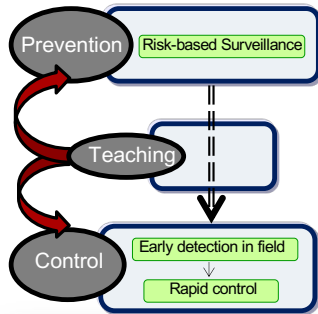


Global strategy





Risks: where, when?

Method: risk assessment
Disease: FMD
Study region: Spain

After the 2001 FMD epidemic in UK (USD 62,380 million), Ireland, France and The Netherlands.
What is the risk of FMD introduction into Spain?
Could the livestock insurance cover this risk?

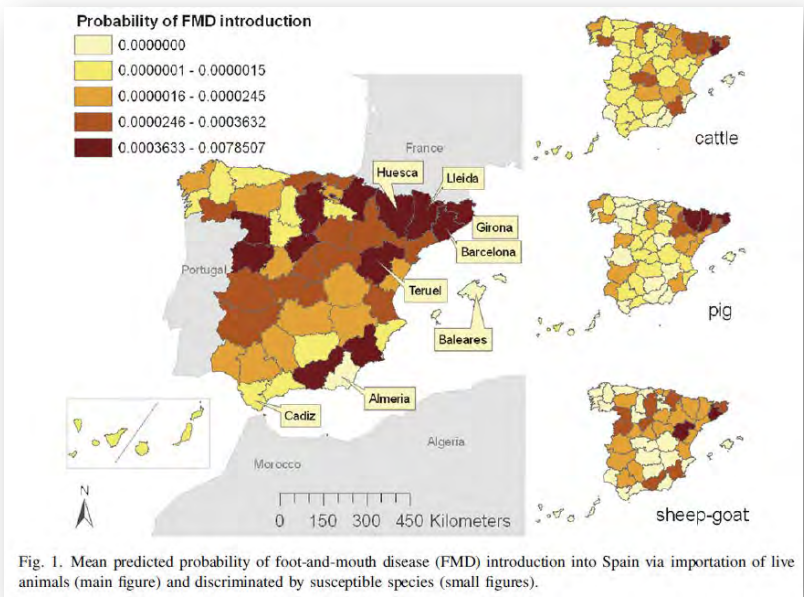


Fig. 1. Mean predicted probability of foot-and-mouth disease (FMD) introduction into Spain via importation of live animals (main figure) and discriminated by susceptible species (small figures).

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Preventive Veterinary Medicine 86 (2008) 43–56
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PREVENTIVE VETERINARY MEDICINE

Quantitative risk assessment of foot-and-mouth disease introduction into Spain via importation of live animals

B. Martínez-López^{a,*}, A.M. Perez^{b,c}, A. De la Torre^d, J.M. Sánchez-Vizcaíno Rodríguez^a

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Received 31 July 2007; received in revised form 22 February 2008; accepted 5 March 2008

Risk assessment+ economic evaluation applied to livestock insurance in Spain

$$PI_{VFA} = 1 - (1 - p_{cgs})^{n_{cgs}}$$

Country s, Spanish province g, species s



Domestic extensive systems

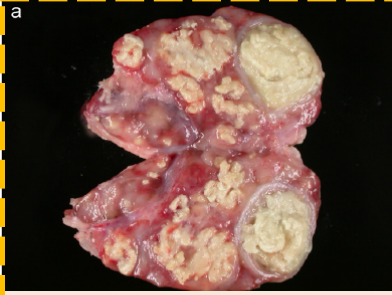


Hunting estates



risk factors?

million € in 2
still some
risk factors
including t

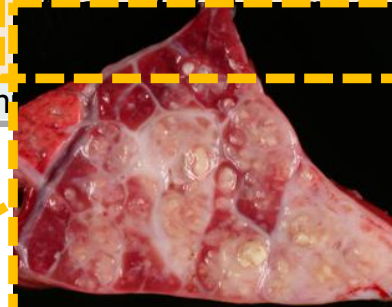


level model
Ciudad Real
gram in
face)?



Fragmented Mediterranean agricultural habitat: forests, scrublands + dehesas

evalen
Most com



Mean 12% TB prev.
(Boadella et al, 2011)



Wildlife



Domestic extensive systems



Hunting estates



In this complex scenario there is a need to better understand:

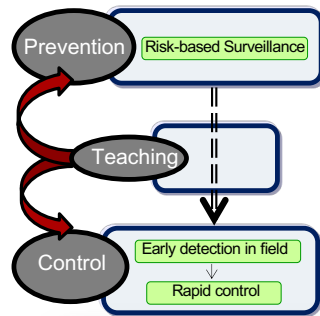
- Specific role of different wildlife populations
- Factors and management practices that are mostly contributing to TB transmission to cattle



Target interventions

Wildlife





Risk factors?

Method: multilevel model
Disease: bTB
Study region: Ciudad Real

Despite the costly (35 million € in 2011) bTB eradication program in Spain there are still some high-prevalent areas...

Which are the risk factors for bTB occurrence/new-infection/persistence (including the wildlife-domestic interface)?

1) **RESEARCH ARTICLE** Open Access

A Bayesian approach to study the risk variables for tuberculosis occurrence in domestic and wild ungulates in South Central Spain

Victor Rodríguez-Prieto^{1*}, Beatriz Martínez-López^{1,2}, José Ángel Barasona³, Pelayo Acevedo^{3,4}, Beatriz Romero¹, Sabrina Rodríguez-Campos¹, Christian Gortázar², José Manuel Sánchez-Vizcaino¹ and Joaquín Vicente²

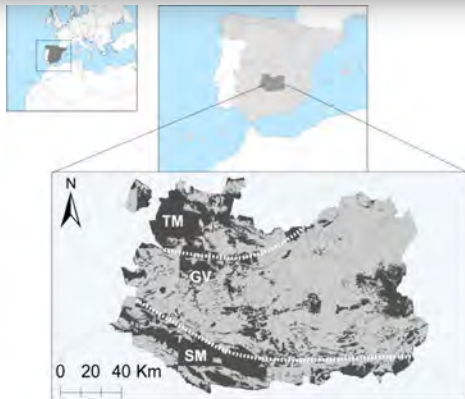


Figure 1. Location of Ciudad Real (19,813 Km²). TM= Toledo Mountains; SM=Sierra Morena Mountains. GV=Gadiana River Valley.

2)

Preventive Veterinary Medicine
 Volume 128, 1 June 2016, Pages 101-111

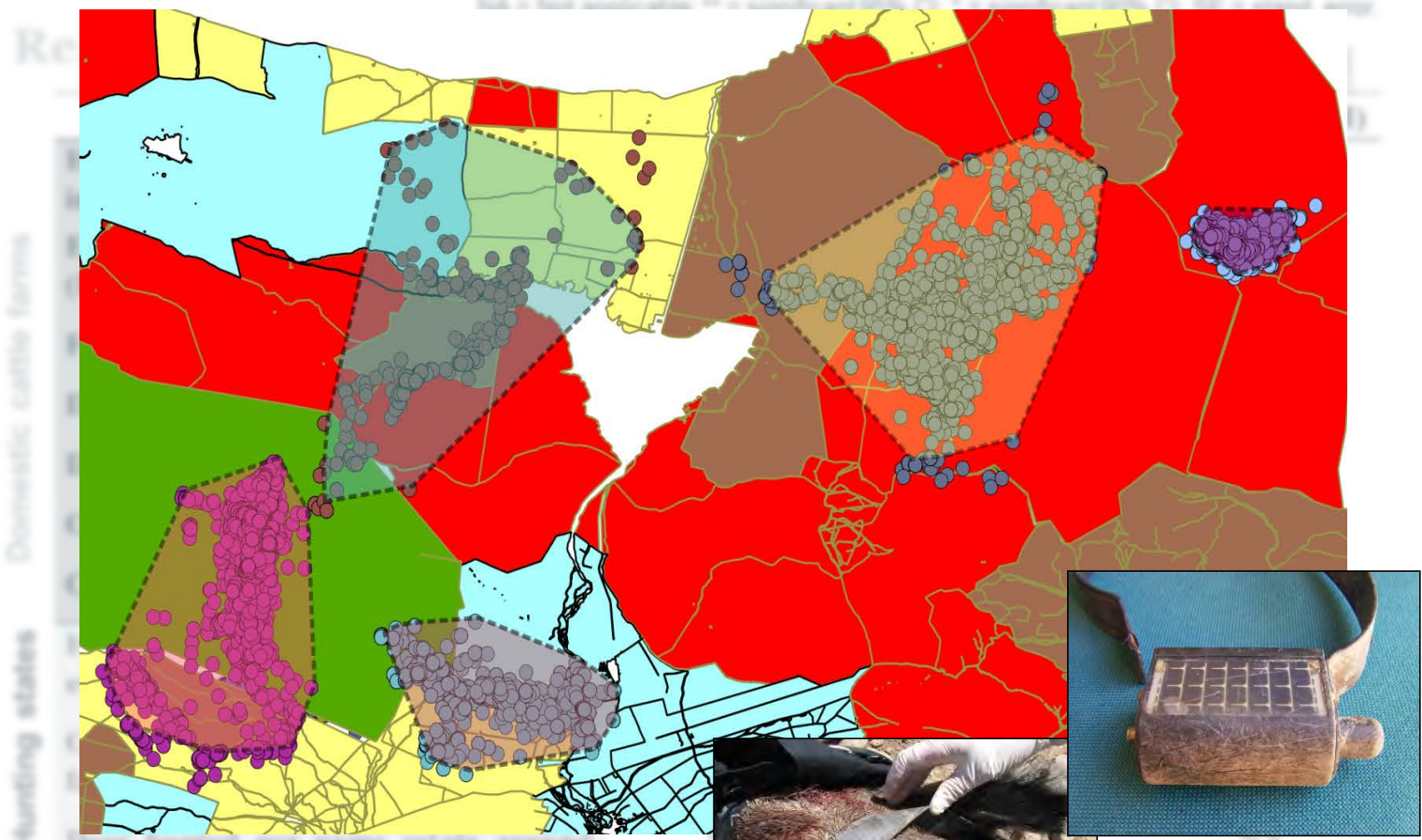
Spatially explicit modeling of animal tuberculosis at the wildlife-livestock interface in Ciudad Real province, Spain

Nathaniel P. LaHue^{a,✉}, Joaquín Vicente Baños^b, Pelayo Acevedo^b, Christian Gortázar^b, Beatriz Martínez-López^a

NA = Not applicable; ** = significant 95% CI; * = significant 90% CI; SE = stand. error.

Results/Discussion

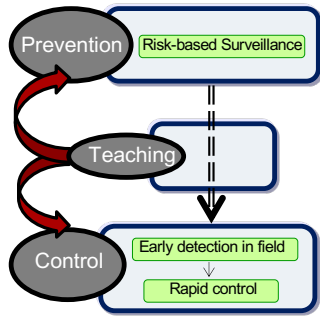
		TB occurrence	New-infection	Persistence
Variable description		OR (Model I)	OR (Model II)	OR (Model III)
Domestic cattle farms	Historical persistence of TB on farm in previous years (2003-2006) (b)	4.23**	NA	3.84**
	Extensive production systems (Beef/bullfighting)	3.03**	3.01**	3.69*
	Farm Census (s)	1.99**	1.33**	2.19**
	Distance to goat farms (b)	0.71*	0.64**	NA
	Distance to sheep farms (s)	1.21*	1.19*	NA
	Outgoing cattle shipments per year (b)	NA	1.52**	NA
	Cattle leaving the farm per year (s)	0.79 *	NA	0.71*
Wildlife/Hunting states	High number of fenced big game estates around the farm (b).	1.75**	1.55*	1.79**
	Open big game estates around the farm (s)	NA	NA	0.62**
	Deer hunted per game estate around farm (s)	NA	1.20*	NA
	Distance to open big game estates (b)	NA	1.45*	NA
σ_j^2 (SE)		0.86 (0.93)	0.44 (0.66)	0.87 (0.93)



- ✓ Land use
- ✓ Areas at high risk of contact with cattle



12 out of the 22
GPS wild boar
tracked visited
cattle farms



Risk factors?

Method: bayesian model
 Disease: CSF
 Study region: Bulgaria

Bulgaria (and EU) wants to eradicate CSF...
 Which are the factors contributing to CSF occurrence in Bulgaria?



Multilevel logistic Bayesian model
 (WinBUGS14 and R-language)



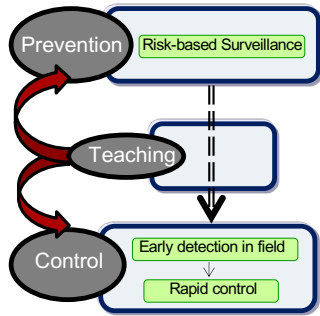
East Balkan pigs

Family-B pigs

Factor	OR
East Balkan pigs	2.15**
Outgoing shipments	1.68**
Urban population	1.46*
Family-B pigs	1.36*
Backyard pigs	1.22*
Household consumption	0.81*
Family-B pigs * Hous. Coms.	0.51**

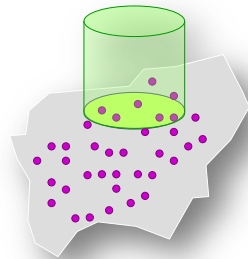
**signif. at 95%PI, * signif at 90%PI

Martínez –López et al., 2014

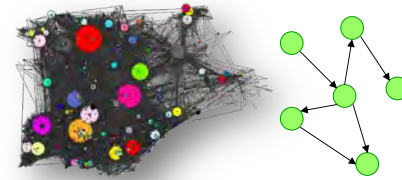
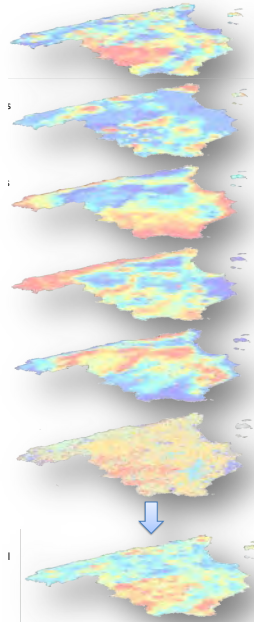


High risk areas/time periods/
individuals?

Spatial/temporal clusters?
Suitability areas for disease?
Structure of contact patterns?

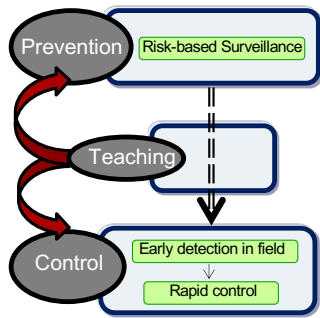


CLUSTER ANALYSIS



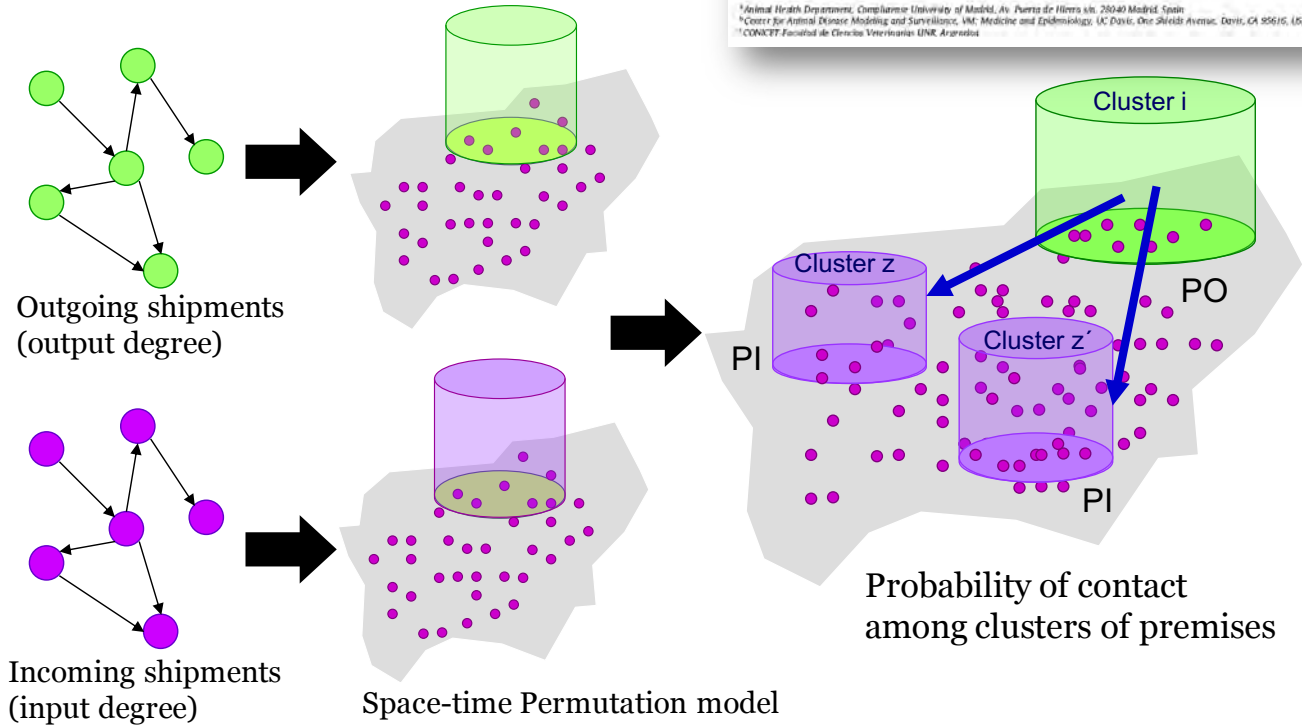
SOCIAL NETWORK ANALYSIS

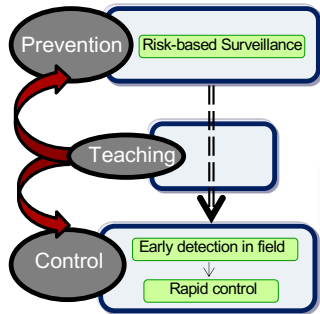
**RISK MAPPING,
CLIMATIC AND ENVIRONMENTAL MODELS**



High risk areas/time periods/
individuals?

SNA
+
Cluster análisis





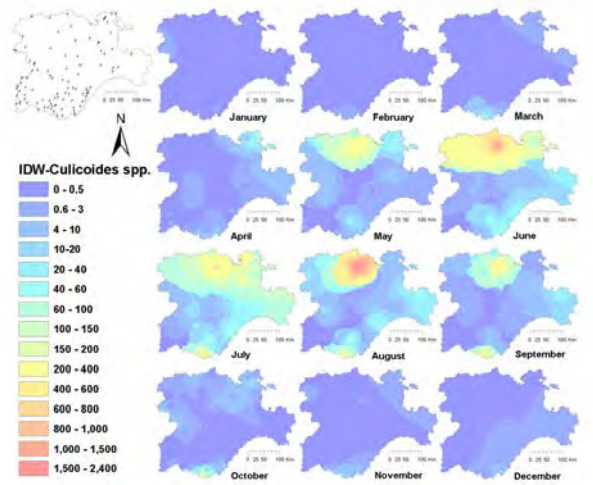
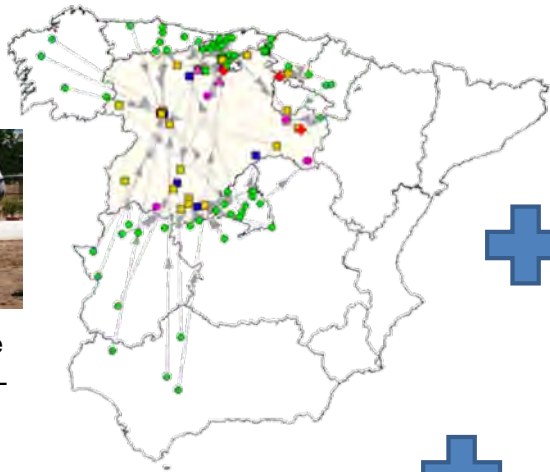
High risk areas/time periods/
individuals?

Method: SNA + cluster Anal + IDW
Disease: any (equine)
Study region: Castilla y León

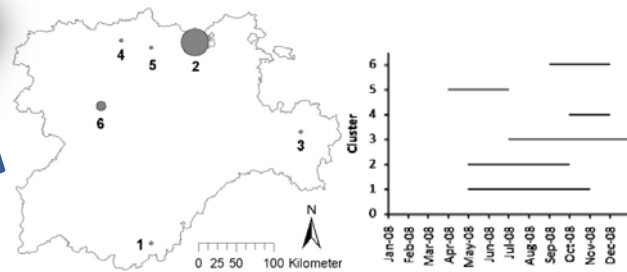
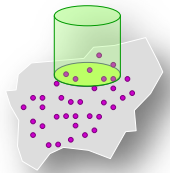
SNA + cluster analisis+ geostatistical methods



Incoming equidae shipments into CyL



Monthly abundance of Culicoides spp

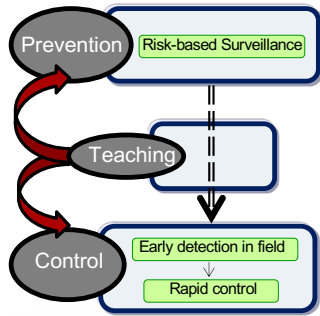


Special issue Preventive Veterinary Medicine 100 (2011) 100–108
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journal homepage: www.elsevier.com/locate/prevetmed

Identifying equine premises at high risk of introduction of vector-borne diseases using geo-statistical and space-time analyses
B. Martínez-López^{a,*}, A.M. Perez^{b,c}, J.M. Sánchez-Vizcaíno^a

^a Centro de Vigilancia Sanitaria Veterinaria (VISAVET) and Animal Health Department, Complutense University of Madrid, Madrid, Spain
^b Center for Animal Disease Modeling and Surveillance, VM: Medicine and Epidemiology, UC Davis, Davis, CA, USA
^c CONICET, Facultad de Ciencias Veterinarias UNR, Casilda, Santa Fe, Argentina



High risk areas/time periods/
individuals?

Method: MCDF (weighted overlay)
Disease: WN (zoonosis)
Study region: Castilla y León

Given the re-emergence of West Nile in Europe...
Which are areas at high risk for West Nile in Castilla y León?

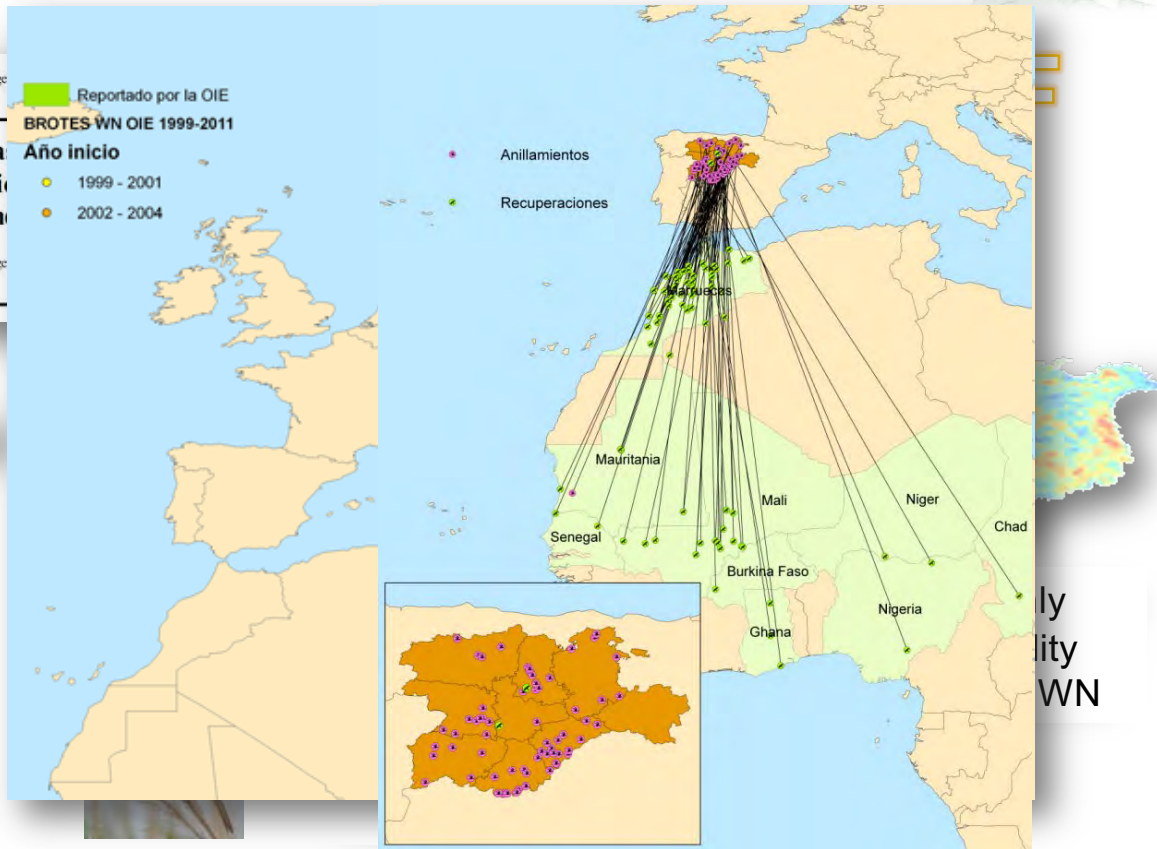
Epidemiol. Infect. (2012), 140, 1617–1631. © Cambridge
doi:10.1017/S0950268811002366

Identification of suitable areas in equid populations for application of the example of the Castile and León

Epidemiol. Infect. (2012), 140, 1617–1631. © Cambridge
doi:10.1017/S0950268811002366



Equine density



ly
ity
WN