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# Is southern Europe environmentally favourable for the long-term establishment of Rüppell's Vulture (*Gyps rueppelli*)?

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## Abstract

Ongoing climate change is causing latitudinal shifts in many species to adjust their distributions to climatic conditions. These changes are of particular relevance in southern Europe and northern Africa where a short-distance expansion of African species' range toward the north represents a major step in biogeographical terms, as a new continent would be reached and colonised. In this way, species that were never in contact suddenly interacts with each other, generating changes in communities. In recent decades, southern Europe has been successfully colonised by different African bird species. In addition, there are other African birds that, although not yet established as breeders, are beginning to be observed regularly, as is the case of the Rüppell's Vulture (*Gyps rueppellii*), which is highly gregarious and forms communal feeding and roosting groups with Griffon Vultures (*Gyps fulvus*) in Africa and Europe. This study aims to determine if the climatic conditions of southern Europe are adequate to host this Critically Endangered African vulture. To this end, the distribution of the species in its native range was modelled, both in the present and in future climate scenarios, using its current breeding distribution area and a set of climatic and topographic variables. The influence of each factor was obtained using variation partitioning analysis. The results show that southern Europe is not favourable for the establishment of this sub-Saharan species, and future projections indicate that this favourability will be even lower. We propose that the increasing number of records of vagrant Rüppell's Vultures in southern Europe may not be influenced by climate change, but by the support provided by the northward migration of Griffon Vultures for juvenile or immature individuals, especially during those years with extreme drought conditions.

**Keywords:** Climate change, Favourability, *Gyps rueppelli*, Species distribution models, Western Palearctic.

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