Corncrake *Crex crex* monitoring in European Russia in 2002-2003: a pilot study

Alexander Mischenko

The Corncrake *Crex crex* is a bird species of European conservation concern. A large part of Europe's Corncrakes breed in Russia, where it is a very abundant and widespread species. However, before 2002 there was no ongoing monitoring of Corncrake numbers. In a pilot study in 2002-2003, singing males were monitored on 22 sites in 13 different regions of European Russia and the Urals. A total area of 56 km^2 was monitored in both years. The total counts were 159 individuals in 2002 and 318 in 2003. At the local scale, the population density varied from 0.13 males/km^2 (monotonous grassland in a forest-steppe zone) to 72 males/km^2 (small mosaic meadows in taiga zone). The data from 2002-2003 showed significant annual fluctuations in Corncrake numbers. Most likely, the variation was caused by drastically different weather conditions influencing the suitability of the study areas. In 2003, Corncrake densities in flood-plain sites near the Oka and Klyaz'ma rivers were 3-10 times higher than in the abnormally dry 2002. In a site in Perm Region (Urals) the situation was the opposite: the density in 2002 was 2.7 times higher than in 2003. The underlying causes and mechanisms of the fluctuations are discussed. There is a strong need for an intensified monitoring scheme of Corncrakes and other farmland birds in Russia.

Key words: Corncrake monitoring, *Crex crex*, population density, numbers, fluctuation, Russia.

Alexander Mischenko, *Russian Bird Conservation Union, Shosse Entuziastov, 60, bld.1, Moscow 111123, Russia. E-mail: almos@redro.msk.ru*

The Corncrake *Crex crex* is a bird species of European conservation concern. A large part of Europe's Corncrakes breed in Russia, where it is a very abundant and widespread species. Its breeding range covers the whole territory of European Russia up to c. 60° north, except for steppes along the eastern coast of the Caspian Sea. However, before 2002 there was no ongoing monitoring of Corncrake numbers (Mischenko & Sukhanova 2000).

A large-scale Corncrake count was carried out in 1995-1996, and extrapolation of the results across the whole range of the species within European Russia yielded an estimate of 1 to 1.54 million Corncrake males (Mischenko & Sukhanova 2000). Given that Russia holds the highest numbers of Corncrakes in Europe, the next important task is long-term monitoring of Corncrakes. Whereas Corncrake numbers in many regions of Russia are high and probably stable at the moment, changes in farmland practices in the near future are likely to change the picture. A disadvantageous intensification of agriculture in some regions can be anticipated, while other regions are likely to see meadow abandonment and overgrowing by weeds and bush. Up-to-date information about Corncrake numbers can help to determine measures for its protection, along with a complex of other grassland birds, first of all in Important Bird Areas (IBAs). Accordingly, in 2002, the Russian Bird Conservation Union started to participate in the International Corncrake Monitoring Scheme (ICMS), organized by the RSPB jointly with BirdLife International (Schäffer & Mammen 2001). The aim of the ICMS is to follow the population trend of Corncrakes and how they are affected by

large-scale changes in land-use in Central and Eastern European Countries.

Materials and methods

The Corncrake surveys were based on the participation of unpaid volunteers, using the simplified method applied in Russia in 1995-1996 (following ICMS guidelines). Field surveyors freely selected survey sites in typical Corncrake habitats.

Two surveys in every site were done at night between 20 May and 30 June, taking into account the regional phenological differences. During each survey, the positions of singing males were mapped. Data from each survey night were summarised in a map showing all locations of the calling males. If singing birds were present at locations less than 200 metres apart on different visits, it was usually best to regard the two records as being of the same bird. If a singing bird occurred more than 200 metres from any of the birds recorded on previous visits it can be regarded as a different individual. Exceptions to this rule can be made if birds seem very likely to have moved more than 200 metres because, for example, a nearby area where birds were singing during the previous visit has been mowed.

In total, 31 people took part in the monitoring in the two years. Twenty-three of the surveyors were amateur ornithologists (adults and school children) and 8 were professionals. Twenty-two sites were surveyed in both years (Fig. 1). These sites were located in 13 regions in different parts of European Russia (including Central, North, North-West, Volga, Central-Chernozem and Ural economic-and-geographical districts): Moscow (6 sites), Leningrad (3 sites), Vologda, Perm, Nizhny Novgorod, Ryazan', Vladimir, Kaluga, Bryansk, Lipetsk regions; republics Tatarstan (2 sites) and Chuvash. Two sites were surveyed in the Sverdlovsk Region, located directly to the east of the Urals, formally in Asian Russia. The distance between the extreme western and eastern sites was 1850 km, and the distance between the extreme northern and southern sites was 960 km. The total area of all surveyed sites in 2002-2003 was 56 km^2. Four of the 22 sites (Solotcha, No. 20 in Fig. 2; Klyaz'ma, No. 17; Vinogradovo-1, No. 13 and Vinogradovo-2, No. 18), all located in the valleys of the large rivers Oka, Klyaz'ma and Moskva, were also surveyed in some years during 1995-2001, using the same methods. These sites are all regularly, but not always, flooded in spring. The results of these counts are shown for comparison. Additionally to the monitoring, information about the hunters' bags from the Klyaz'ma in Vladimir Region was collected (Corncrake is a game species in Russia).

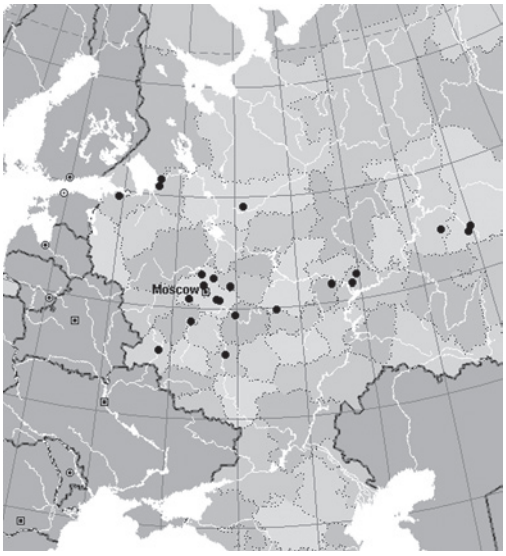

Figure 1. Location of the Corncrake survey sites in Russia in 2002-2003.
Localització de les zones d'estudi a Rússia en el període 2002-2003.

Weather conditions in 2002 and 2003

The spring of 2002 was extraordinarily dry and warm in Central Russia, with very insignificant cold snaps. There was practically no flooding in the river. The summer in 2002 in Central Russia was also very unusual in being extremely dry and hot, with many fires in forests, bogs and meadows, a weather situation not experienced since 1972. Some meadows in the regions south of Moscow became similar to dry steppes. This weather was the worst possible for corncrakes, since they mainly prefer wet habitats for breeding. The situation in the Ural regions (Perm and Sverdlovsk) was completely the opposite. The weather conditions in 2002 were very favoura-

ble for the Corncrake. The second decade of May in these regions was wet due to rains, and the third decade of May was extremely wet, because of strong and repeated rains. The first half of June was dry, while the second half was rainy. The temperature in June in total was a little bit higher than normal.

The next year, 2003, seemed favourable for Corncrake right across European Russia. Plenty of snow in winter and long and stable spring floods promoted normal humidity and good growth of meadow vegetation. May was warm and dry, while June was cold and very rainy.

Results

The total number of calling Corncrakes in 2003 was twice as high as that in 2002: 318 vs. 159 males. The highest Corncrake population densities (60.6 and 72.2 calling males/km^2) were observed on small meadows, interspersed in forests, in the Sverdlovsk and Vologda regions. The lowest density (0.13 males/km^2) was found in the extensive monotonous farmland of Lipetsk Region (Fig. 2).

At eight sites, the Corncrake density in 2003 was considerably higher (more than 1.5 times) than the previous year, whereas at five sites the density in 2003 was much lower (more than 2.5 times). At the other nine sites, changes in Corncrake density were less prominent.

The strongest rise of density in 2003 (2.5 – 10.5 times) was observed in four sites (numbers 16-18, 20). Three of them are located in the flood-plain meadows (Klyaz'ma, No. 17 in Fig. 2, Vinogradovo-2, No. 18 and Solotcha, No. 20). Flood-plain meadows are particularly sensitive to differences in humidity between years (as shown in 2002 and 2003). There was only one non-valley site with similarly strong fluctuations in population density (Sergiev Posad, No.16): 0 males/km^2 in 2002 and 8.3 in 2003.

It is important to note that at the sites in Vologda and Leningrad regions (numbers 5, 9-11 in Fig. 2), which are located in a zone with smaller annual amplitudes of humidity, differences in densities between the two years were insignificant. At the site located in Vologda Region (No. 5) construction works and recreation influenced the number of birds negatively, especially in 2003.

For four of the five sites with a strong decrease in density from 2002 to 2003, there are good explanations. In one case (No. 4 in Fig. 2), a part of the site was disturbed by civil works, in the second case (No. 3) a part of the area (meadows) had been ploughed and sown with spring crops, and in the third case (No. 1) all the sites with singing males in 2002 were flooded in 2003, and therefore inhospitable to Corncrakes. It is interesting to note that the density of Corncrakes at site 6, located in the Perm Region, in the year with normal humidity in this region and abnormal dryness in the majority of other regions (2002), was 2.7 times higher than in the year with an absence of significant humidity differences between regions

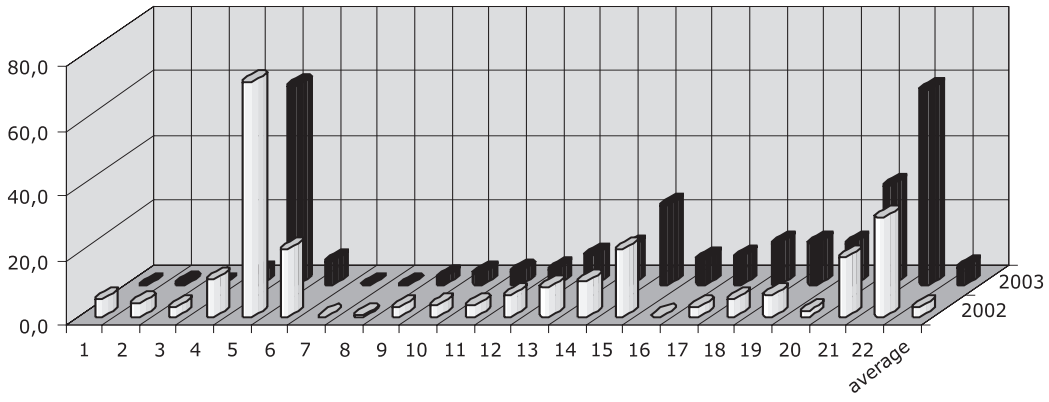

Figure 2. Densities of Corncrakes in different survey sites (males per km^2).
Densitats de Gualla Maresa a diferents zones d'estudi (mascles per km^2).

Table 1. Trends for calling males in four flood-plain sites per several years.
Evolució del nombre de mascles cantors a quatre zones inundades durant diversos anys.

Year	«Solotcha»* 10.95 sq. km	«Klyaz'ma»** 3.29 sq. km	«Vinogradovo-1»*** 3.69 sq. km	«Vinogradovo-2»*** 1.52 sq. km
1995	-	-	3	7
1996	-	28	24	4
1997	-	-	-	1
1998	109	70	-	-
1999	197	69	-	-
2000	168	80	-	-
2001	167	62	-	-
2002	14	10	33	8
2003	147	30	34	20

*In 1998-2000 fivefold count, in 2001-2003 double count; ** in 1996 and 1999-2002 single count, in 1998 triple count, in 2003 double count; *** in 1995-1996 single count, in 2002-2003 double count. The blank means that the count in the given year was not spent.
** Durant 1998-2000 es van realitzar cinc censos, i dos censos el 2001-2003; ** durant 1996 i 1999-2002 es va realitzar un únic cens, tres censos el 1998, i dos censos el 2003; *** durant 1995-1996 es va efectuar un únic cens i dos el 2002-2003. Els guionets indiquen els censos que no es van poder realitzar.*

(2003). Only for one site (No. 2), located in the Republic Tatarstan (Middle Volga), were there no obvious causes for the reduction of density in 2003.

With data for only two years, a trend analysis is of only limited value. Certainly, in coming years standard statistical trend processing will be applied.

Four sites were monitored to a varying extent also in 1995-2001 (Table 1). These sites show even more impressive fluctuations in Corncrake numbers between years, the highest values being 8 (Klyaz'ma), 11 (Vinogradovo-1), 14 (Solotcha) and 20 times (Vinogradovo-2) higher than the lowest values at a given site. Notwithstanding the large between-year variation, Corncrake densities seemed to remain stable over the nine-year period.

A population index for the four sites has been calculated using log-linear Poisson regression, but the indices have very wide confidence limits because of the very small number of plots. It is clear that surveying of more plots would be needed to provide a reliable index of Corncrake numbers for European Russia.

Additionally to the monitoring, information about hunting of corncrakes has been collected. We found that there is no deliberate hunting of Corncrakes except at one site (Klyaz'ma), and that Corncrakes may end up in the hunting bag accidentally. At the Klyaz'ma site, hunting for this species is carried out with gun dogs in August and September. It is likely that in 2000, in an area of approximately 10 km^2 (including the monitoring site and adjacent territory), 250 corncrakes were shot. For 2003, the estimate is about 130 (120 - 180). A survey of the shot birds (n=64 in 2000, n=75 in 2003) showed that young Corncrakes made up 83% and 78% in 2000 and 2003, respectively. This indicates a high breeding success during these both seasons. In 2002, because of the raised danger of fires, hunting was closed. Only 18 birds were shot, for scientific purposes. Only eight of them were young birds (44%), i.e. breeding success that year was low. Thus, the closing of hunting promoted protection of the species in the extremely dry year of 2002 with low reproduction.

Discussion

Based on voluntary Corncrake monitoring, conducted in different parts of the range, we found that numbers of this species in Russia fluctuate strongly between years. This phenomenon has been described previously in central Europe (Glutz von Blotzheim *et al.* 1973). Especially strong fluctuations in numbers of calling males (up to 20 times) in European Russia are observed in flood-plain areas, where the humidity in different years varies most sharply. However, ringing was not carried out and we therefore cannot tell whether corncrakes in dry years are present in their territories but are inactive and do not start mass breeding, or if individuals move

large distances between different areas in search of favourable conditions.

Apparently both phenomena may occur. For example, population density was high at site No. 6 in the Perm area in the year with favourable weather conditions in Urals but abnormal dryness in central Russia (2002). Despite favourable weather the next year too, numbers were 2.7 times lower in 2003, indicating that some birds were only temporarily present in this area in 2002, due to the poor conditions at other sites. At the same time, the shooting data from 2002 in Klyaz'ma (Central Russia) showed a low proportion of young, pointing at low reproductive activity that year.

The Corncrake's range in Russia is extensive, and climatic and agricultural features in different regions differ markedly. Our pilot monitoring study shows that to allow for an authentic estimation of trends in the population size of Corncrakes, a serious long-term monitoring scheme covering a large area, including the Asian part of the country, must be launched.

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Resum

Seguiment de la Guatlla Maresa *Crex crex* a la Rússia europea 2002-2003: un estudi pilot

La Guatlla Maresa *Crex crex* és un ocell europeu amb problemes de conservació. Una gran part de les guatlles mareses europees crien a Rússia on és una espècie molt comuna i abundant. No obstant això, abans del 2002 no hi havia cap seguiment d'aquesta espècie a nivell d'abundància en aquest país. En un estudi pilot realitzat el 2002-2003 es va fer un seguiment dels reclams dels mascles en 22 llocs de 13 diferents regions de la Rússia europea i els Urals. Es va prospectar una superfície total de 56 km^2 en dos anys consecutius. El cens va resultar en un total de 159 individus el 2002 i 318 el 2003. A escala local, la densitat de la població va variar des de 0,13 mascles per cada km^2 (pastures monotípiques en una zona de mosaic de bosc i estepa) a 72 mascles per a cada km^2 (mosaics de petits prats en zones de taigà). Les dades de 2002-2003 mostren importants fluctuacions anuals en les abundàncies de la Guatlla Maresa. Probablement, la variació va ser causada per diferències dràstiques de les condicions climàtiques que influeixen en l'adequació de les àrees d'estudi. L'any 2003, les densitats d'aquesta espècie en les planes d'inundació en llocs propers als rius Oka i Klyaz'dt. van ser 3-10 vegades majors que en el 2002, el qual va ser un any anormalment sec. En un lloc de la regió de Perm (Urals), la situació va ser la contrària: la densitat el 2003 havia disminuït 2,7 vegades en comparació de l'any anterior. Es discuteixen les causes subjacents i els mecanismes de les fluctuacions. Resulta urgent la necessitat d'establir un programa de seguiment de la Guatlla Maresa i altres espècies de zones agrícoles.

Resumen

Monitoreo del Guión de Codornices *Crex crex* en la Rusia europea 2002-2003: un estudio piloto

El Guión de Codornices *Crex crex* es una ave europea con problemas de conservación. Una gran parte los guiones de codornices europeos crían en Rusia donde es una especie común y abundante. Sin embargo, antes del 2002 no se había realizado ningún estudio de esta especie a nivel de abundancia en este país. En un estudio piloto realizado el 2002-2003 se monitorearon los reclamos de machos en 22 sitios en 13 diferentes regiones de la Rusia europea y los Urales. Se prospectó una superficie total de 56 km^2 en dos años. El conteo total fue de 159 individuos en 2002 y 318 en 2003. A escala local, la densidad de población varió desde 0,13 machos por cada km^2 (pastizales monotípicos en una zona de mosaico de bosque y estepa) a 72 machos por cada km^2 (mosaicos de pequeñas praderas en zona de la taiga). Los datos de 2002-2003 muestran importantes fluctuaciones anuales en las abundancias del Guión de Codornices. Probablemente, la variación fue causada por diferencias drásticas de las condiciones climáticas que influyen en la adecuación de las áreas de estudio. En 2003, las densidades de esta especie en las llanura de inundación en sitios cercanos a los ríos Oka y Klyaz'ma fueron 3-10 veces mayores que en el 2002, que fue un año anormalmente seco. En un sitio en la región de Perm (Urales), la situación fue la opuesta: la densidad en 2003 había disminuido 2,7 veces en comparación con el año anterior. Se discuten las causas subyacentes y los mecanismos de las fluctuaciones. Resulta urgente la necesidad de esta-

blecer un programa de seguimiento del Guión de Codornices y de otras especies de zonas agrícolas.

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