

The Corncrake (*Crex crex*) in Bulgaria

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1. Introduction

Bulgaria covers a comparatively small area - 110,912 km². About 65,000 km² (62%) of the country has been turned into arable land, of which pastures comprise about 15,000 km². Despite this, the country is one of the richest in biodiversity in Europe. The biota of Bulgaria includes 383 species of birds, 94 mammals, 36 reptiles, 16 amphibians, 207 fish and 27,000 insects and other invertebrate species (National Biological Diversity Conservation Strategy 1994). About 39,000 km² (35%) are forests with deciduous ones predominating over coniferous. The surface of the wetlands and settlements is about 3% of the area of the country. Over the territory of the country three

big bioclimatic regions overlap - the European continental one, the Eurasia step region and the Mediterranean.. Altogether they form a lot of transitional zones. On the other hand there is great landscape diversity in this area which includes its quite hilly character, covering also high mountain areas, mountain foot regions, plains and valleys from sea level to 2,700 m altitude. This is combined with great variety of soil, hydrological conditions and water systems. This leads to great variety of microhabitats, both in vertical and horizontal directions.

As the corncrake is a monotypical species with low ecological flexibility and quite conservative concerning its habitat requirements, it could not be expected that its numbers would be high in a

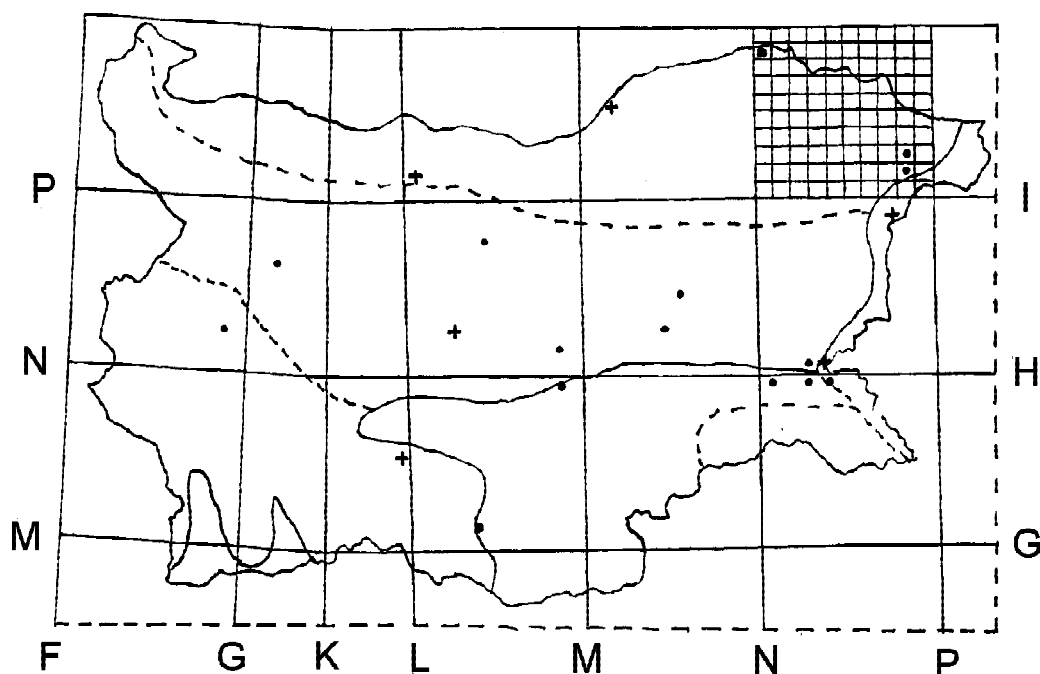


Figure 1: Data about the distribution of the Corncrake till 1990.

country with such biotic diversity. On the other hand, this gives great possibilities for research on the adaptation strategies of the species in various types of microhabitats including these in the southernmost borders of its range.

2. Development of knowledge about the corncrake in Bulgaria

The first data about the corncrake in Bulgaria appeared at the end of 19th century. According to CHRISTOVICH (1890) the species is distributed "rarely and with low quality" around Jambol, and the Pazardjik and Sofia regions. Another investigator from this period is REISER (1894). He suggested that corncrake has limited distribution only in lowlands of the country. Also the species is referred to, ANONYMUS (1903). About 60 years later, PATEV (1950) suggested that corncrake is a very common bird in wet meadows around the marshes. About 10 years later the corncrake again was considered to be a rare bird for the country. It was protected by law in 1962. At the end of the 50s, 60s and 70s, a lot of global regional investigations on the ornithofauna of Bulgaria were carried out. The aim was to expand the list of Bulgarian birds and to describe the regions of their distribution. The corncrake was mentioned during some of them. PETROV & ZLATANOV (1955) found the species near Tolbuchin and Paspaleva, ANTONOVA (1961) - near Srebarna lake. A single or a few birds have been reported in different regions of the country by different authors: BALAT (1962); MOUNTFORT & FERGUSON-LEES (1961); BOEV et al. (1961) - near Stara Zagora; DONTSCHEV (1974) - a few places on the Stara Planina mountain; DONTSCHEV (1977) - in the Sofia region and the Stara Zagora region; NANKINOV (1975, 1982) in Rodopi mountain, IANKOV (1983) in Sofia. Confirmed breeding has been reported from PROSTOV (1964) in the region of Burgas, where two nests and one young were found. Two young were found in a meadow near Tulovo village - Stara Zagora region (DONTSCHEV 1977). The species were mentioned during migration by DONTSCHEV (1963, 1970, 1976, 1977, 1980); GEORGIEV (1976); KALTSHEV (1964); PROSTOV

(1964); PROSTOV & SMILOVA (1983); HARISON (1980); BAUMGART (1975); ROBEL et al. (1978); NANKINOV (1982); NONEV (1982); ERNST (1983).

3. Distribution and important areas of corncrake population

Obviously the data till 1990, concerning the distribution of the species was not at all comprehensive. The number of the Bulgarian population was estimated to be 100 - 1000 birds during the EOAS project. Although the data are insufficient, we can assume that, from the beginning of the century there were two fluctuations in the Bulgarian population of the corncrake. Firstly, there was an increase from the end of the 19th century to the middle of the 20th century. Probably it was due to the cutting of the forests in the country, leading to the formation of open grassland landscapes. They are termed as secondary grassland communities in the area of deciduous forests in the temperate region of the northern hemisphere (BIKOV 1973). Initially these secondary grassland communities were damp - therefore very appropriate for the corncrake. After 1950, probably there was a decrease, due to the usage of these secondary grassland communities. Initially they were used for mowing and pasturing. Later, due to the process of drought and erosion, they were used only for grazing - this is the process of turning these grassland communities to steppe grasslands (VELCHEV et al. 1982). Apparently, corncrake evade such habitats, because in natural steppe grasslands in Dobrudja - NJ square, not one calling male was found (Fig. 2) Another possible reason is the increasing usage of pesticides, insecticides, fertilizers and machinery in agriculture. As a result, the bird again was considered to be rare in the country. During 1962 the corncrake was protected by law, and was included in Red Data Book of Bulgaria in 1985 as an endangered species.

It is obvious, that the data to 1990 are very limited. According to BOEV (1985) and SIMEONOV et al. (1990), it looks as though the important corncrake areas are around the Black Sea Coast and in the eastern part of the country (Fig. 1).

This results from the fact that a lot of regional ornithological research was done in the same regions. After the special counts made by the BSPB, just the opposite situation was found. These regions are of very low importance, because the major part of the population is in the western part of the country (Fig. 2).

The first special investigation on the corncrake was carried out during the 1991- 1993 period as part of a project on distribution ecology and behavior of rails (*Rallidae*) in Bulgaria. This research shows that the number of the corncrakes in Bulgaria must be much higher - only in the Sofia region (an area of 8287 sq. km.) there were among 100 and 250 birds. Some previous data on calling activity and habitat use were analyzed (DELOV 1995). After that, two successive national surveys financed by the RSPB have been done.

As a result, from the Pilot National Survey of the Corncrake in Bulgaria carried out in 1995,

among 1000-2500 calling males were estimated for the country (DELOV et al. 1995). The average density of the Bulgarian population was estimated as 2.5 males per sq. km in suitable habitats. (DELOV & JANKOV 1997c). The second national survey took place during 1996 and 1997. The data have been collected in two ways - total survey on the country and sample plots. As a result of both surveys, data of 681 calling males and their habitats were obtained. On the other hand, calling males were found in alpine and subalpine meadows in the mountains: 3 males on 25.07.1990 at 2000 -2100 meter altitude on the Vitosha Mountain near Cherni Vruh. The birds were found on grassland slope with communities of whortleberry and boggy vegetation around the streams; 1 male at the end of July, to the beginning of August, 1996 at the same place; in the last decade of July 1993 - one calling male in FM 91 and another in FM 92 in the Pirin Mountain at 2500 and 2000 meter altitude. This pointed out

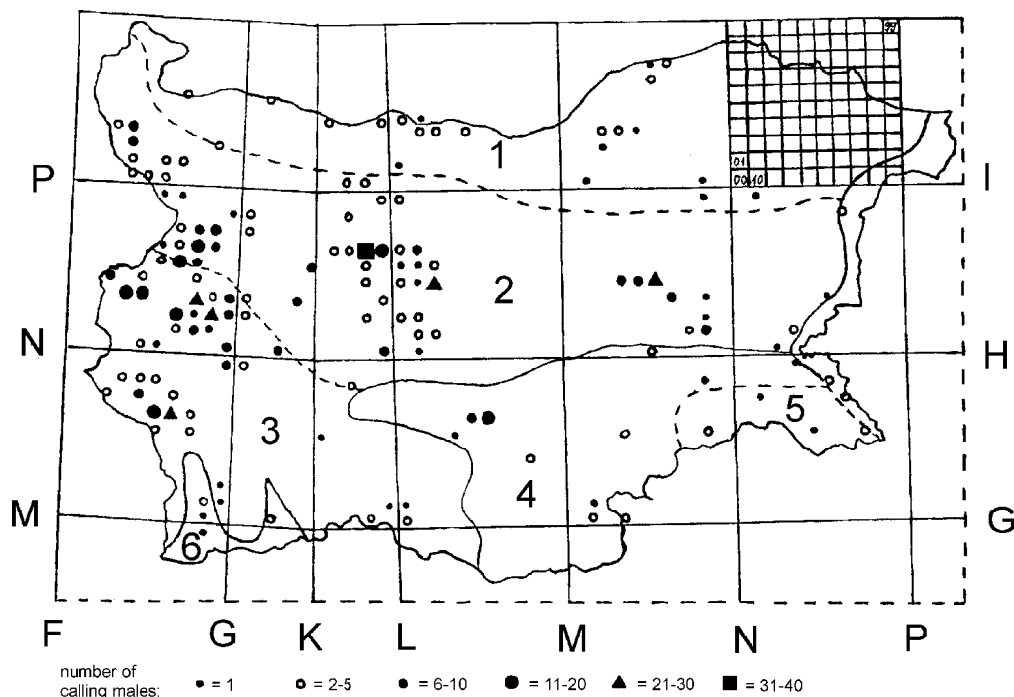


Figure 2: Distribution and number of the Corncrake in relation of zoogeographical areas of Bulgaria. - Borderline between Euro-Siberian and Mediterranean areas. Zoogeographical sub-regions: 1- Danube Region, 2- Stara Planina Mountain Region, 3- Rila Mountain/Rodopi Mountain Region, 4- Trakia Lowland Region, 5- Stranja Mountain Region, 6- Struma River/Mesta River Region

the possibility that some of the birds do migrate from lowlands to high altitude during the second half of the breeding season. To clarify this problem, we attached 15 radio-transmitters to male corncrakes. Two of them were found to migrate from 500 and 700 to 1450 (the first bird was found calling and protecting territory) and 1740 meters of altitude. This shows that such movements take place. Using the method of sample plots the number of the calling males was calculated at 8036 for the first half of the breeding season and 8735 for the second half (DELOV et al. 1997). Because of the fact that this is the first attempt to calculate a bird population in Bulgaria with this method, an overestimation is possible. We can assume that this number gives the maximum number of the population. We can give an accuracy of the census on scale 2 with the real number of calling males in Bulgaria among 4000 to 8800. The distribution of the corncrake is shown on Fig.2. It includes all accessible data for the 1990 - 1998 period. Obviously, the western part of the coun-

try is of primary importance for the Bulgarian population. Many of the important areas are very close to the Yugoslavian border. This leads to the assumption that on the other side of the border there would also be a large population. The large part of the population is situated in a 100 km FN UTM square. There is also a large number of corncrakes in FM, KH and MH squares. This means, that the species avoids lowlands and prefers hilly semi-mountainous regions in Western Bulgaria (500-1500 meters of altitude), mainly - Sofia region. Along the Stara Planina Mountain the corncrake penetrates into the eastern part of the country. In the largest plains, such as the Danube plain, Dobrudja, Trakian lowland and Black Sea coast there is a very small number of calling males. This is due to the fact, that the lowlands are almost fully turned into agricultural lands. The corncrake avoids crops in farming land and prefers natural meadows. Only 5.2% of calling males were found in crop fields (representative sample of 324 calling males). Calling males were found in 141

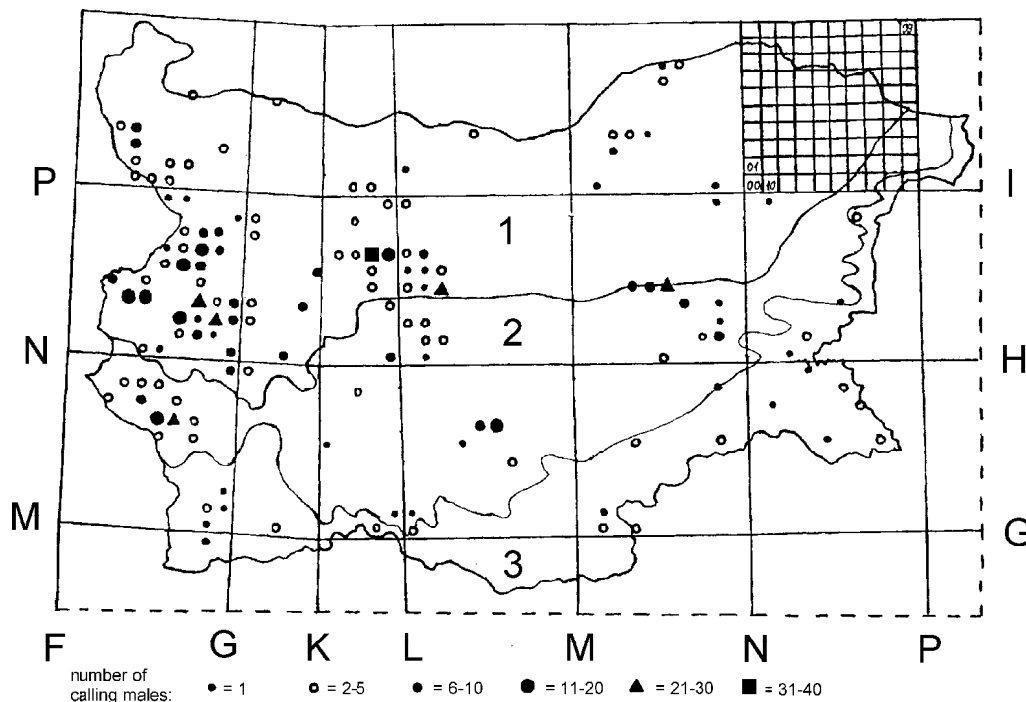


Figure 3: Distribution and number of the Corncrake in relation to bio-climatic areas of Bulgaria: 1- European-Continental Area, 2- Sub-Continental Area, 3- Continental-Mediterranean Area.

UTM squares. The mean number is 4.83 ± 0.46 calling males per square. The largest number - 35 calling males per 10km UTM square were found in KH 86 - close to the dam lake "Sopot". Other important areas for corncrake are wet meadows among the villages of Rayanovci and Dragoman containing 25 - 40 calling males - (DELOV & JANKOV 1997b) - meadows among the villages of Dolni Bogrov and Kazichene containing 20 calling males - (DELOV 1997) - and Zimevitza Meadows with 27 calling males - (DELOV & JANKOV 1997a). Important areas for corncrake can be considered all squares containing 20 - 30 calling males (Fig. 2). The distribution of the corncrake in the country shows a strong dependence in relation to climate and zoogeographical division of the country. According to GEORGIEV (1980), Bulgaria is divided into two main zoogeographical areas - Euro-Siberian and Mediterranean. Each one of them includes three subregions (Fig 2). According to another author, in reality, there is no typical Mediterranean area in Bulgaria - it is a sub-Mediterranean one (NIKOLOV 1977). Nevertheless, allowing for terminological differences; it is obvious that the corncrake strongly avoids the Mediterranean influence. It is distributed in Euro-Siberian and sub-Euro-Siberian areas of the country. Only 9.7% of the calling males were found in Mediterranean area. The same trend is strongest when analyzing the climatical influence on species' distribution. According to TISCHKOV (1982), Bulgaria contains three major climate areas: European-Continental; sub-Continental and Continental-Mediterranean. The calling males are distributed mainly in the first zone, but a considerable part of the population is situated in the sub-continental climate. Only 6.75% of calling males were found in the Continental-Mediterranean climate (Fig. 3). Further-

more, there is no strong evidence for breeding in sub-Mediterranean areas - mainly single calling males without nests or young have been found. These data may explain in a new light some trends in the population and in the entire Balkan Peninsula - we can't expect regular breeding of corncrake in Mediterranean countries. The corncrake may be strongly dependent on global climatic changes. A prognostication of such changes will be very helpful for analyzing population trends. Similar changes are very real in Bulgaria during the last decades because of the drought. This question needs special investigation. We have three areas in Bulgaria where long-term changes have been followed up - meadows near Dragalevtzi, Dragoman marsh and meadows near Dolni Bogrov village. For the 1991-1995 period there was a slight increase in the number of the birds in restricted areas (Table 1). After a period of stability, the corncrake strongly decreased. When more than one count during the same year on the same area have been done, the maximum number of calling males is given (Table 1). During the 1990 - 1998 periods, 25% of the meadows near Dragalevtzi was built up.

4. Size and development of national corncrake population

From Table 1 it can be seen that there was an increase in the number of the species during the 1990 - 1992 period. The possible reason is the change in landownership with a decrease in mowing, usage of chemicals in agriculture, etc. During the 1992 - 1996 periods, the situation seems stable. A significant decrease in 1996-1998 took place. Possible reasons for this is a few very dry years; ploughing and building up of the meadows;

Table 1: Long-term changes of the number of the calling males in restricted areas.

Area	1990	1991	1992	1993	1994	1995	1996	1997	1998
Dragalevtzi	6	5	13	14	7	10	7	9	6
Dragoman marsh	9		15	9	12	11	10	7	5
Dolni Bogrov		5	11	7		21	15	8	6
Dolno Kamartzi			17		21		8	9	7
Mean	7.5	5	14	10	13.3	14	10	8.25	6

increasing of usage of chemicals. Another specific situation is that the grass thins out in those meadows, which were not cut for a few years. Such grasslands are not very suitable for corncrake; added to the growing of bushes. The data in Table 1 show that the Bulgarian population decreases. In comparison with 1990 for a period of nine years (1990 - 1998) the decrease is 20%.

Much more impressive are data for the last five years. The mean number of calling males is almost the same during 1995 and 1995. After that, an obvious decrease takes place from year to year: 28.6% during 1996, 17.5% during 1997 and 27.3% during 1998. This data gives a decrease of 24.5% per year. The decrease from 1995 to 1998 is 57.1%. If we extrapolate this trend for all the country, it seems that we will lose more than 100% from the national population during next 5 years! The reason for this impression may be due to a fluctuation of the number of the corncrakes in the region of Sofia, and possibly in all the country. Nevertheless a serious decrease is taking place. More realistically, it seems there will be a decrease during the next ten years, at least of 20%. The reason for this prognostication, is that negative factors such as climatical changes and land usage are developing unrestrictedly.

5. Threats to the corncrake population

There are several considerable threats to the national population. The first is development of agriculture, and increasing usage of chemicals. Of equal importance are global climatic changes leading to considerable drought. In this connection, a traditional method for producing more wet grasslands is ploughing of the pastures when erosion occurs. In dry pastures, plugging could be a very helpful action for the corncrake. Another very considerable problem is hunting. Traditionally, the hunting season in Bulgaria starts with hunting of quails during August. Usually, the number of shot corncrakes in important areas is compatible with those of the calling males counted during the breeding season. Such damage affects mostly the national population. A considerable part of the shot corncrake are juveniles not

yet able to fly properly. The main losses to the species are during the end of the breeding season and migration. Another interesting problem is wintering of the corncrakes in Bulgaria. During mid-winter counts and other investigations, data about wintering birds have been collected. All these corncrakes were found around wetlands in the sub-Mediterranean area of the country. The birds can fly very well; they don't seem to be injured or sick.

6. Conservation status

In 1962 the corncrake was protected by law. The species was listed as endangered in The Red Book of Bulgaria.

7. Conservation projects

No data are available.

8. Ongoing or planned conservation or study projects

Bearing in mind the difficulty of counting corncrakes out of the breeding season, there is no good data about their real number. Of course, we don't expect Bulgaria to be a winter ground for the species, but European Mediterranean areas in the wider perspective, are quite interesting.... They need some preliminary investigation.

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