

The Corncrake (*Crex crex*) in Croatia

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1. Introduction

Historically, very little research on corncrakes was done in Croatia. Written data about the ecology and size of the corncrake population exists for only one Croatian breeding site (SCHNEIDER-JACOBY 1991, FLADE 1991). Therefore, up to now population estimates were based on rough assumptions (GREEN et al. 1997). During the past decade, some new breeding sites were discovered and investigated, and now a more accurate estimation of the recent status of corncrakes in Croatia can be given. As the majority of data is not yet published, the name of the person who gave those data is given in parenthesis.

2. Development of knowledge about the corncrake population in Croatia

The first data about corncrakes in Croatia dates from the end of 19th century and were collected by random observations during breeding and migration, but without accurate data about the size of corncrake populations. The only conclusion from this data is that corncrakes were abundant as breeding birds in the floodplains of the Sava, Kupa and Drava rivers in lowland Croatia and were recorded only as migrant in coastal wetlands (KRALJ 1997).

More precise data of the size of corncrake population exists for only two sites in the floodplains of the Sava river. Data for Lonjsko, Sunjsko and Mokro polje between Sisak and Stara Gradiška were given by SCHNEIDER-JACOBY (1991, 120-200 sing. males) and FLADE (1991, 210-450 sing. males). Investigations of the wet meadows in the Turopolje region (between the Sava and Odra rivers near Zagreb) were conducted by the Croatian Ornithological Society (with financial support from the Regional Environmental Cent-

re for Central and Eastern Europe) in 1999. According to the counts, this site holds a population of 100-200 singing males.

In all other breeding sites (Fig. 1.) accurate counts had not been conducted and exact sizes of these populations are not known. Without doubt there are even more corncrake breeding sites in Croatia to be identified.

3. Distribution and important areas of corncrake population

Corncrakes breed in suitable habitats (meadows of tall grass) in all three main geographical regions of Croatia (Fig. 1).

Lowland Croatia holds the most numerous and somewhat better surveyed populations of corncrakes. Corncrakes breed in moist, mostly periodically inundated grasslands along the Sava river from Zagreb to Stara Gradiška. These are Turopolje and Lonjsko, Sunjsko and Mokro polje (SCHNEIDER-JACOBY 1991, FLADE 1991). Beside these there are some smaller complexes of meadows in the Sava floodplain near Samobor (D. Radovic), Ivaničgrad (M. Harcet pers. com.) and in Jelas polje (M. Šetina pers. com.). Besides the Sava valley, there are only two known breeding sites - along the Drava river near Donji Miholjac (Z. Tadic pers. com.) and along the Kupa river in the Pokupsko basin (K. Leskovar and D. Radovic pers. com.).

There are only three known breeding sites in **Mountain Croatia** - meadows on the Mala Kapela mountains near Plitvice, (G. Lukac pers. com.), on the Cicarija mountain near Lanišće (D. Blažina pers. com.) and on the polje Krbavsko polje (K. Leskovar pers. com.). These meadows are situated at an altitude between 500 and 800 m asl.

In **Mediterranean Croatia** only one site is known. This is polje Paško polje along the Cetina river (Fig.1. K. Leskovar and D. Radovic pers. com.), at an altitude of 380 m asl.

Key Sites for corncrakes in Croatia are wet pastures and hay meadows in low intensity agricultural areas along the Sava river: Turopolje and Lonjsko, Sunjsko and Mokro polje. Habitats on these sites are the most suitable for corncrakes and hold the most numerous populations. For example, density of calling corncrakes reaches 13 males/km in the Turopolje region (V. Dumbovic). Grasslands in that part of the Sava river floodplain are used as a retention basin for surplus high water from the Sava river in time of floods and are not appropriate for intensive agriculture. Traditionally, extensive agriculture with low cattle numbers and without intensive hay production benefits the corncrakes.

4. Size and development of national corncrake population

4. 1. Size of national corncrake population

Realistic estimates of the population of corncrakes are known for two key sites. The Turopolje region holds 100-200 singing males (authors, 1999) and Lonjsko, Sunjsko and Mokro polje held 210-450 in 1990. (FLADE 1991). Accurate data on numbers on other sites are unknown and we can only estimate the size of population based on recent sporadic daytime counts. Ivanicgrad, the Pokupsko basin, Jelas polje, Donji Miholjac, Plitvice and Krbavsko polje hold populations of at least 20-40 singing males and Samobor, Cicarija and Paško polje hold 10-20 singing males. Appropriate counts of corncrakes on these sites will probably result in larger numbers because habi-

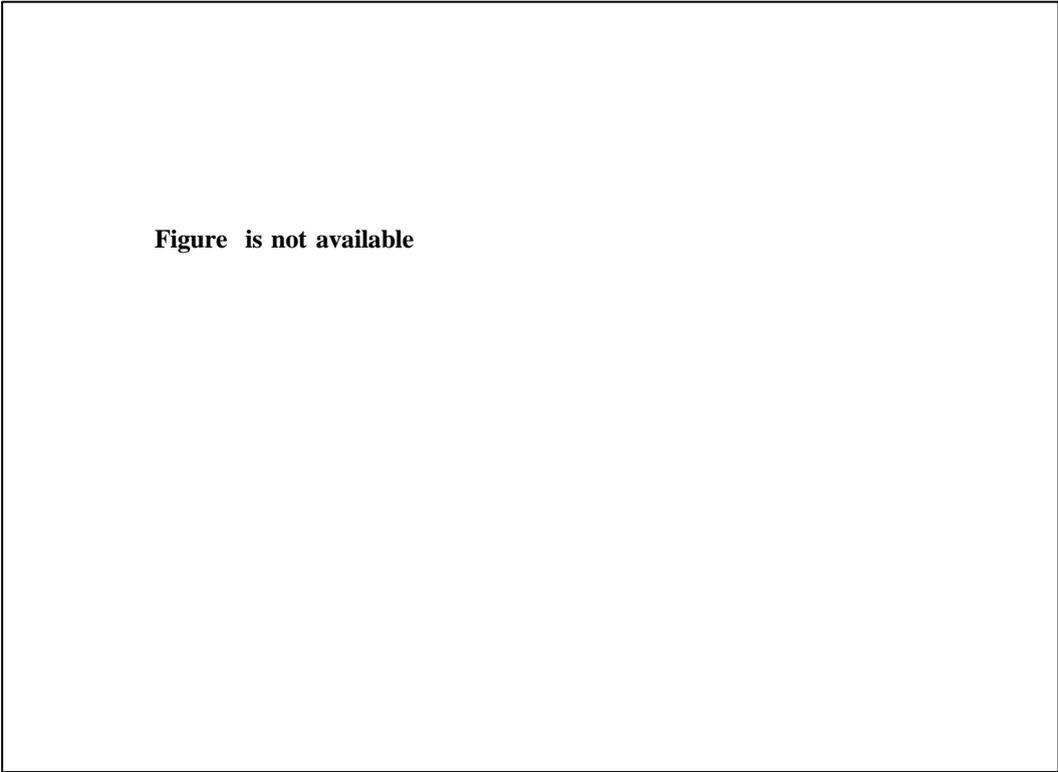


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Figure 1: Distribution of breeding sites of Corncrake in Croatia in the period 1990-2000.

tats are good for the breeding of corncrake and only small parts of these areas were surveyed. Beside that, there are suitable grassland areas, especially in Mountain Croatia, on which a corncrake survey was never conducted. We assume that there are populations to be discovered.

Based on these data, our estimate of the population size in Croatia is 460-940 singing males (accuracy of an estimate: 1). This estimate agrees with an estimate of a Croatian corncrake population of 500-1000 singing males in 1990 (GREEN et al, 1997), although the most breeding sites that hold small population were discovered in the last five years and were unknown during the estimation for Green's article. Real population size is probably larger and we assume that there are considerably more than 1000 males. For example, sporadic daytime counts in Turopolje gave an estimation of 10 breeding pairs (HEATH & EVANS 2000), but after systematic counts on the 800 ha of meadows and pastures in 1999 and 2000 the size of the population was estimated at 100-200 singing males.

4.2. Development of population

The development of population cannot be assessed because there are no data about the size of population of corncrakes before 1990. We can only say that at the beginning of 20th century corncrakes were more numerous in Lowland Croatia. The main reason for the negative trend is the intensification of agriculture after World War II. Occasionally or regularly flooded wet grasslands on which corncrakes certainly bred, were transformed into arable land due to drainage and flood prevention schemes. As an example, near Kopačak rit (wetland in NE Croatia, at the mouth of the Drava river into the Danube) corncrakes were not seen after the middle of 1960s. Today, there are no suitable breeding habitats for corncrakes in that region (J. & T. Mikuska pers. com.). A similar example is known in Mediterranean Croatia: on wet meadows at Vrana lake (near Biograd) corncrakes were last noticed in 1985. In spite of the declaration of the Special Ornithological Reserve, intensification of agriculture took

place, which resulted in loss of suitable habitat and disappearance of breeding corncrakes. Today, Paško polje is the only known breeding site in the whole of Mediterranean Croatia. That small population (10-20 singing males) probably survived because of the vicinity of the large population of corncrakes in neighbouring Livanjsko polje (in Bosnia and Herzegovina). There were at least 1000 singing males in Livanjsko polje before the recent war in Bosnia and Herzegovina (D. Radovic). During the war, there were very intense war operations in this area, and we do not have recent data about the size of the corncrake population.

5. Threats to the corncrake population

Principal threats for corncrakes in Croatia are loss of wetlands, abandonment of farming, loss of haymeadows, mechanised mowing, and hunting.

Loss of wetlands is the main reason for the disappearance of corncrakes during the last 50 years. There are no huge drainage projects in Croatia now and loss of wetlands is not a primary threat. Most of areas that were suitable for drainage and conversion to arable land are already lost to corncrakes. Building of accumulation lakes along remaining natural river flows is an existing threat for corncrakes.

Abandonment of farming is probably the most important threat. Recent changes in socioeconomic factors caused abandonment of traditional management of grasslands (hay production and cattle breeding), which maintained the grasslands in good condition for corncrakes. This threat is the most obvious on key sites for the corncrakes in the Sava river floodplain. Huge areas of hay meadows and pastures are abandoned: grazing is highly reduced because the number of cattle is low and there is no mowing of grass for hay production in some areas at all. It results in scrub growing, which probably causes corncrake disappearance. In the Turopolje region only 30 to 40 % of grasslands are mowed or grazed every year with a more negative trend in future (V. Dumbovic). A similar situation exists in the whole of Croatia - the worst situation is in

regions that were influenced by war operations (1991-1995), which caused total abandonment of cattle production, once widespread in Mountain and Mediterranean Croatia (breeding sites Plitvice, Krbavsko and Paško polje, Fig. 1). To a certain degree, there is also loss of hay meadows caused by forest plantation.

Mechanised mowing. Hay meadows in Croatia are mowed by tractor-drawn mowing machines, which cause reduction in the breeding success of corncrakes. We can assume that on key sites at least first clutches are not influenced by this threat because mowing starts mostly after 1st July, mowing is slow due to roughness of grasslands and it is not conducted simultaneously over the whole area.

Hunting. A certain number of corncrakes are killed during the hunting season for Quail *Coturnix coturnix* (from 16th August - 30th November). In Croatia, quails are mostly hunted by Italian hunters using illegal methods, (ie, tape lures) even killing protected species, which local hunters often tolerate.

6. Conservation status

Corncrakes are fully protected from hunting and destruction of nests, eggs, and chicks by the Nature Conservation Law (1994) and the Bird Conservation Act (1995). Among important breeding localities, only Lonjsko polje is legally protected (Nature Park). A Red Data Book for Birds in Croatia is not published yet.

7. Conservation projects

The only conservation project in Croatia was conducted by the Croatian Ornithological Society in the Turopolje region (key sites for corncrakes). Raising public awareness, education of farmers and promotion corncrake-friendly mowing was conducted during 2000 with financial support from the Regional Environmental Centre for Central and East Europe. The project was accompanied by a leaflet with an explanation of corncrake-friendly agricultural methods. The

Croatian Ornithological Society with the assistance of the Ministry of Environment organised the workshop "The Role of Traditional Agriculture in the Conservation of the Corncrake". Participants at that meeting were biologists, agronomists and local authority representatives. The conclusions from the workshop and the results of our corncrake survey will be the basis for future legal protection of hay meadows and pastures on which corncrake breed. Unfortunately, there is no subsidised programme for farmers that practice corncrake-friendly farming.

8. Ongoing or planned conservation or study projects

Preparation of a "Croatian Action Plan for Corncrakes" has priority in "Strategy of Conservation of Biological and Countryside Diversity in Croatia" (RADOVIC 1999) published by the Croatian government, but the former still doesn't exist nor is it in preparation phase. The Croatian Ornithological Society plans to continue survey of corncrakes in the Turopolje region and in other breeding sites in Croatia. The extent of future work depends upon the financial situation of the Society.

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