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Factors affecting wolf presence in Iberian Peninsula

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Iberian wolf population size is estimated to be around 2000 and 3000 individuals. Total wolf range estimates, from Portuguese and Spanish census, refer an area of 140 000km², which is growing in recent years, with wolf expansions south of Douro river and from the Pyrenees. We aimed to study which are the main habitat conditions for wolf prevalence in the Iberian Peninsula that kept it for so many years circumscribed to the Northwestern quadrant and prevented it to expand south and east. We used a Generalized Linear Model (GLM) with wolf presence data from national census (n=953 at a 10x10km scale) and pseudo-absences from a 100km buffer around known wolf range. Variables used for the modeling process included Landscape variables, Human variables and Prey variables. The best model created with stepwise forward method (AUC=0.88) was positively correlated with Altitude, Open Areas, Cattle and Road Density and was negatively correlated with Human Density, Forest, Goat and Sheep. Surprisingly, Road Density had a positive relation with wolf presence and this is mainly explained by high road network density in the northwestern quadrant of Iberia in comparison with central areas of the Peninsula, with a sparser road network. Results shows that wolf can accommodate a certain level of human presence and that threshold is a key factor on its current expansion. Human-wolf interactions will always be present in Iberian Peninsula, since livestock is a main prey for this carnivore. The way humans perceive wolf presence and can accommodate some level of livestock consumption will be vital for the future shape of wolf range in Portugal and Spain.