To understand the elusive: how to avoid the disappearance of a species at the edge of its continuous range? - the example of the black grouse.

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Abstract

Galliformes are one of the most rapidly declining groups of bird species in Europe. The black grouse belongs to species closely related to the types of habitats that are disappearing due to environmental changes caused by man, climate crisis, and an increase in the number of predator species. While the populations of this species in Northern and North-Eastern Europe are still relatively stable, in Central and Western Europe the black grouse is declining very quickly. For example, in Poland there has been an approximately 100-fold decrease in its population over the last 50 years. However, there is a difference between the rate of decline in black grouse numbers in Central European lowlands and mountain refuges - e.g. the Alps and the Carpathians. The European mountains, still offering habitats shaped by relatively severe climate, may soon be the only type of habitat for this species to survive in this part of the continent. Our study aimed to indicate the main environmental factors determining the occurrence of the species in a mountain refuge, on the southwestern border of this species’ continuous range. Based on a comprehensive model containing data on land cover by vegetation, topography, and human disturbance, we assessed environmental factors that shape the probability of black grouse occurrence in one of its last refuges in Europe. Our results reveal a trend for black grouse to prefer habitats of an early succession stage, and those can only persist in specific climatic conditions, or thanks to active protection. Detailed knowledge of the habitat choice of an endangered species is valuable data necessary to avoid the fragmentation of remaining patches of its habitat, to assess the state of the environment in times of climate crisis, and to protect its features that ensure and increase the survival of vulnerable species, such as black grouse.

Hosted file

Model Id

No. 10
No. 9
No. 8
No. 7
No. 6
No. 5
No. 4
No. 3
No. 2
No. 1

AICc

0 50 100 150 200

A) AICc = 183.90

B) AICc = 185.50

C) AICc = 185.60