

## Ukrainian Black grouse (*Tetrao tetrix*) – Genetic diversity and population structure

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Black grouse (*Tetrao tetrix*) is a flagship species that has been studied widely through European countries. Actually, most European populations of this species are already described. Yet, we should not forget that European does not only mean those, which are in the European Union countries. The Black grouse distribution is not determined by any political boundaries and, therefore, this species should be studied across all its European distribution range to be effectively preserved.

If one looks at the map of Black grouse distribution on the widely used IUCN website, one will notice that most European Union populations are scattered, whereas the rest of European range is marked as a continuous layer. Does it mean that this species is spread all over the rest of Europe? It is, actually, more likely that such mapping is the result of some deficit of information from the post Soviet Union countries. This problem is even greater when considering the data on population genetics, not just on the distribution of species.

This project is aimed to fill in the gap in the present research of Black grouse in Europe and involves describing the neutral and adaptive genetic diversity of this species. Here neutral means just a genetic diversity reservoir, whereas adaptive is responsible for the correct function of the immune system of an organism. Two populations from the different geographical areas - the Northern Polissia region and the Carpathian Mountains - were analyzed. First, the neutral and adaptive diversity of the two populations is estimated and then it is compared between the regions. Then, the genetic structure of Ukrainian populations of Black grouse is inferred and based on this data the management suggestions are made. And, finally, the comparison between the Ukrainian populations of Black grouse and the other European ones is done.

As a result of this study, both Ukrainian populations showed surprisingly high neutral and adaptive diversity. In fact, they were more diverse than the other European populations, especially in terms of neutral diversity. The Black grouse from the Carpathian region carried the highest diversity, which was unexpected as they were thought to be small and subjected to isolation by distance. The possible explanation for this is that the Carpathian Mountains have been a refuge for the Black grouse during the last glaciation period. This idea should be checked with the mitochondrial DNA data in the subsequent research.

The two Ukrainian populations were shown to be really different both in terms of neutral and in terms of adaptive diversity. This suggests that the Northern and the Carpathian Black grouse populations should be preserved separately as independent Management Units when conservation measures are applied.

So far, it is the first study on genetic diversity of Ukrainian Black grouse. It not only yielded some new data, but also raised several questions that are recommended for the further research. First of all, the mitochondrial DNA from Ukrainian populations of this species should be obtained in order to conduct a phylogeographical analysis and to check the hypothesis of the Carpathian Mountains as a refuge for the Black grouse during the last glaciation period. More data on the genetic diversity of Ukrainian Black grouse populations should be collected via more extensive sampling of all the regions inhabited by this species, as it would contribute to capturing the whole picture of population diversity.