

The aims of the survey were to provide an estimate of the size of the UK breeding population and therefore to estimate any change since the previous full census in 1975.

Geographic Coverage
All of the UK including the Isle of Man and the Channel Islands. Tetrads (2-km squares) were selected randomly for coverage.

Temporal Coverage
The breeding season of 1996 with the majority of counts submitted from counts between mid-April and early May.

Other Interested parties
The survey was run by the BTO with funding from the Department of the Environment (later known as the Department for the Environment, Transport and the Regions (DETR) and now Defra).

Organiser(s)
John Marchant

Current Staff Contact
archives@bto.org

Publications
The main report of the survey is:
Marchant, J.H. & Gregory, R.D. 1999. Numbers of nesting Rooks *Corvus frugilegus* in the United Kingdom in 1996. *Bird Study* 46: 258-273.
The survey was also noticed in *BTO News* number 209.

Available from NBN?
No.

Computer data -- location
BTO Unix network central area.

Computer data -- outline contents
The data file containing the counts from the 1996 survey is ro96.mst and there are equivalents for the 1980 and 1975-76 surveys in the same directory. The file tets lists the 1999 tetrads randomly selected and another 1999 selected for possible use in the future. Various programs used for analysis and some output files also included.

Computer data -- description of contents

The main data file for the 1996 survey -- ro96.mst has the format:

Columns 1-2: county (standard BTO 2-letter code); cols 4-7: 10-km square; col 8: tetrad letter; col 10: coverage (1=complete report, full cover of tetrad; 2=complete report, from partial cover or local knowledge; 3=incomplete report from partial cover; 4=no report (no cover); 5=coverage not requested as part of sample); col 11: Activity ???; cols 12-13: colony no.; cols 15-54: colony name (often blank); cols 55-62: central grid ref (2 letters + 6 figures); cols 64-69: day, month, year as DDMMYY; cols 71-73: total number of Rooks; cols 74-76: number (of these) outside tetrad; cols 77-79: nos in ash; cols 80-82: nos in beech; cols 83-85: nos in elm; cols 86-88: nos in oak; cols 89-91: nos in sycamore; cols 92-94: nos in deciduous; cols 95-97: nos in scots pine; cols 98-100: nos in conifer; cols 101-103: nos in other.

tets contains the 1999 tetrads selected and another 1999 for future expansion. Format is:

Cols 1-3: reference number (within region); cols 5-10: the random number used to select the tetrads (can be ignored???); cols 13-17: tetrad as 2 letters, 2 numbers and letter; cols 20-25: grid reference of SW corner; cols 28-29: landclass (ITE); cols 32-33: nuts (seems to be government regon???); cols 35-38: BTO region (4 letter code); cols 40-43: total no of tetrads in region; cols 45-46: no of tetrads selected in region. Note that the number specified in the file for each region is twice this last number.

Information held in BTO Archives

1 Archive Box and 1 Transfer Case containing data and letters.

Notes on Access and Use

Other information needed

Notes on Survey Design

Both the 1975 and 1980 surveys had used the 10-km square as their counting unit, but experience showed that this was too large an area for volunteers always to be expected to achieve complete cover. The 1996 survey therefore used tetrads. Results from tetrads were thought to be both more reliably complete and more easily repeatable. The drawbacks of using a smaller counting unit were that more would be empty, reducing the appeal of the survey to volunteers, and that a higher proportion of rookeries would be bisected by the boundary of the counting unit, making assessments of nest density more reliant on the observers' map-reading skills and diligence in recording.

Stratification of the sample might have helped to target fieldwork effort more effectively but was dismissed both to avoid unnecessary complication, and because no suitable data sets were then available to help design the sample.

Specific Issues for Analysis

Nest counts were summed for each tetrad in three separate ways: 1) the sum of all nests in rookeries at least partly within the tetrad. These were the sample sizes for analyses of rookery size and tree composition; 2) nests within the tetrad boundaries were summed, to

estimate nest density within each tetrad; 3) for comparison between the 1975 and 1996 surveys, totals were assembled, separately for each survey, of all nests in rookeries with a central grid reference within the tetrad.

Regional population sizes (using the UK's 11 European Community regions) were estimated by averaging nest density across all sample tetrads regionally and multiplying by the total number of tetrads belonging to each region. National population sizes were estimated by summing the estimates for the appropriate regions.

Paired counts were only accepted as valid for assessing population change where coverage was complete in both surveys. Double zeros were eliminated.

Confidence intervals of population size and change were calculated by bootstrapping, involving 999 random resamples, with replacement, from the whole dataset.