

Don't Gyp the Gyps

Risk Assessment on Diclofenac Poisoning of Griffon Vultures in Spain

Introduction

Vultures play a very important role in ecosystems by quickly removing carcasses preventing the proliferation of countless diseases. In addition, they prevent the population growth of many mammalian scavengers like feral dogs and rodents that would otherwise allow for the spread of many diseases, notably rabies. In Europe, vultures have traditionally been assailed by many factors and have largely been extirpated from the continent. In recent years, populations of 4 species of vultures have been making a comeback. The most successful species is the griffon vulture (*Gyps fulvus*). Despite a brief decline due to a scarcity of food following the Bovine Spongiform Encephalopathy outbreak, they are once more spreading throughout Europe. In Spain, with the reinstatement of feeding stations known as muladares, there are around 64,218 individuals.

Meanwhile, in India and other parts of Asia, the populations of *Gyps* vultures have plummeted by up to 99% in less than two decades. This decline is chiefly due to accidental poisoning from the popular NSAID diclofenac commonly used to treat livestock. Diclofenac has been banned from use in most Asian countries to protect vultures and with its absence, these populations will be able to recover. A safe drug for vultures promoted in its stead is meloxicam. In Spain, diclofenac usage in livestock is still legal despite the threat it poses to vultures. Consequently, so long as this drug and other similar NSAIDs are legal for use in livestock, the threat to griffon vultures remains very high with the potential for a similar population crash imminent. A weighted vulnerability analysis will be performed using five criteria: current range, topography, livestock prevalence, livestock donations for vultures, and muladares sites.

Methods

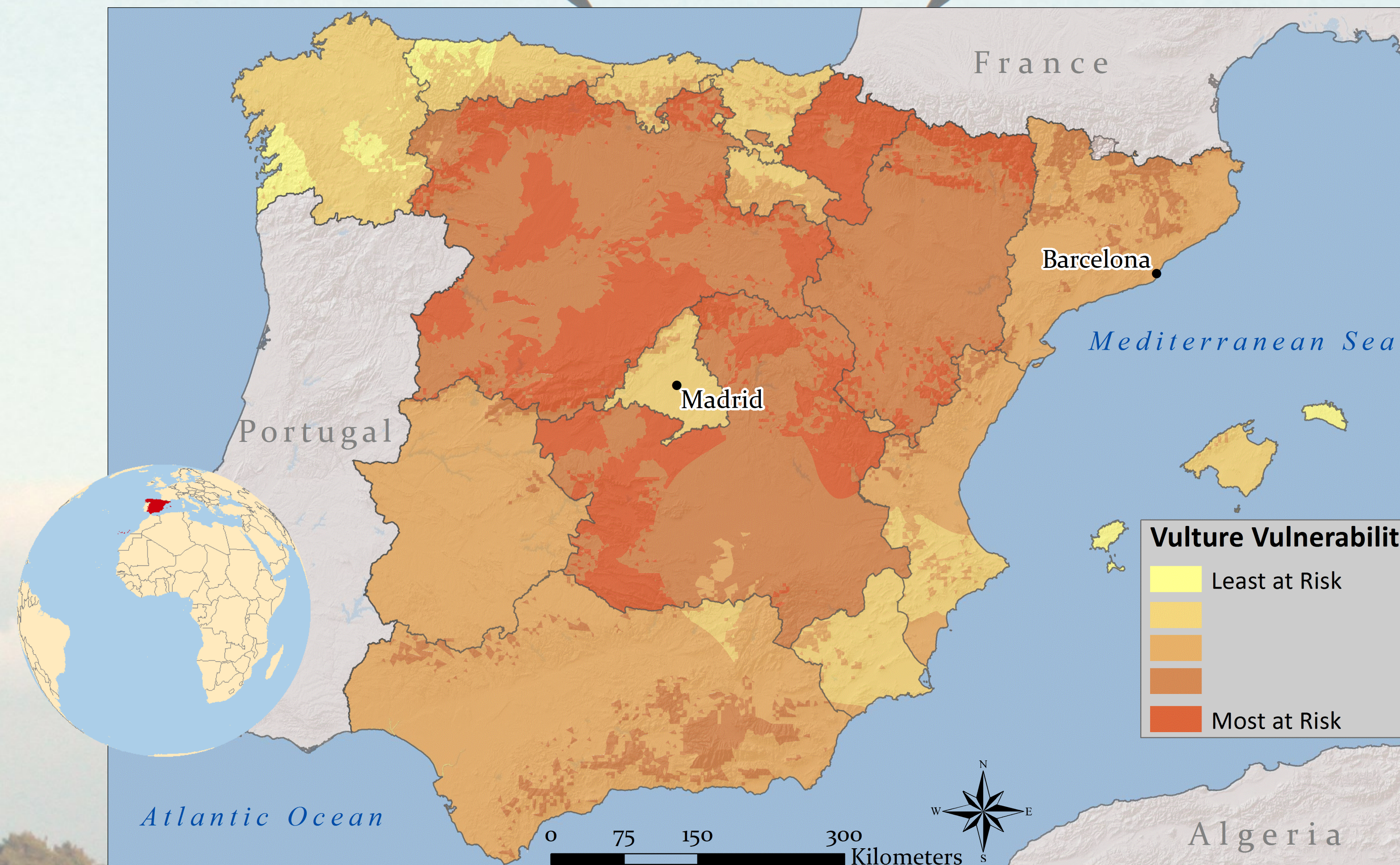
Vulnerability Analysis:

All categories were first converted from rasters to polygons. Then they were reclassified to value them on a 0-3 scale. A score of 3 correlated with the highest values for a category. Next, the union tool was used to combine the various factors. Finally, each category's value was summed together to get a final score. Higher scores were associated with a higher risk for vultures.

Conclusion

The weighted analysis showed the highest vulnerability in the autonomous community of Comunidad Foral de Navarra. High vulnerability was also found in Castilla y León and Castilla-La Mancha. The south and east of Spain displayed moderate vulnerability while the autonomous communities lining the coast in the Northwest of Spain showed the least vulnerability.

Since griffon vultures rely primarily on deceased livestock for food, diclofenac poisoning remains a very real threat. The percentage of livestock contaminated with diclofenac only needs to be less than 1% to cause a population crash in griffon vultures similar to what occurred in India. This analysis was performed to aid agencies in focusing their efforts on areas in which vulture poisoning would be most likely and hopefully would lead to better screening procedures until diclofenac can be completely banned from use.



Autonomous Community	Biomass Needs (Kg)	Contributions (Kg)	% of Needs Covered
Total España	14,159,508.0	6,518,066.0	46.0
Castilla y León	3,344,842.0	1,601,465.0	47.8
Aragón	2,515,901.0	1,597,163.0	63.5
Andalucía	1,635,006.0	No Data	No Data
Extremadura	1,497,755.0	860,121.0	57.4
Castilla-La Mancha	1,459,375.0	883,554.0	60.5
Comunidad Foral de Navarra	1,361,407.0	1,142,189.0	83.9
Cataluña	526,712.0	166,080.0	31.5
País Vasco	372,027.0	No Data	No Data
La Rioja	369,559.0	150,409.0	40.7
Comunidad de Madrid	304,640.0	0.0	0.0
Principado de Asturias	233,070.0	0.0	0.0
Cantabria	142,877.0	0.0	0.0
Illes Balears	136,484.0	0.0	0.0
Galicia	131,117.0	0.0	0.0
Comunidad Valenciana	125,096.0	117,085.0	93.6
Canarias	2,483.0	No Data	No Data
Región de Murcia	1,157.0	0.0	0.0

Data Sources

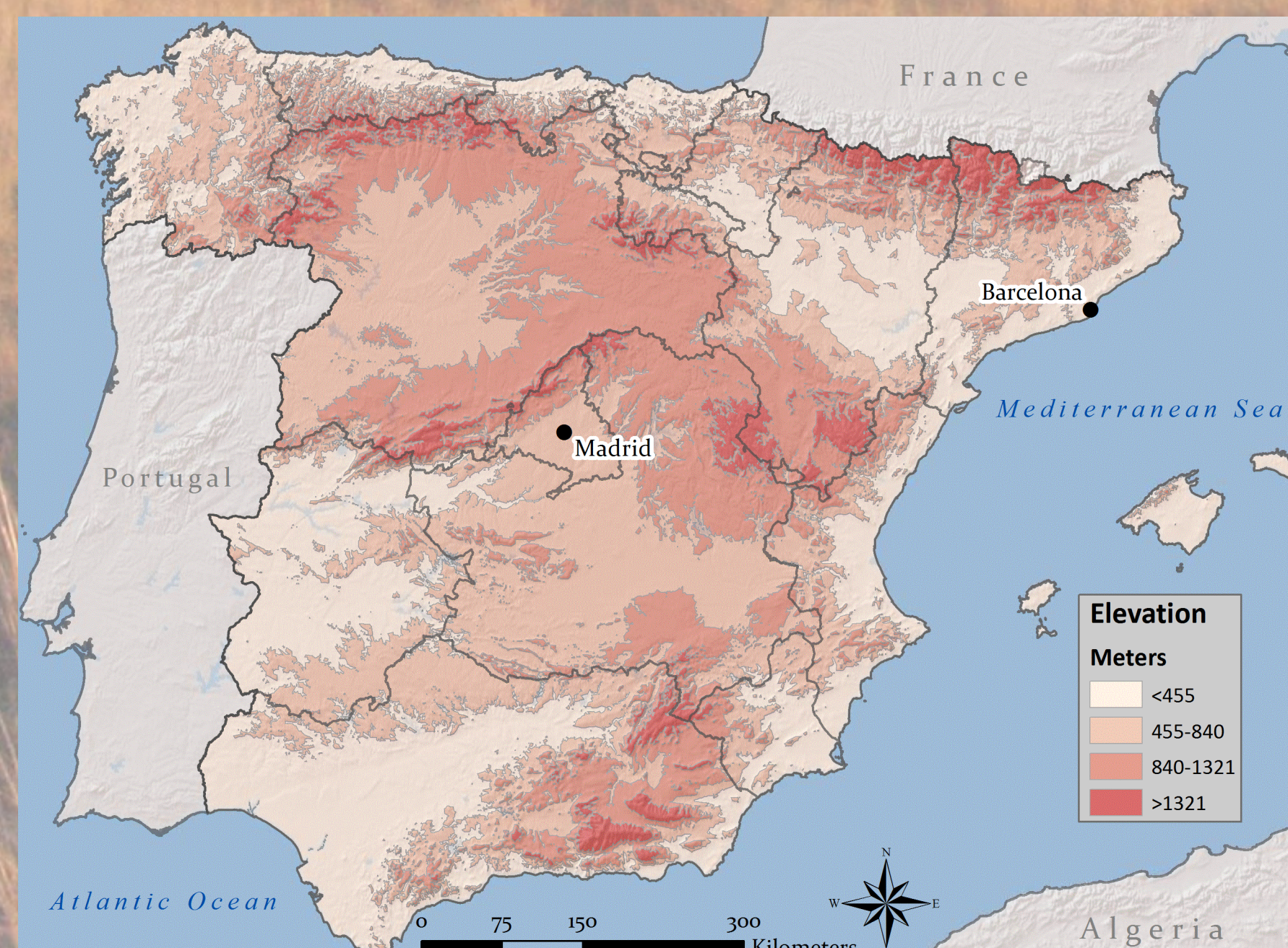
ESRI ArcMap 10.3
 BirdLife International and NatureServe (2015) Bird species distribution maps of the world. BirdLife International, Cambridge, UK and NatureServe, Arlington, USA.
 SANDACH de El Ministerio de Agricultura, Alimentación, y Medio Ambiente
 WGS_1984_Complex_UTM_Zone_30N
 Cummings School of Veterinary Medicine

Acknowledgements

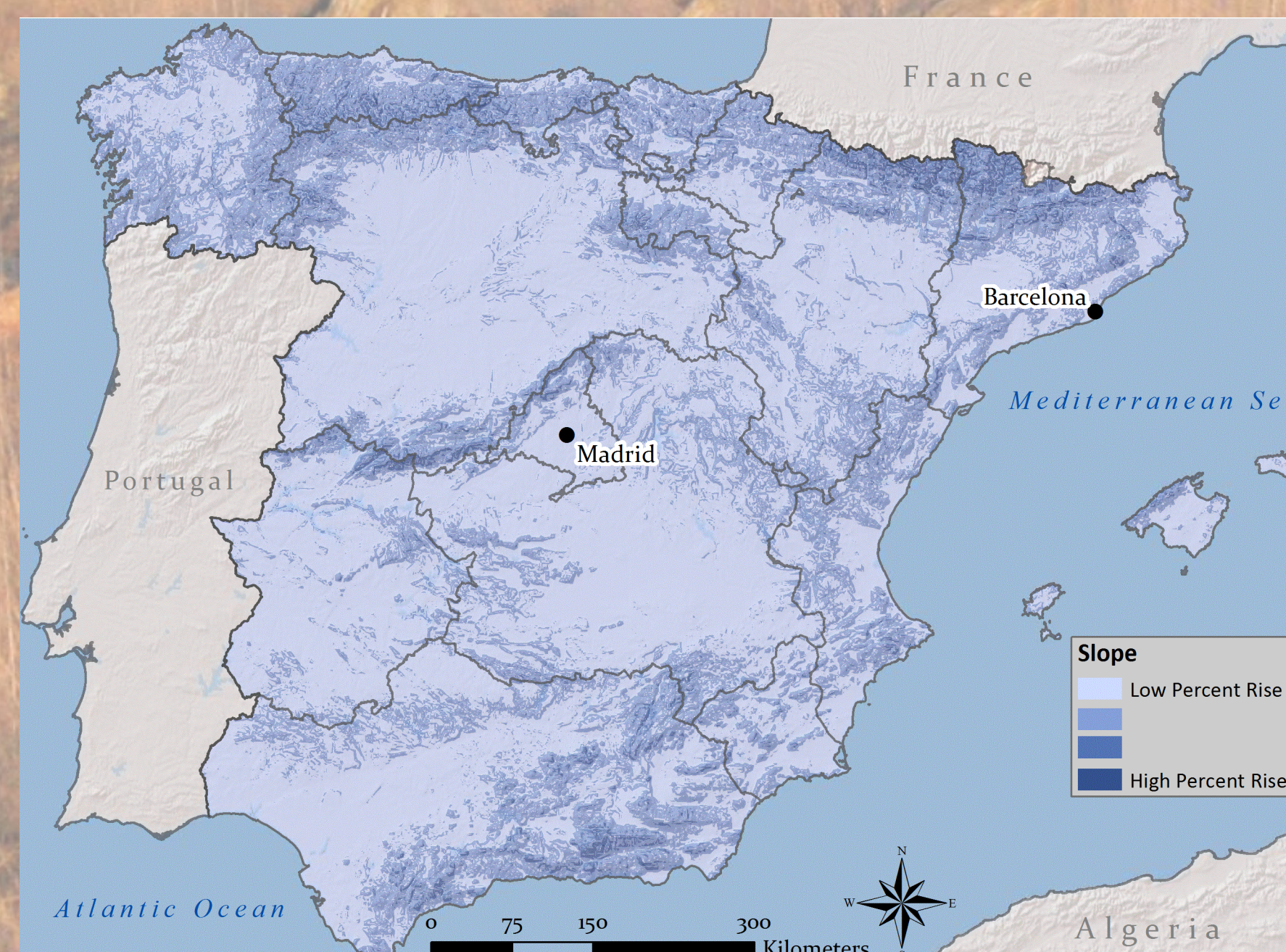
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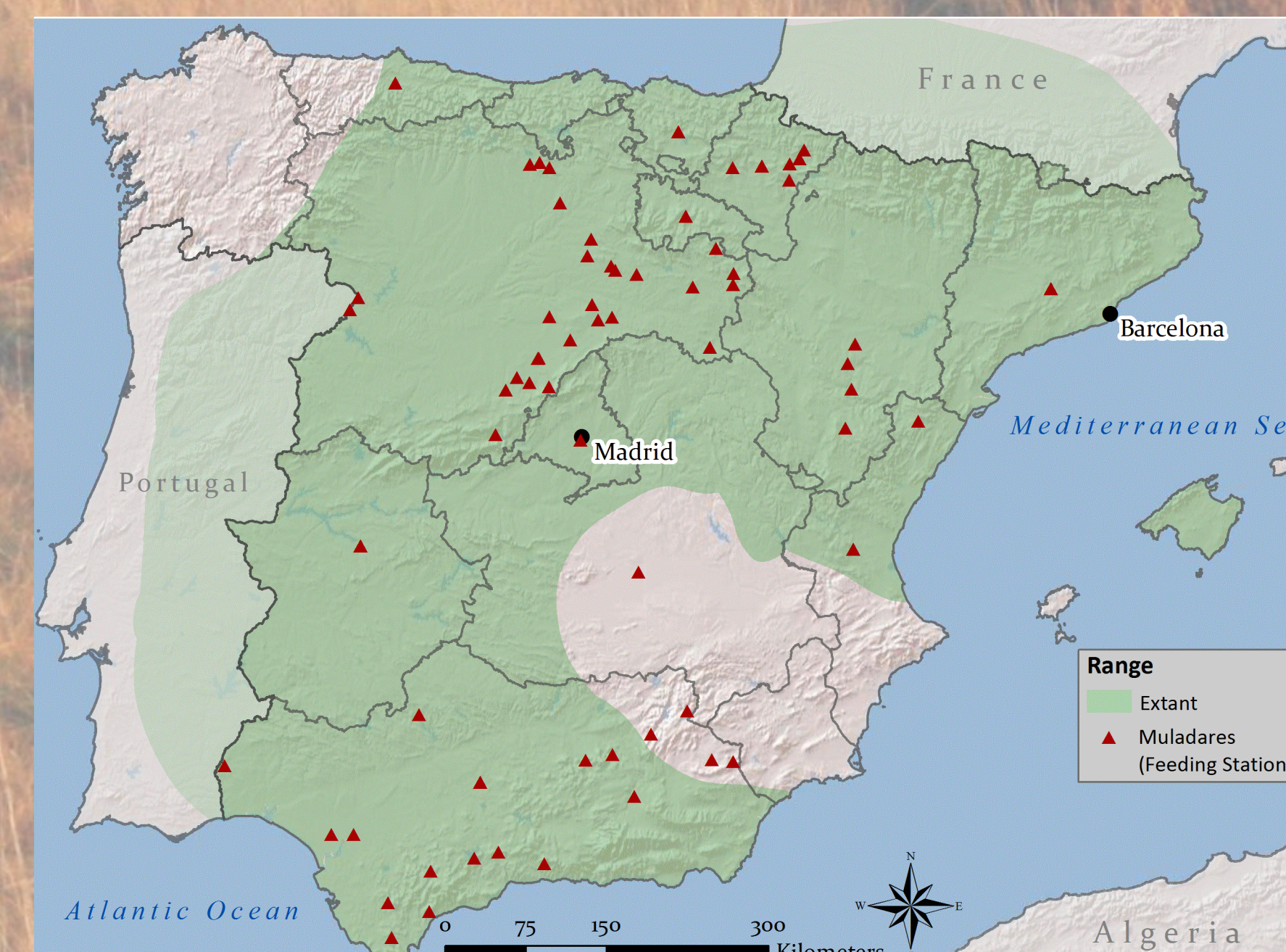
Elevation



Slope



Range & Muladares



Ranching

