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## Status and distribution of Corncrakes in Britain in 1988

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The population of Corncrakes *Crex crex* in Britain and Ireland has been in decline for over a century (Alexander 1914; Norris 1945, 1947; Sharrock 1976; O'Meara 1979; Cadbury 1980). Declines were first reported as early as 1850-75 in southeast England and became more widespread by the early 1900s (Norris 1945, 1947). By 1939, Corncrakes were still numerous in the Northern and Western Isles of Scotland, but were local and declining in southern Scotland, the north and west of England and in Wales, and were irregular or absent in southeast England (Norris 1945). In Ireland, the Corncrake's status was similar: numerous in the northwest, but local and declining elsewhere (Norris 1945). More recently, the Corncrake's breeding range has contracted farther to the north and west of both Scotland and Ireland (Sharrock 1976; O'Meara 1979; Cadbury 1980).

A national survey of the British population in 1978-79 recorded 700-746 singing Corncrakes (Cadbury 1980). Since then, further declines have been noticed in some areas (e.g. Canna: Swann 1986), but not in others (e.g. Islay: Stroud 1986; and Tiree: Cadbury 1989). This paper reports the results of a comprehensive survey of the British breeding population in 1988, organised by the Royal Society for the Protection of Birds. At the same time, a similar survey was conducted in Ireland, co-ordinated by the Irish Wildbird Conservancy (Mayes & Stowe in press).

## Methods

### *Background to census techniques*

The only practical way of conducting a census of Corncrakes is to count those that are singing, which in most surveys are presumed to be males.

The census techniques used here were developed during a study of breeding Corncrakes in the Uists, Western Isles (Stowe & Tonkin 1985; Stowe & Hudson 1988; Hudson & Stowe in prep.). Three pieces of information of relevance to the survey were obtained during that study. First, singing Corncrakes are usually stationary at night from 21.00-22.30 to 03.00-05.00 GMT (unless disturbed). Secondly, during the day, Corncrakes may wander up to 600 m from their regular night-time singing location, often into areas which are also used by one or more other Corncrakes. Thirdly, although Fisher (1963) reported a female Corncrake singing in captivity, no evidence was discovered from radio-tagging of males and females to suggest that females ever sang.

### *Determination of singing frequency*

During the study on the Uists, nine male Corncrakes were radio-tagged and tracked by day and by night for varying periods in 1985 (for details see Hudson & Stowe in prep.). Each time a Corncrake was visited, its singing activity was recorded in one of three categories: (1) continuous singing (repeated 'crex' call at a rate of about 90-100 per minute while observer was in earshot), (2) sporadic singing (anything from a single call to short bursts), and (3) silent. Individuals were visited between one and 22 times per day on most days, until their radios ceased to function. The data covered 207 bird-days amounting to 963 observations.

The frequency with which these nine Corncrakes sang is presented in fig. 1. Not all individuals sang each night, and the best chance of hearing one sing was between midnight and 01.00 GMT (singing heard on 89.8% of visits,  $n=39$  bird-days). Continuous singing, of the kind required for effective census work, was recorded on more than 70% of visits only between 23.00 and 02.00 GMT, with the peak occurrence also between midnight and 01.00 GMT (fig. 1). All singing activity was substantially reduced after 04.00 GMT and did not increase again until 21.00 GMT. Clearly, if these results are generally applicable, they indicate that survey work before 23.00 and after 02.00 GMT would seriously underestimate the numbers present.

### *Determination of calling period*

Corncrakes first return to their breeding grounds in late April or early May. The Uists radio-tagging data covered the period 20th May to 4th August 1985, but with most for June (696 observations; May = 126; July = 132; August = 9). The proportion of Corncrakes singing by hour did not vary when examined by month\*. None was, however, caught until 20th May, and only one was monitored after 13th July, as all the others had lost

\*Spearman's rank correlations of month versus month for May, June, July and August were all significant,  $P<0.05$ .

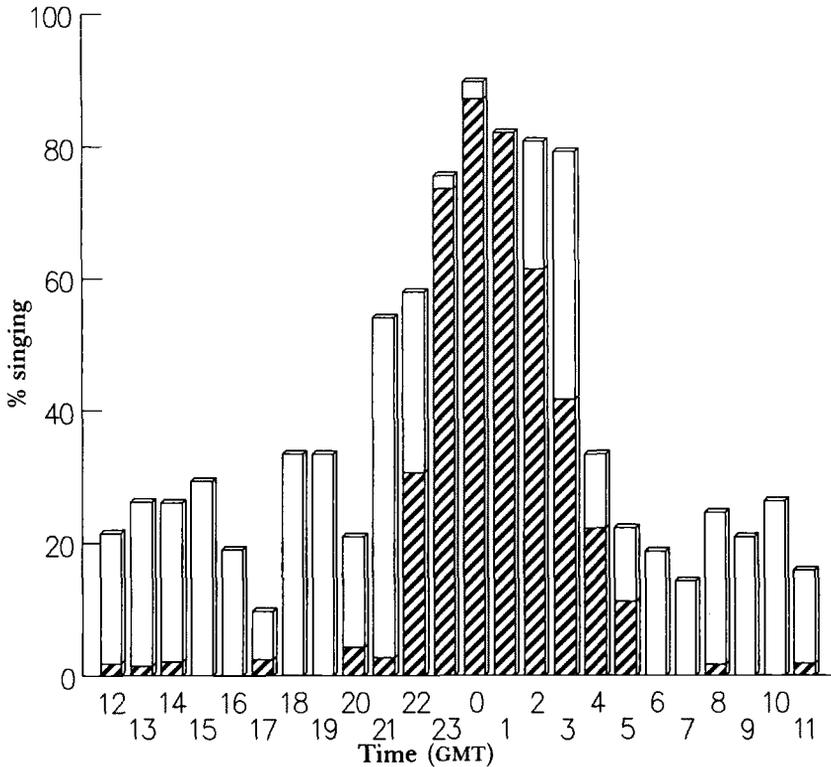


Fig. 1. Percentage frequency of singing of nine radio-tagged Corncrakes *Crex crex*. Shaded area represents continuous singing, the unshaded sporadic singing (see text for details)

their radios by then. From mid July onwards, we rarely heard any which had lost their radios (indicating that singing had stopped and/or they had moved away). Census work in the Uists (Stowe & Tonkin 1985) and in Sweden (Alnäs 1974) has also demonstrated a reduction in the amount of singing from mid July (see also Mason 1940; Cramp & Simmons 1980).

Thus, the census period was designated as 20th May until 10th July 1988, and censuses were conducted between 23.00 and 02.00 GMT where possible. Records outside this period were included only from localities where no night-time survey work was possible, or where records of females with flightless young were received from areas where no males had been recorded singing.

*Census organisation*

To increase the likelihood of detecting Corncrakes, observers were asked to survey their area twice, where possible. As individuals may move during the season, the second visit was required within one or two weeks of the first, to reduce the possibility of duplication. Survey effort was concentrated on Scottish islands, where most Corncrakes were known to occur, and in areas of the mainland where Corncrakes were recorded in the 1978-79 survey. In areas where Corncrakes had been present in 1978-

79, but where it was doubtful that they still occurred, the principal recorders (AVH & SJA) used tape-recorders under licence from the Nature Conservancy Council to try to stimulate singing. To obtain maximum coverage, an appeal for volunteers was published in *BTO News*, relevant County Bird Recorders were contacted, and publicity was organised throughout northern Scotland.

## Results

### *Coverage*

Census cards were returned for 175 10-km squares, 163 of which were in Scotland (150 10-km squares in Scotland held Corncrakes in 1978-79). All 10-km squares in north and west Scotland, including the islands, which held Corncrakes in the previous survey were visited, mainly by AVH and SJA. On islands such as Lewis and Skye and on mainland Scotland, where apparently suitable habitat for breeding Corncrakes is scattered widely, a few may have been missed. As most recorded from isolated areas were reported from more than one source, however, and many reports were received from the public, we doubt that many were overlooked. Elsewhere, where Corncrakes were already known to be far fewer than in 1978-79, the survey relied more on volunteer observers and information sent in by County Recorders. As a check on census efficiency, the organisers of the BTO's Breeding Bird Atlas were contacted. Only one extra record was gained from this source.

105. Corncrake *Crex crex*, Co. Galway, May 1978 (*Richard T. Mills*)



*Status and distribution of Corncrakes in 1988*

The British Corncrake population was estimated as 551-596 singing birds in 1988, the majority in Scotland (table 1). The range in numbers is due either to observers being unable to determine exactly how many were present, or to different observers in the same area giving imprecise details of date or location such that duplication may have occurred. More than half the total (54%) was recorded in the Outer Hebrides (Western Isles) (300-324 singing individuals, table 1), of which almost one third occurred in South Uist. The Inner Hebrides, particularly Tiree, also held important concentrations (table 1). In Orkney, records were scattered throughout 14 islands. In mainland Scotland, eight Corncrakes were heard in west Sutherland, but only a few were recorded elsewhere and these were from widely scattered localities. Singles were heard in Shetland and in the Isle of Man. Only four were reported in England.

Ninety-four per cent of singing Corncrakes occurred in seven 100-km grid squares, and 38% occurred in one square alone (NF, covering the Uists and Benbecula). There were 90 10-km squares definitely or probably occupied, and a further 15 possibly occupied (fig. 2). Eleven 10-km squares each held 15 or more singing Corncrakes in 1988, and together they supported 55% of the British population. These squares were in North Uist, South Uist, Benbecula, Barra and Tiree (fig. 2).

*Changes in numbers and range*

The number of singing Corncrakes declined by 15-26% between the 1978-79 and 1988 surveys (table 1, figs. 2 & 3). The largest decreases occurred in mainland Scotland (67-77%), in Orkney (65-72%) and in England (64-76%). In the Inner Hebrides, a decrease of 14-21% occurred, whereas there was an apparent 12-25% increase in the Outer Hebrides (Western Isles).

The most probable explanation for the apparent increase in the Outer Hebrides is that the 1978-79 survey underestimated numbers. By comparison, more observers were deployed in June 1988 than had been possible ten years before, and more local people participated in areas where suitable habitat was scattered widely (e.g. Lewis, Skye). Also, the 1978-79 survey did not have the benefit of the results of radio-telemetry study, and some areas were surveyed during the day, which would have produced lower totals, especially in areas of high Corncrake density. On Barra, for example, numbers were almost certainly underestimated in the previous survey because counts were made in the early evening (Dr J. Robarts verbally). Finally, many areas could be surveyed only once in 1978-79.

The number of occupied 10-km squares decreased by 43% between 1978-79 and 1988, and by 83% between 1968-72 and 1988 (table 2, figs. 2 & 3). Outside the Hebrides, decreases have been especially severe, with 60-100% of occupied squares deserted since 1968-72 (table 2). Even in the Outer Hebrides, the number of occupied 10-km squares decreased, despite the improved survey effort and greater number of individuals recorded. The contraction in range in Scotland has continued, particularly at the eastern and northern edges (figs. 2 & 3).

**Table 1. Numbers of singing Corncrakes *Crex crex* in regions of Britain in 1978-79 (Cadbury 1980) and in 1988, and percentage change**

\*Clyde islands are included in Scottish Mainland; †=1977 count; % change calculated only where more than 10 individuals present in 1979-79

Region	Island/county/ district	Totals in 1978-79	Totals in 1988	% change	
Shetland	Mainland	3-5	1	-67% to -80%	
	Orkney	Papa Westray	6		0-1
Orkney	North Ronaldsay	5	0		
	Westray	11-12	3		
	Sanday	6	1		
	Eday	2	0-1		
	Egilsay	1	1-2		
	Rousay	1	1-2		
	Wyre	1	1		
	Stronsay	6	3		
	Mainland	38	7-8		
	Shapinsay	5	2-3		
	Graemsay	3	0-1		
	Hoy	4	0		
	Copinsay	1	0		
	Flotta	4	1		
	South Walls	2	0		
	Burray	1-2	1		
	South Ronaldsay	5-6	8		
		TOTAL	102-105	29-36	-65% to -72%
	Outer Hebrides	Lewis	31-38	66-76	
Harris		7	5		
Berneray		5	1-2		
North Uist		75	56-59		
Benbecula		33	22-23		
South Uist		83	91-100		
Barra		23-25	56		
Vatersay		3	3		
	TOTAL	260-269	300-324	+12% to +25%	
Inner Hebrides	Skye	31-34	26-28		
	Canna	9	1-2		
	Rhum	1-2	0		
	Eigg	4-6	0		
	Muck	4	0		
	Coll	28	20		
	Tiree	85	99-103		
	Mull	1	2-3		
	Iona	25†	3		
	Lunga	1	0		
	Colonsay	20	14-15		
	Oronsay	2	3		
	Islay	22-24	19		
Jura	1	1			
Gigha	1	4			
	TOTAL	235-243	192-201	-14% to -21%	
Scottish Mainland*	Caithness	4	2		
	West Sutherland	38-40	8		
	East Sutherland	0	2		
	Wester Ross	3	2		
	Easter Ross	3	0		

Region	Island/country/ district	Totals in 1978-79	Totals in 1988	% change
Scottish Mainland* (contd.)	E Inverness-shire	2	0	
	W Inverness-shire	2	0-1	
	Argyllshire	12	4-5	
	Perthshire	3	1	
	Stirlingshire	1	1-3	
	Island of Bute	1-2	0	
	Arran	3	3-4	
	Renfrewshire	1	0	
	Ayrshire	8-11	1	
	Wigtownshire	0-7	0	
	Kirkcudbrightshire	5-6	0	
	Dumfriesshire	1-2	0	
Roxburghshire	1	0		
	TOTAL	88-103	24-29	-67% to -77%
England	Northumberland	3	0	
	Cumberland	4	2	
	Durham	0-1	0	
	North Yorkshire	1	0	
	Staffordshire	0-1	0	
	Warwickshire	1-2	0	
	Norfolk	0-1	0	
	Somerset	1-2	0	
	Dorset	1-2	0	
	Bedfordshire	0	1	
Lancashire	0	1		
	TOTAL	11-17	4	-64% to -76%
Isle of Man	Isle of Man	0-3	1	
Wales	Caernarvonshire	1	0	
TOTAL		700-746	551-596	-15% to -26%

The range changes have led to a change in the relative importance of each region for Corncrakes. Orkney now holds only 5-6% of the British total, compared with 15% in 1978-79, while the proportion on the Scottish mainland has decreased from 12% to 4-5%. West Sutherland remains the most important area in mainland Scotland. The proportion located in the Inner Hebrides has remained similar between surveys (34%-35%), although the numbers have decreased. The Outer Hebrides now support 54% of the population, compared with 36% in 1978-79.

### Discussion

Corncrakes are difficult to count accurately because of their skulking behaviour and the timing and frequency of their singing. Singles away from concentrations of others may sing less frequently (Cadbury 1980). In addition to such variations resulting from detectability, numbers appear to fluctuate annually both on the periphery of their range, where individuals turn up in places not usually occupied, and within the strongholds (e.g. Sharrock 1976; Cramp & Simmons 1980; this study). For example, in the Uists and Benbecula, 191 singing Corncrakes were recorded in 1978 (Cadbury 1980), 167 in 1983 (Henderson 1983) and 169-

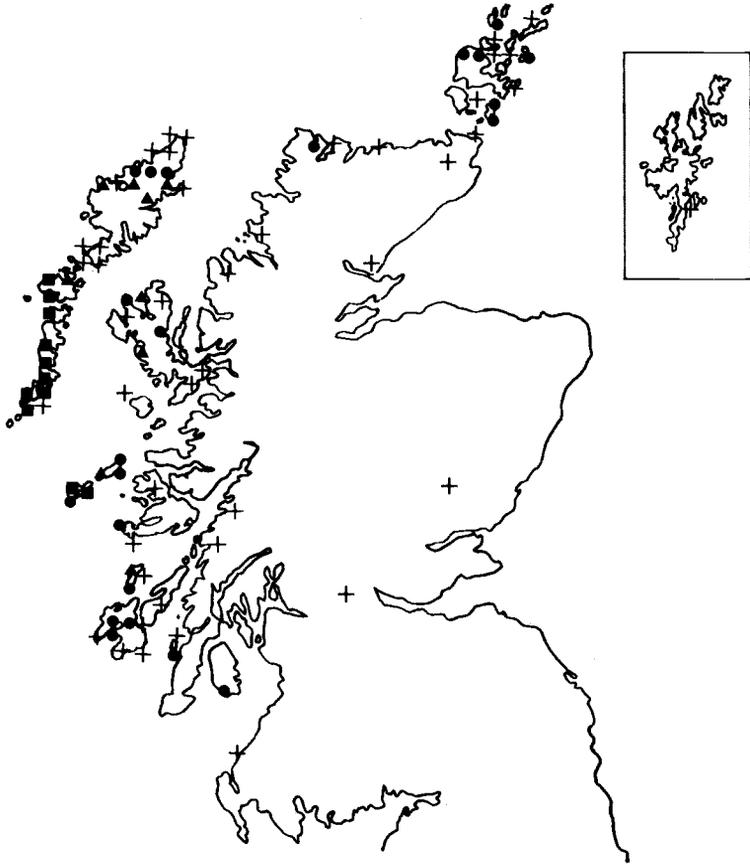


Fig. 2. Distribution and numbers of Corncrakes *Crex crex* in 1988

- |   |                              |   |                                     |
|---|------------------------------|---|-------------------------------------|
| + | 1-2 singing per 10-km square | ▲ | 7-14 singing per 10-km square       |
| ● | 3-6 singing per 10-km square | ■ | 15 or more singing per 10-km square |

182 in 1988. On Canna, numbers fluctuated between seven in 1969 and 1970 and 15 in 1980, but had dropped to two in 1984 and 1985 (Swann 1986). On Islay, numbers during 1978-88 fluctuated between 19 and 29 singing (Stroud 1986; this study). On Colonsay, numbers decreased from 20 in 1978 to between two and six from 1981 to 1986, but increased to eight in 1987 and 14-15 in 1988 (J. Clarke *in litt.*). Although some of the recent increase on Colonsay may be attributed to greater observer effort, lower numbers were undoubtedly present in the mid 1980s.

Although annual variations make single-year estimates less reliable as indicators of population size and trends, the long-term trend is still convincingly downward. The total numbers of singing Corncrakes recorded in 1988 were 15-26% lower than in the last survey, in 1978-79. The real decrease may be somewhat greater, as improved coverage was secured in 1988 in some areas, particularly in the Western Isles. The

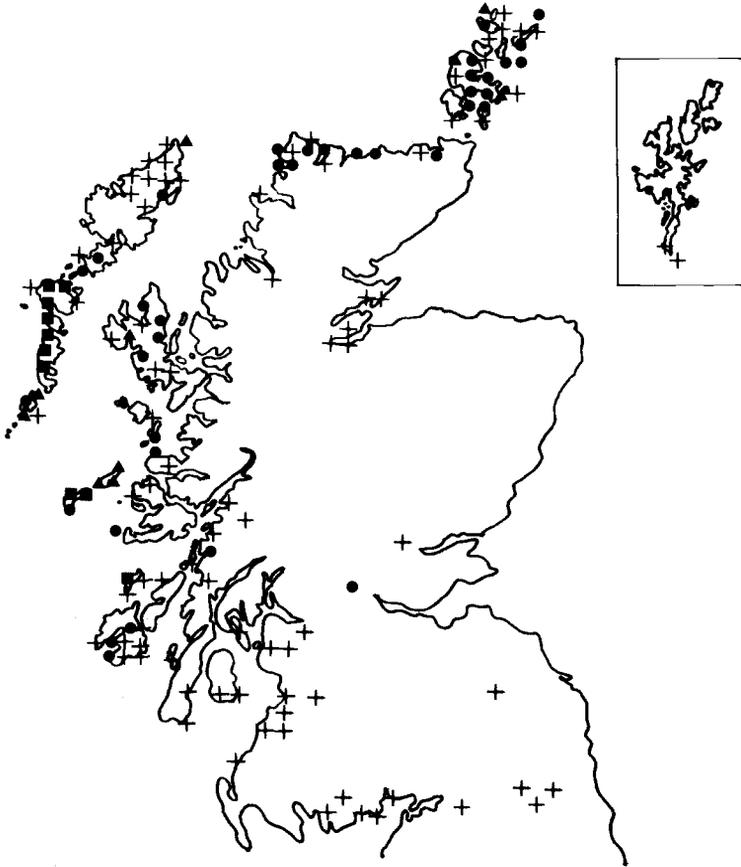


Fig. 3. Distribution and numbers of Corncrakes *Crex crex* in 1978-79 (Cadbury 1980)  
 + 1-2 singing per 10-km square                      ▲ 7-14 singing per 10-km square  
 ● 3-6 singing per 10-km square                      ■ 15 or more singing per 10-km square

Corncrake's British range is continuing to contract to the northwest. Only five singing Corncrakes were recorded outside Scotland, and very few occurred in the east of Scotland. Even in the Northern Isles, few remained, with only one recorded in Shetland in 1988 (where there were only three to five in 1978-79), and numbers are declining rapidly in Orkney.

A repeat census of the Irish Corncrake population, carried out at the same time as the British census and using the same methods, revealed a total of 903-930 singing (Mayes & Stowe in press). This represents a decline of about 30% compared with the population estimated in 1978 (about 1,500 individuals, O'Meara 1979), but the decline has not been as severe as suggested by O'Meara (1986). As in Britain, numbers apparently increased in a few counties, owing to improved census techniques, but in general a marked decline was evident. The range has also continued to contract, with Corncrakes found in 210 10-km squares, compared with 373

**Table 2. Numbers of 10-km squares definitely and probably occupied by Corncrakes *Crex crex* in 1968-72 (Sharrock 1976), 1978-79 (Cadbury 1980) and 1988, and percentage change**

Figures in brackets indicate percentages based on sample sizes of less than 10 in the earlier surveys

	NUMBER OF 10-KM SQUARES OCCUPIED IN			% DECREASE IN OCCUPIED 10-KM SQUARES SINCE	
	1968-72	1978-79	1988	1968	1978
Shetland	9	2	1	(89)	(50)
Orkney	30	27	12	60	56
Inner Hebrides	54	36	31	43	14
Outer Hebrides	32	31	29	9	6
Rest of Scotland	216	54	14	94	74
SCOTLAND TOTAL	341	150	87	74	43
England	133	9	3	98	(67)
Wales	42	1	0	100	(100)
Isle of Man	12	0	1	92	—
TOTAL	528	160	91	83	43

in 1978, and again the contraction has been to the north and west (Mayes & Stowe in press).

The present population of Corncrakes in Britain, at 551-596 singing individuals, is low, but represents an important component of the Western European breeding population (table 3). There have been national surveys of Corncrakes in several European countries (e.g. France, Norway), although these have not been as intensive as the present studies in Britain and Ireland. Other census information has been provided by Atlas studies (e.g. Belgium). The population estimates vary in accuracy, and the range in the estimate of Corncrakes for some countries is rather large (table 3). For the Netherlands, the range represents the minimum and maximum numbers between years (Osieck 1986), since the population exhibits large fluctuations. Large fluctuations were also reported for Belgium, where the increase from 25 pairs (Lippens & Wille 1972) to at least 38 singing in 1984 was probably due to greater census effort. In Spain, a report of a recently discovered population of 150 pairs in irrigated cereal fields (Chacon *et al.* 1987) is now considered in need of confirmation (de Juana 1988; E. de Juana *in litt.*). In the absence of more reliable or up-to-date information, the figures in table 3 provide an estimate of approximately 6,000 calling Corncrakes in Western Europe. France is now the single most important country, supporting approximately one third of the Western European population, whilst Britain and Ireland combined support about 24%. Clearly there is an international responsibility to maintain the British and Irish Corncrake populations, and British and Irish birdwatchers can play their part. The understandable enthusiasm to catch a glimpse of this remarkable species must be tempered by the need to avoid disturbance of breeding birds and their habitats.

Detailed information about Corncrake numbers is lacking for most of Eastern Europe and the Soviet Union. Historically, declines have been reported from East Germany, Czechoslovakia, Hungary, Bulgaria and

**Table 3. Recent population estimates for Corncrakes *Crex crex* in Europe**

For Western Europe, percentages are calculated using the mid value of the estimates of each country (except for France, where the figure of 2,000 is used: Broyer 1987) and the total of those estimates (6,140). For Eastern Europe, the populations are less well known and coverage is incomplete

Country	No. of singing males	% of total	Trend	Source
Norway	100-200	2.4	Decreasing, range contracting	Roalkvam (1984)
Sweden	500-1,000	12.2	Stable or slight increase	T. Tyrberg <i>in litt.</i>
Finland	600	9.8	Stable	Koskimies (1989), E Lammi <i>in litt.</i>
Denmark	10-30	0.3	No recent information	Cramp & Simmons (1980)
West Germany	350-1,300	13.4	Decline continuing	P. Herkenrath <i>in litt.</i>
Britain	551-596	9.3	15%-26% decrease since 1978-79	D. Hashmi <i>in litt.</i>
Ireland	903-930	14.9	c. 30% decrease since 1978	Present study
Netherlands	150-360	4.2	No decline in last decade	Mayes & Stowe <i>in press</i>
Belgium	38	0.6	Declining, but see text	Osieck (1986); Voslamber verbally
Luxembourg	<10	<0.2	Evidence for recent decline	Devillers <i>et al.</i> (1988)
France	1,750-2,450	32.6	Decline continuing	J. Weiss <i>in litt.</i> , Melchior <i>et al.</i> (1987)
Switzerland	1-3	<0.1	Declining, almost disappeared	Broyer (1985, 1987)
Spain	none confirmed	—	See text for details	Schmid (1989)
<hr/>				
WEST EUROPEAN TOTAL	4,963-7,517	100		
<hr/>				
Poland	4,000-5,000		Probably declining	E. de Juana <i>in litt.</i>
East Germany	150		Declining	P. Cempulik verbally
Austria	260-813		Continuing long-term decline	A. Stiefel verbally
Hungary	500-1,000		Believed to be stable	M. Dvorak verbally
Yugoslavia	1,000-1,500		Trend unknown	T. Szep verbally
				M. Schneider-Jacoby <i>in litt.</i>

**106. Corncrake *Crex crex*, Co. Cork, June 1980 (Richard T. Mills)**





107. Corncrake *Crex crex*, Co. Galway, May 1978 (Richard T. Mills)

parts of western USSR (Cramp & Simmons 1980) and these are known to be continuing in Austria and East Germany (table 3). In Poland, where Corncrakes are locally common in the east but have decreased in the west (Cadbury & O'Meara 1985), the population is estimated to be 4,000-5,000 singing birds. These are concentrated in three main areas, of which the most important, the Biebrza Marshes, holds about 2,100 singing birds (P. Cempulik verbally). The main breeding areas of the Soviet Union, where the Corncrake's range extends to 120°E, are sparsely populated by human beings and the natural habitats are relatively undisturbed (V. Ilyichev *in litt.*). There, the Corncrake population is believed to be stable, whereas in areas with higher densities of people and more developed industry and agriculture (e.g. the central European part of USSR, the Ukraine, and the Volga region) the numbers of Corncrakes are gradually decreasing (V. Ilyichev *in litt.*).

Earlier this century in Western Europe, the decrease in Corncrake numbers followed closely the route of agricultural modernisation and mechanisation, which spread north and west from the southeast of England. Changing farming methods were widely believed to be causing the decline of the Corncrake (Norris 1945, 1947; von Haartman 1958; Cadbury 1980; Cramp & Simmons 1980; Broyer 1985). The 1988 survey has indicated that this contraction of range is still taking place, and at an alarmingly fast rate. Combining all areas except the Hebrides, the numbers of singing Corncrakes recorded have decreased by 72% in ten years. This represents an annual loss of 13.33%. If this rate of loss were to continue, numbers of Corncrakes (at present numbering only 59 singing

males in these areas) would halve again within five years. The reasons for the continuing decline of the Corncrake are complex and are discussed elsewhere (Hudson *et al.* in prep.). We can only reiterate Cadbury's (1980) conclusion that the future for the Corncrake looks bleak.

### **Acknowledgments**

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### **Summary**

The long history of decline in the British population of Corncrakes *Crex crex* has continued in the last decade. The population was estimated in 1988 to be 551-596 singing individuals, a maximum decline of 26% and minimum decline of 15% since the previous estimate of 700-746 singing in 1978-79. The decrease has not been uniform across its 1978-79 range in Britain, with the strongholds in the Hebrides least affected. The Corncrake is now absent from Wales, rare in England, the Isle of Man and Shetland, and scarce and declining at an

108. Corncrake *Crex crex*, Co. Cork, July 1979 (*Richard T. Mills*)



alarming rate in mainland Scotland and in Orkney. The Inner and Outer Hebrides now support approximately 90% of the British Corncrake population.

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