

DISTRIBUTION AND BREEDING BIOLOGY OF CROWS (CORVIDAE) IN NORTHEASTERN BULGARIA

Summary

Crows (*Corvidae*) are representatives of a family of the Order Song Birds (*Passeriformes*). Synantropic trends are observed with most representatives of this order. Urbanization has a positive impact on the population of Crows. The need for scientific justification is determined by the dynamic changes associated with the changing distribution and numbers, as well as with the changes occurring in the behavior and breeding biology of the majority of species, associated with urbanization. The completeness of knowledge about the distribution and biology of the species represented in Bulgaria is not the same for different regions. Although some regions and cities have been well studied and there is information about the density and data on the breeding biology, for Northeastern Bulgaria the data about the dynamics of the numbers, winter gatherings, environmental requirements and reproductive peculiarities are incomplete. With this work we hope to contribute to the clarification of these aspects.

The studies on the *Corvidae* species were held during a relatively long period – 1986 - 2013, on territory covering 22,910 km² (nearly 1/5 of the territory of Bulgaria). It is characterized by hilly terrain, altitude of 0-980 meters, relatively little standing and flowing waters, large areas of farmland and deciduous forests. Population is 2,667,576 (2009).

As a result of the study invasions of *Nucifraga caryocatactes* were established in the autumns of 1997 and 2008. The increase of breeding pairs of *Corvus corax* is up to 41 pairs (10 times more since 1997). The increase of *C. cornix* (in large cities and during the winter census) is from 0.8 to 10 times. The dynamics of the number of *C. frugilegus* was traced at 108 colonies. The number of colonies has decreased from a maximum of 70 to 15. Breeding pairs mark a decrease from 4975 to 1307. The population has remained relatively stable in big cities. Night roosts in winter are formed mostly in big cities and along the Danube, reaching over 15,000 individuals at one place (between 100 and 200 thousand for the whole territory). *C. monedula* nesting colonies on rocks have decreased by over 80%. Winter concentrations reach up to 5000 individuals (35-45 thousand for the region). The highest breeding density of *Pica pica* has been reported near roads - up to 7 pairs / km², in the settlements and around them - up to 5 pairs / km², with maximum winter concentrations up to 220 birds at one spot. The study established the highest overall density of *Garrulus glandarius* - 0.13 pairs/ km², in suitable habitats (suburban deciduous and mixed forests) reaching 6.6 to 13.3 pairs/ km².

The species of the family prefer respectively: *G. glandarius* - forests of *Quercus cerris* - 33%; *C. frugilegus* - belts of trees of *Populus* sp. 76%; *P. pica* - fruit trees and *Populus* sp. - By 24%; *C. cornix* - *Populus* sp. - 63%. Comparing the height of nesting, the highest average

is with the Common Raven - over 48 meters, and the lowest – with the Eurasian Jay and Hooded Crow (7-10 m).

The roundness ratio of the egg is similar with all three studied species - 0.722 with the Jackdaw, 0.728 with the Magpie and 0.742 with the Rook. The average volume of eggs is the smallest with the Jackdaw - 9.58 cm³.

The growth of chicks is most intensive with the Raven - 22.69 g / day at the average, and least with the Magpie - 8.25 g / day.

It was established that the nests of Rook are later occupied by *F. vespertinus* - 62%, those of Hooded Crow - mostly by *F. subbuteo* - 50% and those of Magpie - by *F. tinnunculus* and *A.otus* - 45-50%.