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Anticipating future human-wolf conflicts: predicting wolf expansion areas in Portugal

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Portuguese wolf population decreased to 20% of its original range in the late 80's. The wolf is fully protected in Portugal since 1986 and at the end of the nineties the population stabilized until current years. With recent wolf recovery in south Douro River in Spain, we can predict an expansion toward Portuguese territories. Since 80% of wolf diet in Portugal is livestock, the conflict with humans will be high in new recolonized areas. The aim of our study was to investigate possible wolf expansion areas and identify conflict zones to develop prevention actions. We developed a Habitat Suitability Index using Maxent model and reliable wolf presence data, from camera trapping and scat surveys with genetic validation. Using Maxent regularization multiplier of 1 and a 10% omission rate, the resulting model corresponded to 9.5% of Portuguese territory mostly in known actual wolf range. Since wolf is a generalist species we then changed threshold values for Maxent regularization parameter and threshold values for model training omission rate to highlight possible expansion areas, under current conditions. New areas were mostly constituted by border zones with Spain, from Douro river to south of Tagus river, never reaching coastal areas, adding up around 5% more national territory than initial model. Besides wolf monitoring, prevention actions in these areas should include aid to livestock owners to implement livestock protection methods (e.g. guardian dogs or fences) and general public awareness.