

2. The Global Status of the Corncrake

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The corncrake *Crex crex* is among 1,186 bird species (about 10% of all species) recently assessed as being globally threatened. Corncrake population declines are well documented in western Europe, but until recently little was known about populations and trends elsewhere in Europe and Asia. In the last five years, in fulfilment of the European Corncrake Species Action Plan, the RSPB has funded corncrake population surveys in several Central and Eastern European countries to fill this gap. The results show that there are many more corncrakes in eastern Europe than ornithologists in those countries once thought, but long-term trends are still unclear. The recent history of corncrake populations in western Europe shows that they are unusually sensitive to both agricultural intensification and abandonment. Economic and agricultural upheavals are continuing in many former eastern bloc countries and it is difficult to predict the rate of agricultural development there, even in the short term. Hence, their large corncrake

The long-term decline in the population and range of the corncrake in Britain is one of the best known bird population declines, both because it began more than 100 years ago and because the corncrake quickly changed from being a widespread species, familiar to many people, to one which is now restricted to a few remote places (Norris, 1947). The reasons for the corncrake's decline and the recent conservation programmes aimed at arresting and reversing it were described in a previous article in *Conservation Review* (Williams *et al*, 1997). Corncrake declines have also been reported in many other European countries (Green *et al*, 1997). For this reason it is included among the 1,186 bird species (about 10% of the world's birds) that are currently consid-

ered to be globally threatened (BirdLife International, 2000).

Six years ago very little was known about the global population of the corncrake because there were only educated guesses about the populations in several countries in Eastern Europe and Asia that were thought to hold the largest breeding populations (Tucker and Heath, 1994). This lack of information is not surprising because there are few ornithologists in these countries relative to their area and because the corncrake is more widespread, numerous and hence more difficult to count there than in Western Europe. In 1994, the development of a European Action Plan for corncrake conservation brought this lack of informa-

tion into clear focus. Since then there has been considerable progress in producing a clearer picture of the global status of the corncrake.

The approach – international co-operation on corncrake research, survey and conservation

The first international meeting on corncrakes was organised by the ornithological organisation, *Landesbund für Vogelschutz im Bayern (LBV)* and held in November 1989 in Munich at the suggestion of the International Council for Bird Preservation, the forerunner of BirdLife International. The meeting's main purpose was to compile what was known about the biology and conservation status of the corncrake. The results were published in the journal *Vogelwelt* (Flade, 1991). It became clear that much more information was required on many aspects of corncrake population biology and ecology, but it was also evident that research and survey work on corncrakes is more difficult than for most other birds. Corncrakes are secretive and remain concealed in tall vegetation throughout the year. Their hidden nests are very difficult to locate. The only practical way to assess their abundance is to count the singing males during the breeding season, but they only sing regularly at night, so cannot be surveyed adequately by methods suitable for most other bird species. Females and young are only rarely seen, so it is not feasible to assess the numbers of females or to estimate the numbers of young they rear. The RSPB's pioneering radio-tracking studies of corncrakes in the Western Isles of Scotland (Stowe and Hudson, 1991) were beginning to throw

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Corncrake habitat: rich meadowland mowed late in the season

Box 1: The Corncrake Conservation Team

BirdLife International is currently helping to create 'Species Conservation Teams' for all globally threatened birds in Europe. These teams are an informal collection of experts in all the range countries of the single species. The main aim of the Species Conservation Teams is to co-ordinate the implementation of the BirdLife International Species Action Plans. Part of these plans are to initiate new projects. Information will be shared between the members of the Species Conservation Teams by regular meetings (about every two years) and a newsletter or a home page. The Corncrake Conservation Team was founded during the International Corncrake Workshop (Hilpoltstein, 11 – 15 September 1998). It is chaired by Norbert Schäffer (RSPB) and Ubbo Mammen (LBV), and funded by the RSPB, BirdLife Partner in the UK. The main project of the Corncrake Conservation Team in the years to come is the development and implementation of Europe-wide corncrake monitoring. The aim is to watch changes in global population trends carefully in order to be able to act if necessary. A very important way of keeping contact between the members of the Corncrake Conservation Team is the internet. The RSPB and LBV worked together in setting up an internet page on corncrakes – <http://www.corncrake.net>

light on the breeding biology and habitat selection of corncrakes, but the results were based upon small samples of birds in only two study areas.

By 1994 the Earth Summit in Rio de Janeiro had given much greater prominence to the need to have hard facts about the status of threatened species and the International Union for the Conservation of Nature (IUCN) was in the process of producing new assessments of the conservation status of animals and plants. BirdLife International, with financial support from the RSPB and the European Union (EU) LIFE Programme, organised a workshop of European corncrake experts at Gdansk, Poland in 1994. The workshop developed a Europe-wide conservation programme, the *Action Plan for the Corncrake in Europe* (Crockford *et al*, 1996). This summarised the knowledge of the population trends, biology and ecology of corncrakes. It also identified threats and suggested conservation action which was prioritised country by country. The action plan was adopted by the European Commission and the Council of Europe (Bern Convention) in 1996 and is regarded as the central guideline and catalyst for the conservation of the corncrake. Several projects prioritised in the action plan have been funded via the EU LIFE Programme. One of the main priorities was to find out more about the population size of corncrakes in central and eastern European countries for which there were no formal estimates.

This led to the funding by the RSPB of corncrake surveys in Russia, Poland, Latvia, Bulgaria and Romania in the years 1995 to 1997.

In 1995, a second international corncrake symposium was organised in Freising, Germany by LBV to summarise progress with research. It produced an updated compendium of scientific papers on corncrakes (Green *et al*, 1997). A further meeting was held at Hilpoltstein, Germany in 1998 to review the improved information available from the new population surveys. In addition, a Corncrake Conservation Team was founded (see box) and a website set up to disseminate research results (<http://www.lbv.de/crex>).

Making the first formal estimate of the corncrake population of European Russia

The first of the RSPB-funded corncrake surveys in Eastern Europe was the most daunting. Estimating the corncrake population of a huge country such as European Russia is not easy. Not only is the area to be sampled very large, but many areas are difficult to get to and distant from the nearest ornithologists. The Russian Bird Conservation Union (RBCU, BirdLife Partner-designate in Russia) carried out surveys in regions roughly equivalent to UK counties which were selected to be representative of a group of ecologically similar, adjacent

regions (Mischenko *et al*, 1997). Survey plots were selected at random within areas that could potentially hold corncrakes. Each plot was visited by day to survey the types of farmland and other habitats present and to plan a survey route. The survey route was subsequently walked at night and the locations of singing male corncrakes plotted. The loud rasping *crek-crek* call of the male corncrake dominates the nocturnal soundscape in those areas of Scotland and Ireland where they are still found. In contrast, the Russian researchers had to listen carefully to pick out the corncrakes against a huge volume of sound produced by thrush nightingales *Luscinia luscinia* and river warblers *Locustella fluvialis* in some of the study plots.

The survey work was carried out in 1995 and 1996, mainly in June, by up to nine teams of two ornithologists. About 2,000 square kilometres were surveyed in eighteen regions and 5,428 singing male corncrakes were counted. The sample plot results were extrapolated to cover the entire country. The surveyors were able to use information from a very detailed 'land balance' – a set of statistics on the distribution and extent of different habitats, including various types of grassland, which covered all former Soviet Union countries. A typical category was 'wet unimproved hay/silage meadow with shrubs'. The ornithologists recorded the land balance category in which each singing corncrake was located. Population estimates for the whole country were obtained by calculating the average density of corncrakes in each land balance category within a region, and multiplying by the area of the category in that region and similar neighbouring regions. This gave an estimate of between one and one and a half million singing male corncrakes in the whole of European Russia – ten to fifteen times the 'educated guess' available in 1994. Corncrakes had not increased by this amount; it was simply that a formal estimate had replaced a guess.

The new picture of the world population

Similar methods have since been used to estimate corncrake populations in other Eastern European countries. In Latvia, the survey was organised by Oskars Keiss, Latvian Fund for Nature in co-

Table 1. Estimated numbers of singing male corncrakes in three recent compilations of information from the world breeding range. The bracketed figures in the first column are those estimates based on no quantitative data and which were considered unreliable at the time. Estimates based upon detailed surveys are shown in bold. The other estimates were based upon incomplete or unsatisfactory quantitative information. Countries in which the RSPB funded surveys in 1995 – 1998 are marked by asterisks.

	Tucker & Heath (1994)	Gdansk Workshop (1994) <i>(Green et al., 1997)</i>	Hilpoltstein Workshop (1998)
Albania	no data	no data	< 20 ?
Austria	400-600	140-180	150-300
Belarus	55,000-60,000	26,000-30,000	26,000-30,000
Belgium	10-45	17-21	between 5 and > 60
Bosnia-Herzegovina	no data	300-1,000	no data
Bulgaria	(100-1,000)	1,000-2,500	2,000-8,000*
Croatia	250-300	400-1,000	no data
Czech Republic	200-400	200-400	600-1,600 (1997:1,500)
Denmark	6	6	10-200
Estonia	5,000	5,000	10,000-18,000
Finland	500-1,000	500-1,000	500-1,000
France	1,050-1,150	1,100-1,200	1,200-1,400
Georgia	no data	no data	no data
Germany	(260)	800	1200-3000
Hungary	300-500	350-450	400-1100 (1997: 740, 1998: 1000-1100)
Ireland	174	165	150-180
Italy	(100-500)	250-300	no data
Kazakhstan	no data	no data	no data
Latvia	3,000-10,000	26,000-38,000	26,000-38,000*
Liechtenstein	2-4	8	0-4 (1995: 3, 1996: 2, 1997: 1, 1998: 0)
Lithuania	2,000-3,000	3,000-4,000	25,000-30,000
Luxembourg	0-10	<10	0-6
Macedonia	-	-	no data
Moldova	700-1,100	450	100-250
Mongolia	no data	no data	5
Netherlands	50-150	50-150	1990-96: 50-100, 1997: 250, 1998: 500-550
Norway	50-100	15-35	50-75
Poland	6,600-7,800	6,600-7,800	1997: 30,000*
Romania	(3,000-6,000)	3,000-6,000	10,000-20,000*
Russia (European)	(10,000-100,000)	1,000,000	1,000,000-1,540,000*
Russia (Asian)	no data	no data	515,000 – 1,000,000
Slovakia	600-900	600-900	1,400-1,700
Slovenia	(200-300)	>500	510
Spain	4-13	24-31	no data
Sweden	250-1,000	250-1,000	400-800
Switzerland	1-13	4	0-10
Turkey	0-10	no data	25-100
Ukraine	2,000-2,500	25,000-55,000	25,000-55,000
United Kingdom	487	489	591

operation with *Latvijas Ornitologijas Biedriba* (LOB, Latvian Ornithological Society), the BirdLife Partner-designate in Latvia. In Poland, there was already information available about the distribution of corncrakes in the Breeding Bird Atlas of Poland. Using this knowledge, sample plots were randomly selected separately in regions where the presence of corncrakes had already been documented and those where it had not. The survey fieldwork was then carried out by *Ogólnopolskie Towarzystwo Ochrony Ptaków* (OTOP, BirdLife Partner-designate in Poland). For the calculation of the national population of Poland, both categories of sample plots were analysed independently and the totals added together. In Bulgaria and Romania, the corncrake populations were known to be smaller and more fragmented than in Russia or Latvia, so sample plots were selected only in areas and habitats where the presence of corncrakes was likely.

The effects of the new studies on the development of our knowledge of the world population of corncrakes is shown in Table 1. Whilst estimates of the corncrake populations of many countries are still unavailable or are based upon incomplete information, there has been considerable progress in narrowing the range of

uncertainty. The numbers of singing males in all of the countries where new systematic surveys have been carried out are much larger than was previously thought, particularly for Russia. It appears that the total world population of singing male corncrakes is likely to be in the range of 1.7 – 3 million birds.

This new information is an improvement, but it is still unsatisfactorily vague. The participants in the 2nd International Corncrake Workshop at Hilpoltstein (September 1998) identified the following countries as priorities for further surveys, ranked from highest to lowest priority: the Siberian part of Russia, Moldova, Romania, Croatia, Bosnia-Herzegovina and Serbia.

What happened to corncrakes in Western Europe?

Corncrakes are largely dependent on habitats managed by farmers in Western Europe, especially hay and silage meadows. Numbers declined rapidly after the introduction of mechanised hay mowing (Norris, 1947). Machine mowing led to increased destruction of corncrake nests and chicks because it resulted in larger areas of hay or silage being mowed in one

session than was previously possible by hand. Mechanised mowing usually proceeds from the outside of the field inwards. Virtually all nests in mowed meadows are destroyed. Adults and chicks tend to run away from the mower into uncut grass. Fully-winged adults and grown young can fly out of the grass when close to the mower, but flightless chicks, which are reluctant to break cover, are often killed as the mower cuts the last few swaths in the centre of the field. Chicks which attempt to escape by crossing the open, already mowed area of the field may be taken by predators such as gulls. Further, because it is more rapid, mechanised mowing allows the whole hay or silage harvest to be completed earlier in the summer. Hence, fields which would have been mowed in late summer if mowing was done by hand are harvested earlier, within the breeding period of the corncrake, so a greater proportion of nests and broods are destroyed.

In Britain the replacement of horses by tractors, and improved land drainage which allowed the early mowing of meadows in river floodplains that had formerly been too wet, continued these trends into the late 20th century. Even the further improvements in the power and



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Corncrake habitat in eastern Europe: invasion of neglected meadows by bushes is an increasing problem

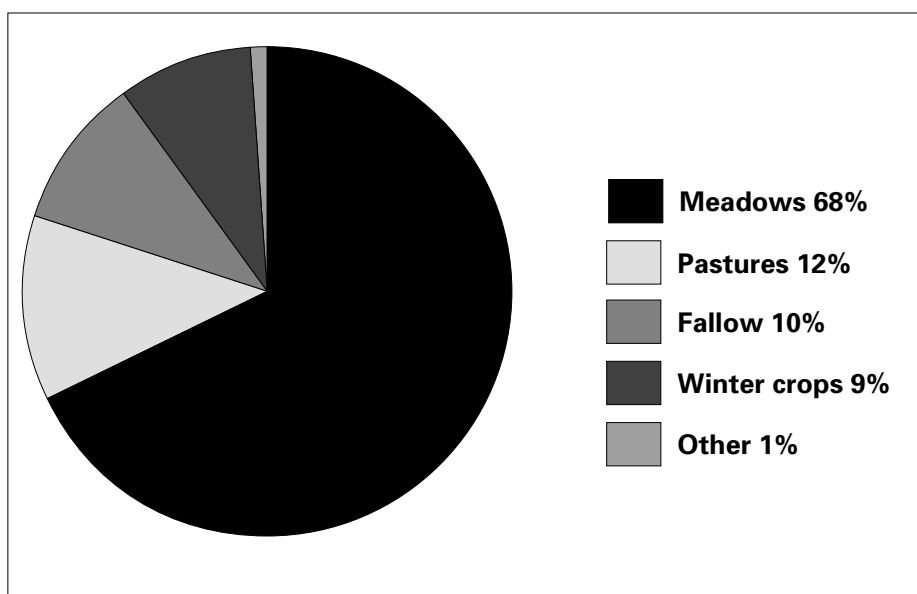
speed of machinery from the 1950s onwards led to a 50% decline in the duration of the time required to harvest the hay crop, though mowing machines and tractors had long been in use by then. In addition to these changes in mowing methods, there have been reductions in the area of suitable habitat for corncrakes. The nature of these changes varies considerably among countries. In parts of Scotland, reductions in the area of hay and silage grown have accompanied decreases in numbers of cattle and increases in sheep leading to a loss of tall grass meadows. In France, meadows have been converted to maize fields and poplar plantations.

Prospects for corncrake populations in Eastern Europe

The corncrake populations of Eastern European countries are much larger than was previously thought, but this in itself is not a reason to think that their future is any more secure. Even with the information available in 1994, it was clear that the corncrake was a widespread and numerous bird, with a world population of at least hundreds of thousands of singing males. The new population estimates for countries where there was no previous reliable formal estimate do not tell us anything new about population trends, although they provide a foundation for assessing trends in the future because the surveys can be repeated in exactly the same way. The reason that the corncrake is listed as globally threatened is not rarity, but the history of large and rapid population declines in many countries and the prospect that these could happen elsewhere. So how likely is it that the large corncrake populations in eastern Europe will decline rapidly in future?

A striking finding of the new surveys has been the quantitative breakdown they provide of the habitats occupied by corncrakes in Eastern Europe. An example from the recent survey of corncrakes in Latvia is shown in Figure 1. The majority of corncrakes in Latvia breed in grasslands mowed for hay or silage, or managed in some other way by farmers. This was also found to be the case in Russia, where hay and silage meadows in river floodplains were found to be of particular importance. A similar situation is found in other Eastern European countries. Before humans changed the land-

Figure 1: Proportion of singing male corncrakes recorded in different land use types in Latvia. Data are from Table 1 of Keiss (1997).



scape of Europe so drastically, much of it was covered by forests which were unsuitable for corncrakes. The original breeding habitats were riverside meadows of grass and sedges and subarctic, alpine, coastal and steppe grasslands with scattered trees and bushes. Unbroken tree cover in these areas was prevented by climatic conditions, flooding, ice-rafting, fire or grazing by deer and wild cattle. These habitats and the large-scale ecosystem processes that created or maintained them have disappeared or diminished in most of Europe, though they remain important for corncrakes in some areas, especially Siberia. Hence, in much of its world range the corncrake breeds predominantly in habitats created and managed by farmers, as in Western Europe. Is there reason to doubt that these habitats will remain suitable for them?

Until the collapse of Communism, the development of agriculture in the Eastern bloc countries of Europe was very different from that in Western Europe. Agriculture became mechanised, but workers on large collective farms did not receive material benefits for producing more and exploiting every available piece of land. Although many fields were managed intensively, those in places that were difficult to work or to get to, such as marshy fields remote from the farm settlement, were not. Some large parts of the grassland were not cut or grazed in some

years or cut very late. As a result of the mismanagement (from an economic point of view) of large meadows, vegetation cover was undisturbed in parts of the meadows all spring and summer, providing habitat for a reservoir of corncrakes that could breed successfully. Populations of corncrakes in formerly Communist countries are markedly larger relative to the area of the country than in Western Europe. These differences in population density between countries correlate with measures of the intensity of the agricultural system (Green and Rayment, 1996).

Drastic changes have occurred in the agricultural systems of former Eastern bloc countries since the collapse of Communism. It seems likely that the methods of grassland management described above will not exist for much longer. The changes in recent years have already been massive – surprisingly leading to an even better situation for corncrakes, at least in the short term. The political changes in almost all countries of the former Eastern bloc led to economic crises and to dramatic changes in the agricultural sector. In several countries of the former Soviet Union, for example Latvia and Estonia, privatisation of agricultural land has led to abandonment of large areas. For instance, in Latvia, according to our own data, about half of all meadows were abandoned in 1996. In Lithuania this is the case for about one third of all

meadows. In Russia the production of agrochemicals (including pesticides) was reduced from 215,566 t (100%; period 1986-1990) to 51,710 t in the period 1991-1995 (24%); in 1994 it was only 34,650 t and in 1995 only 29,011 t (Anon, 1996). Even more decisive is probably the shortage of fuel for mowing machines. Because of this, large areas have been mown late in the year or not at all, a situation which is extremely good for corncrakes.

However, even if the current economic situation persists, favourable changes in abandoned areas can only be temporary.

When mowing and grazing stop, old vegetation accumulates and bushes and trees cover the area. An example of this is the Biebrza National Park in north east Poland. A few decades ago, hay mowing was carried out by hand on a large percentage of the river valley. This method of grassland management does not exist any more and the area is being invaded by rank vegetation and bushes. Corncrake numbers have declined and are predicted to continue to do so according to projections of future vegetation change by botanists (Nau, 1998). Although methods are being discussed

which could influence the vegetation succession, a solution to the problem is not easy to find.

Although abandonment of agricultural land in the former Eastern bloc may continue, it seems far more likely that these countries will soon reform their agricultural policies so that agricultural development and intensification will begin in earnest. Several of the former Eastern bloc countries are in the process of applying to join the EU. The Common Agricultural Policy and the EU's Structural Funds, in whatever form they then exist, will be applied to these countries, along with conservation legislation such as the EU Birds and Habitats Directives. The net effect will probably speed up agricultural development which is likely to have unfavourable impacts on a widespread and dispersed species of agricultural land such as the corncrake, similar to trends already seen in Western European countries.

Will there be corncrakes in 2100?

The corncrake is listed in the least threatened ('Vulnerable') of the various categories of threatened birds (BirdLife International, 2000). This means that it is judged to have at least a 10% chance of becoming extinct within 100 years. During the listing process, BirdLife International consulted the Corncrake Conservation Team formed at the 1998 Corncrake Workshop. In addition to an intensive discussion at the workshop, a questionnaire was sent out to more than 100 corncrake experts in all countries of its breeding range. These discussions lead us to draw the following conclusions.

c At the start of the 21st century, the global corncrake population is undoubtedly much larger than was thought when the population in the eastern part of the range could only be guessed at.

c Agricultural land use is changing dramatically in the eastern part of the corncrake's distribution due to political and economic changes.

c The recent agricultural crises in several Central and Eastern European Countries are likely to have produced temporarily favourable conditions for corncrakes.

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Adult corncrake in dense grassland habitat

c Most of the corncrake's primary natural habitats have already been destroyed, and corncrakes now breed mainly in man-made habitats.

c Fulfilment of corncrake habitat requirements now depends on specific management regimes, making the species very vulnerable to changes in land use and agricultural practice.

c Even large corncrake populations can be rapidly destroyed by changes in the management of habitats within a few years as evidenced by the severe population declines documented in western Europe.

c The size of the world population was never a reason to list the corncrake as a globally threatened species. Its listing was, and remains, based on observed and expected rates of population decline. Dramatic declines are found in almost all countries where there are detailed long-term data, and where changes in agricultural practice have become less compatible with corncrake requirements.

c Corncrakes are important as a flagship species to highlight the benefits of management regimes which allow biodiversity to flourish whilst achieving economic farming objectives.

The methods used to assess the degree of threat to animal and plant populations are designed to recognise not only those species that are currently rare, but also those which are known to be vulnerable because of a history of population decline or their sensitivity to changes in habitats or other factors, usually resulting from human activities. The wisdom of this approach is illustrated by the well known case of the now extinct passenger pigeon *Ectopistes migratorius* of the eastern deciduous forests of North America. Decades before its disappearance, when it was still numerous, it was known that the population of passenger pigeons was declining because of habitat loss and hunting. One breeding area of this species held more than 130 million birds in 1871, but about 30 years later it was extinct in the wild. Our assessment of the history of corncrake populations and the factors that have caused them to decline, combined with projections of future changes in agriculture, lead us to the conclusion that the corncrake could become the 21st

century's passenger pigeon unless conservationists remain vigilant and sustainable agricultural practices are universally adopted throughout its range.

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