Environmental suitability model for the lanner falcon *Falco biarmicus feldeggii*: planning, study and monitoring the Sicilian population

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The identification of suitable areas, by spatially explicit distribution models, is crucial for conservation of threatened species as the lanner falcon *Falco biarmicus feldeggii*. Monitoring and collecting data on lanner falcon during years has proven to be essential for better defining the areas of species environmental suitability. Recent research shows that breeding performances of this species are strongly influenced by bioclimatic factors, especially monthly temperature and rainfall, or linked to landscape morphology, such as the slope of territories. These environmental parameters combined with species productivity (number of fledged juveniles per checked pair) of geo-referenced breeding sites have been used to develop a predictive model (PM). A former PM, restricted to eastern Sicily, has been now extended to the whole Sicilian territory thanks to field records collected within the frame of the project: 'Practical actions for preserving the main European population of Lanner falcon' supported by the Nando & Elsa Peretti Foundation. Such a new PM contains the database of productivity and geo-referenced breeding sites of a representative sample of the known Sicilian lanner population. PM is composed by dynamic GIS-level of cartographic structures (as rainfall and temperature raster) and needs periodic implementation with annual data to improve its accuracy and long-term validity. The model was used during winter 2016-2017 to search new territories, with the noticeable discovery of 5 new sites. In addition, the comparison of the 2017 productivity data with the environmental quality value, as indicated by the PM, proved the good predictive performances of the model: the most productive were also the most suitable. A potential progress is to extend its application to continental Italy in order to explore the areas of environmental suitability of lanner falcon across the whole Italian species range. PM could be a valuable tool for monitoring the Italian population, defining attention areas of Lanner and concrete conservation actions in the view of global change.