

Brown Bear Monitoring and Conservation

History of range and demographics of brown bears in Spain

Alberto Fernández Gil

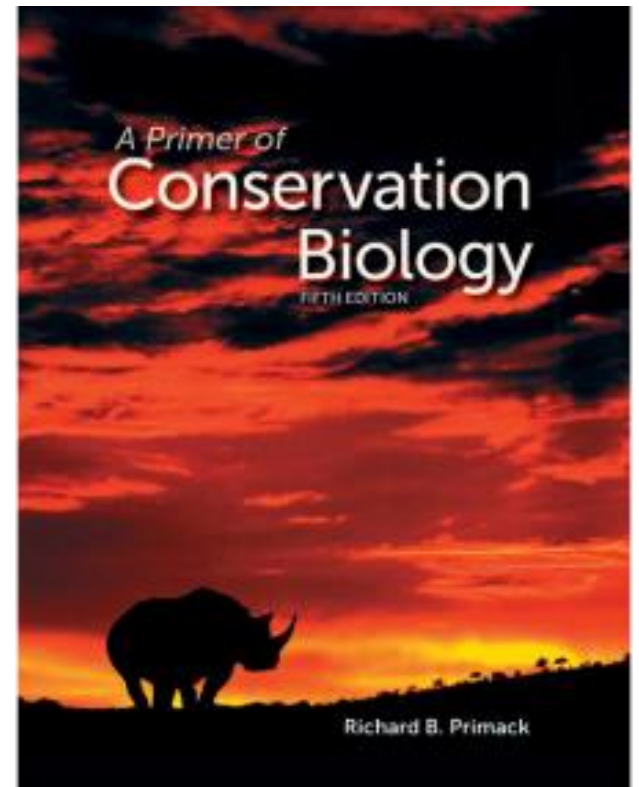
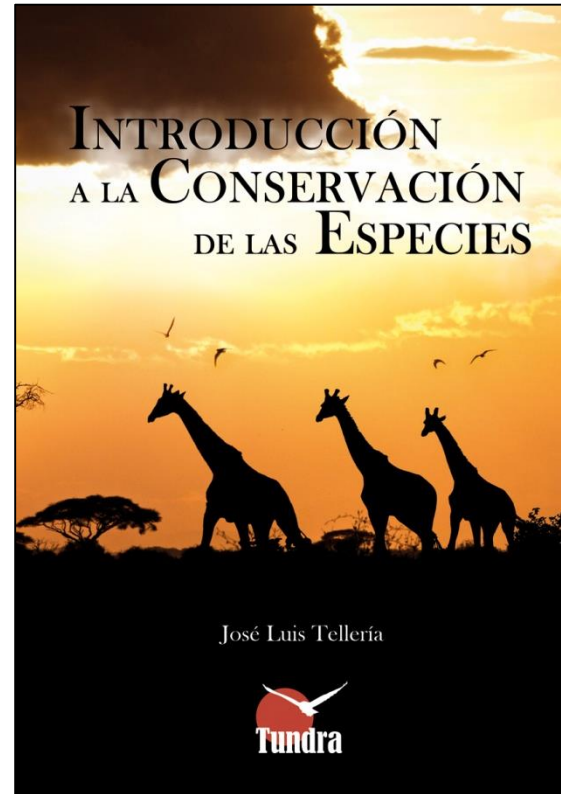
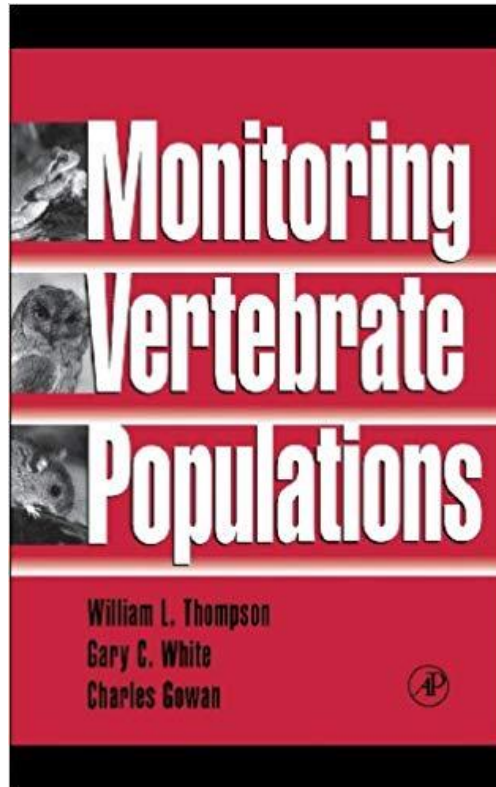


Conservación y Monitoreo de Osos Pardos en la Cordillera Cantábrica

Alberto Fernández Gil

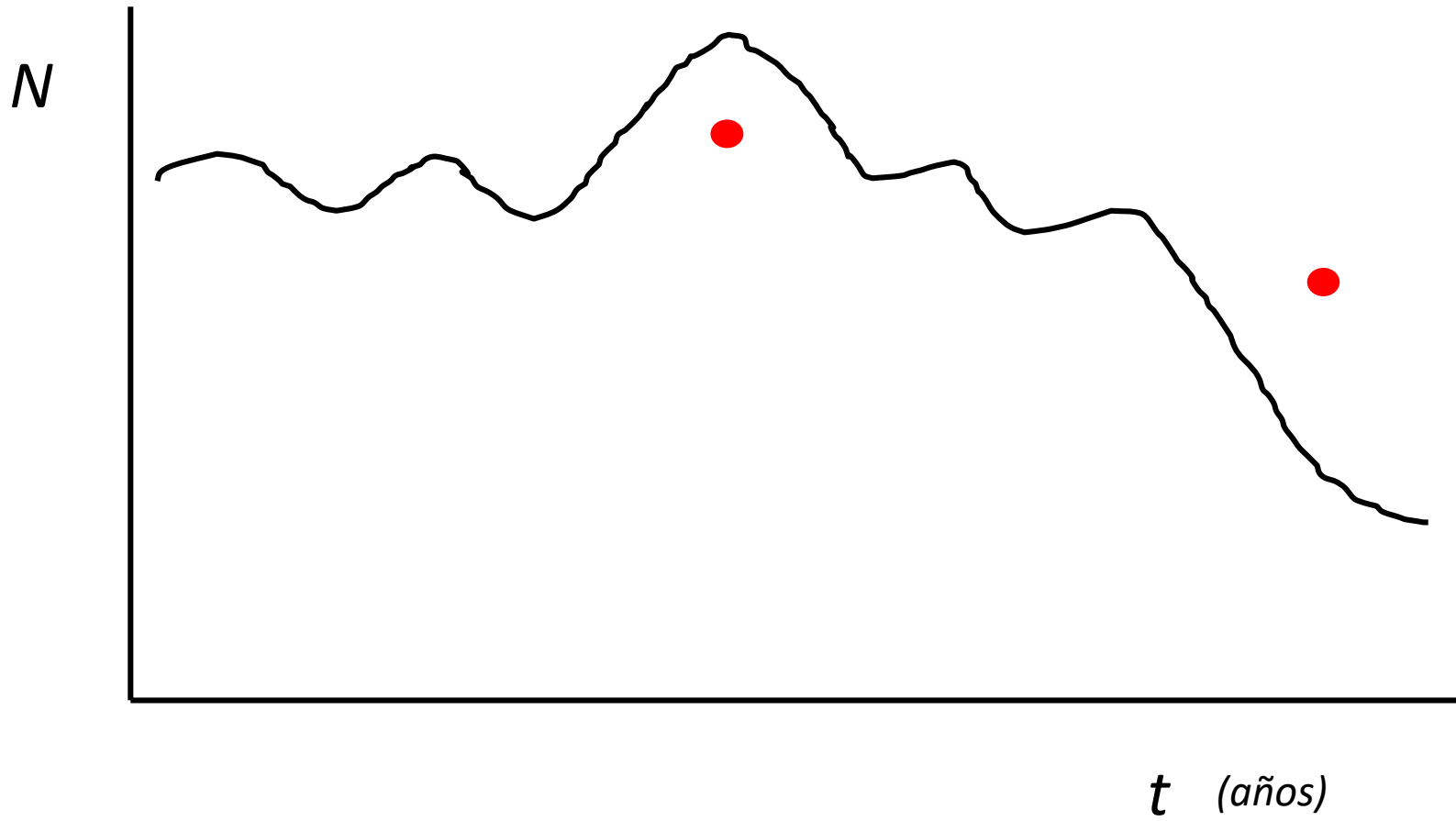


Monitoreo: una herramienta de conservación

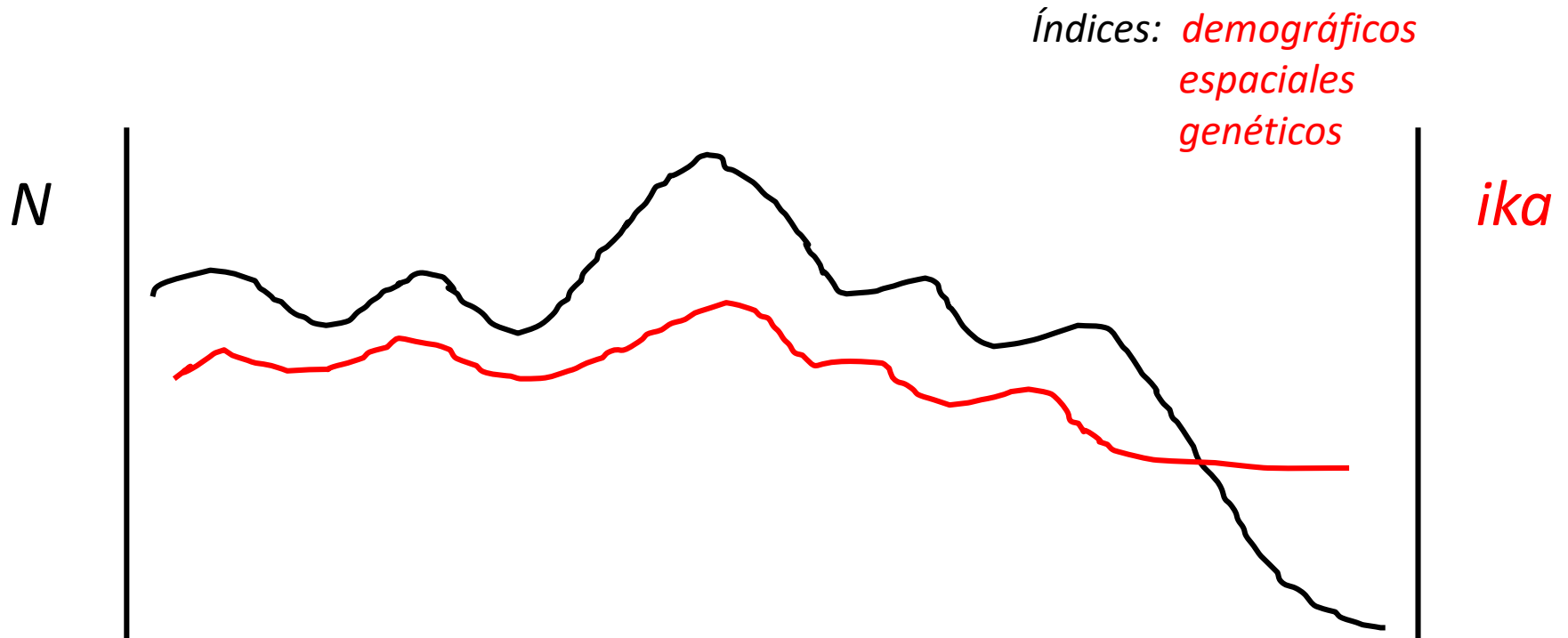


¿Qué es? Control rutinario de abundancia como sistema de detección precoz

Monitoreo: sistema de diagnóstico para detectar cambios



Objetivos: detectar cambios (crisis) a tiempo

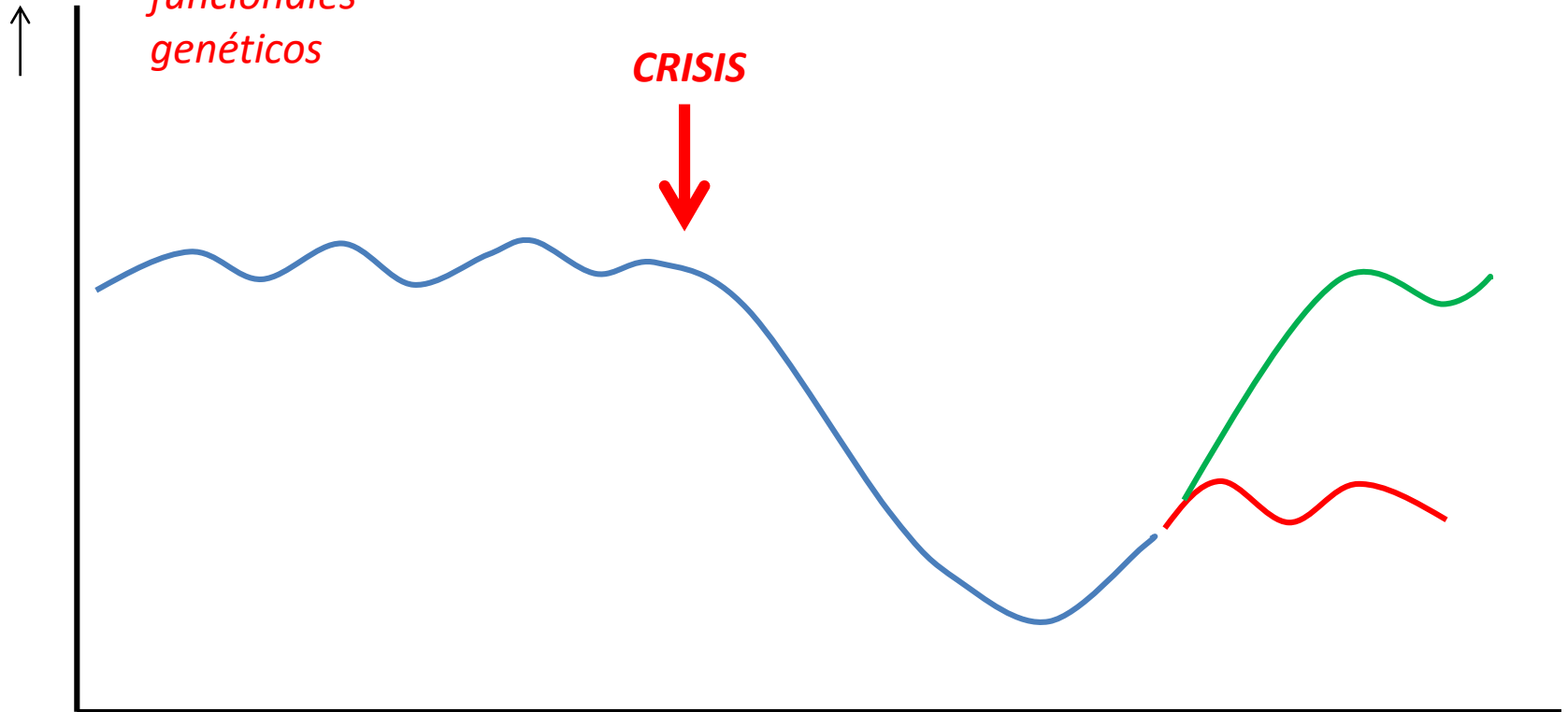


Las estimas inexactas tienen graves consecuencias si se sobreestima N

Las estimas imprecisas pueden ignorar una situación crítica

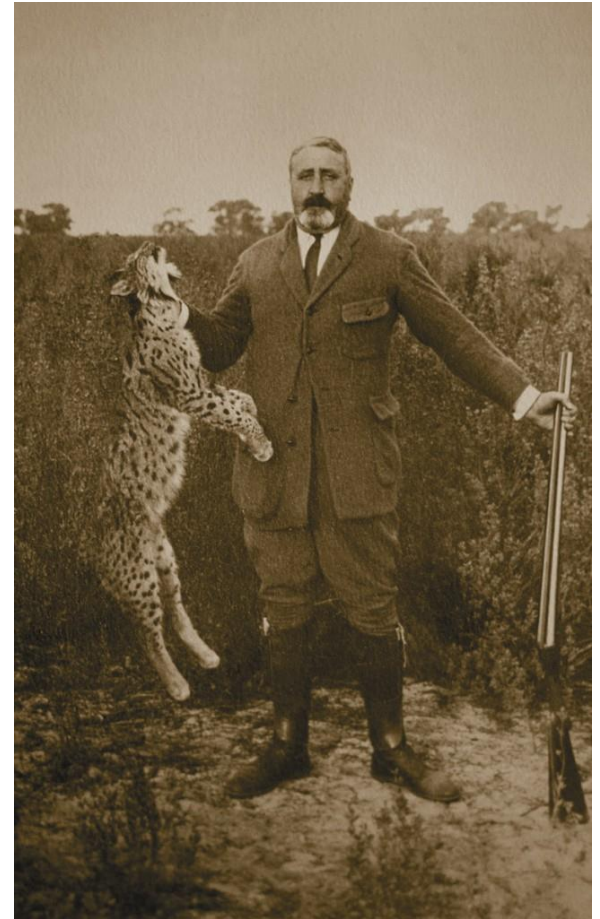
Objetivos: detectar crisis y evaluar recuperación

Índices: *espaciales*
demográficos
funcionales
genéticos



Declive brutal en N y en distribución en tiempos históricos y recientes

Las causas de la crisis

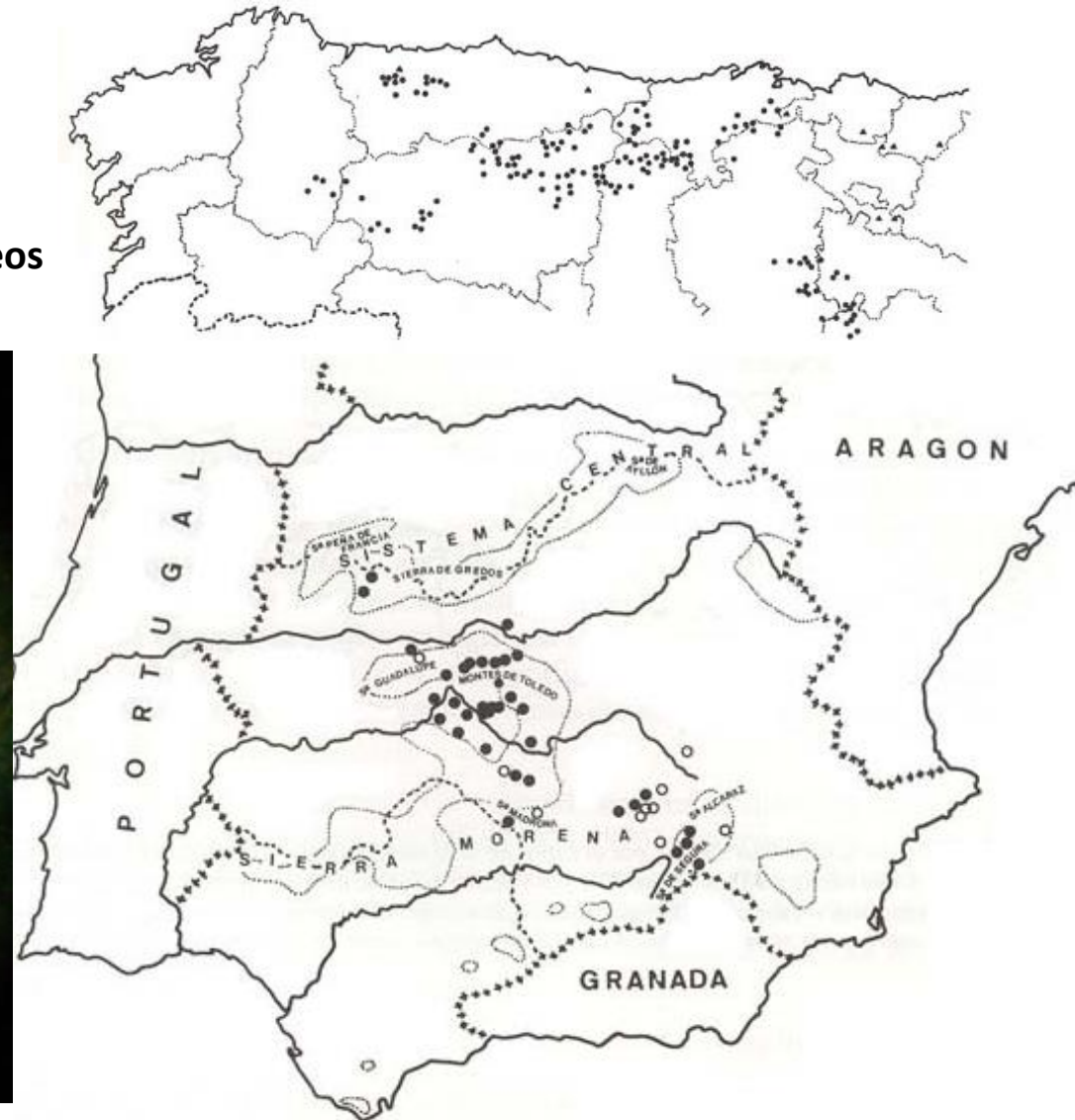


Declive brutal en N y en distribución en tiempos históricos y recientes

Libro de la Montería (XIV) y localidades de los siglos XVI y XVII (Nores y Naves 1993)

XIV-XVI: gran parte de la Península Ibérica

XVII-XVIII: sólo en el Norte; sep CC de Pirineos



Declive brutal en N y en distribución en tiempos históricos y recientes

Distribución del oso pardo en 1800 y 1900, según Naves y Nores (1999).

1800

14.000

1900

9.200

Bencatel et al. (2017).
Atlas de Mamíferos de Portugal



Declive brutal en N y en distribución en tiempos históricos y recientes

Distribución del oso pardo en 1800 y 1900, según Naves y Nores (1999).

1800

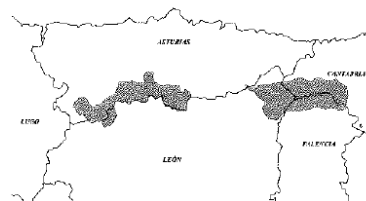
14.000

1900

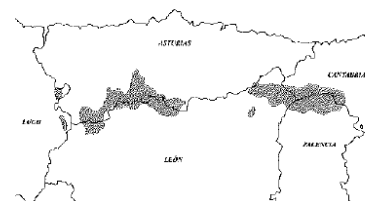
9.200

Distribución del oso pardo según diversos autores (décadas de los sesenta y setenta).

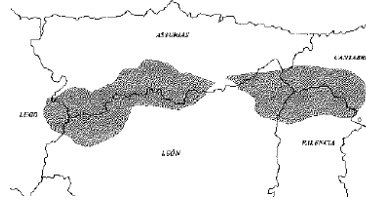
Según Notario (1964)



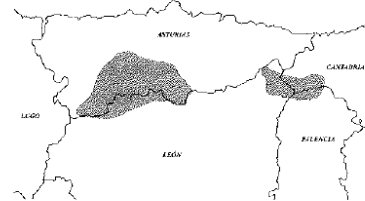
Según el SFCCPN (1968)



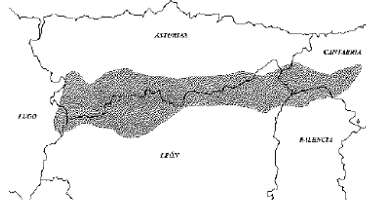
Según el Mir (1969)



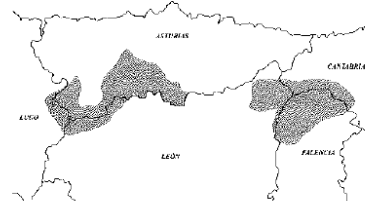
Según Braña *et al.* (1979)

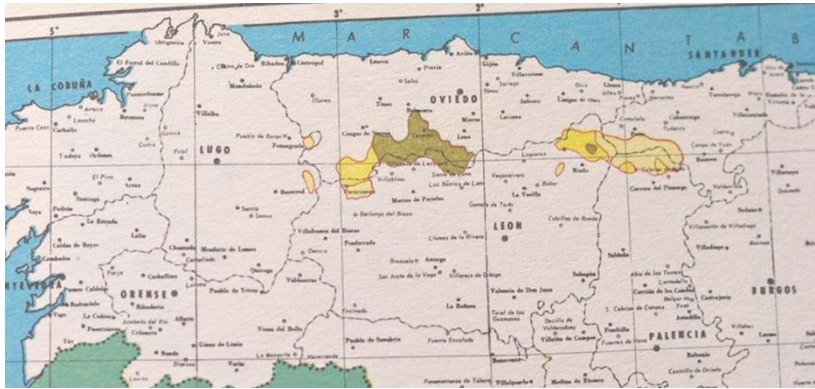


Según Garzón *et al.* (1980)



Según Notario (1980)

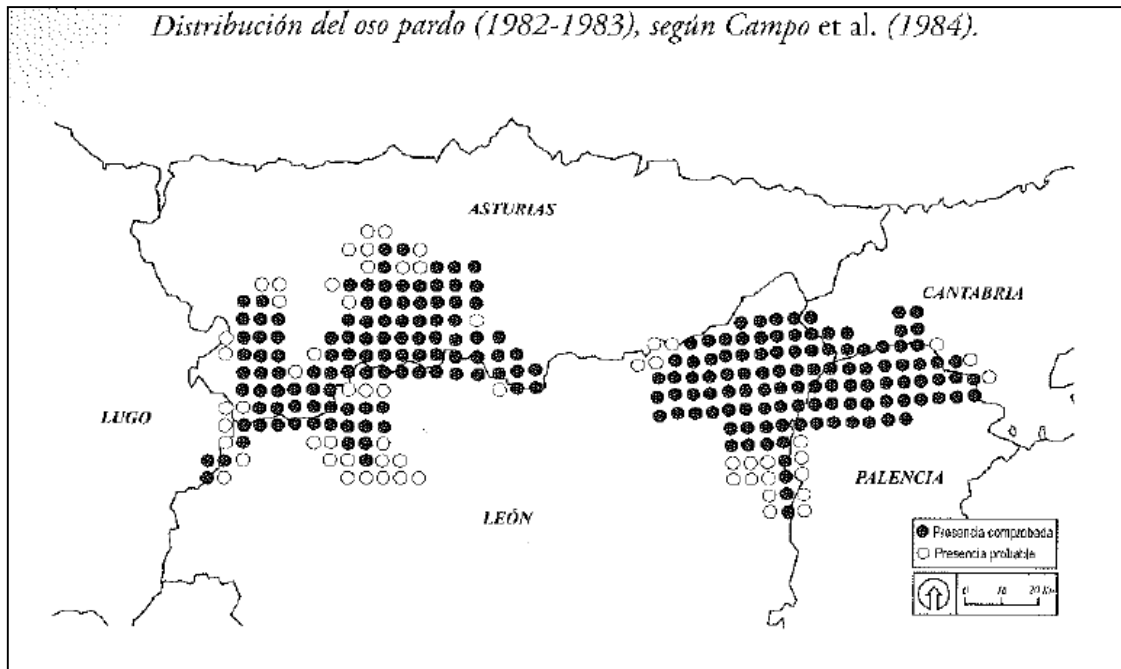




SPCCPN (1968)

6.975 : Comprobada + Probable (1.550)

Distribución del oso pardo (1982-1983), según Campo et al. (1984).

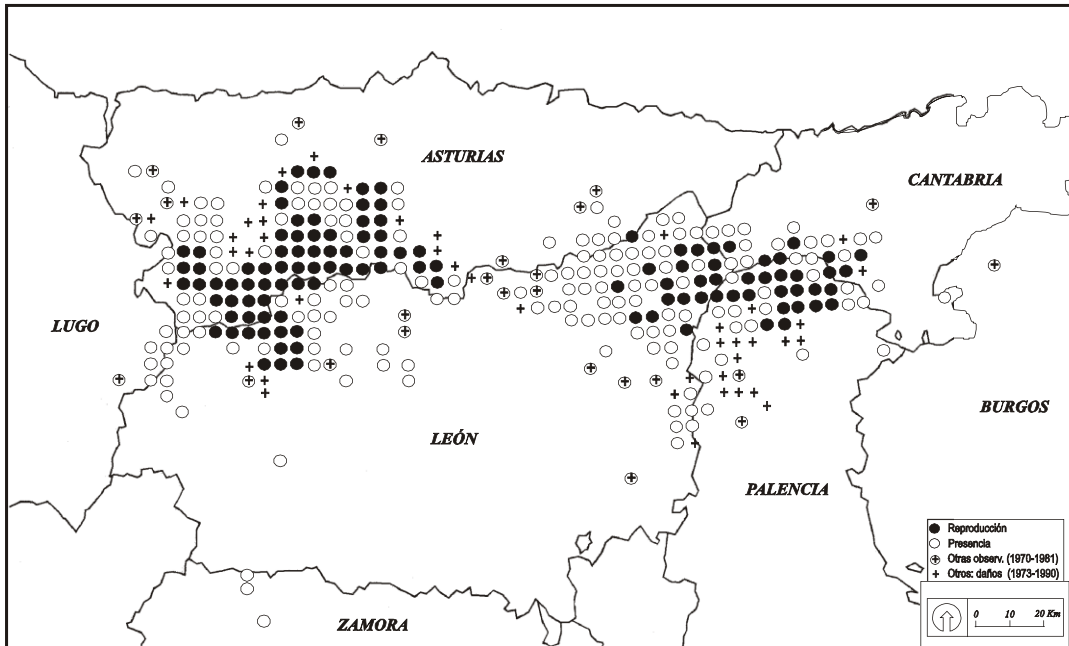


1982-1983 (Campo et al. 1984), 5x5 km grid

Virtual extinción de Pirineos y re-introducción

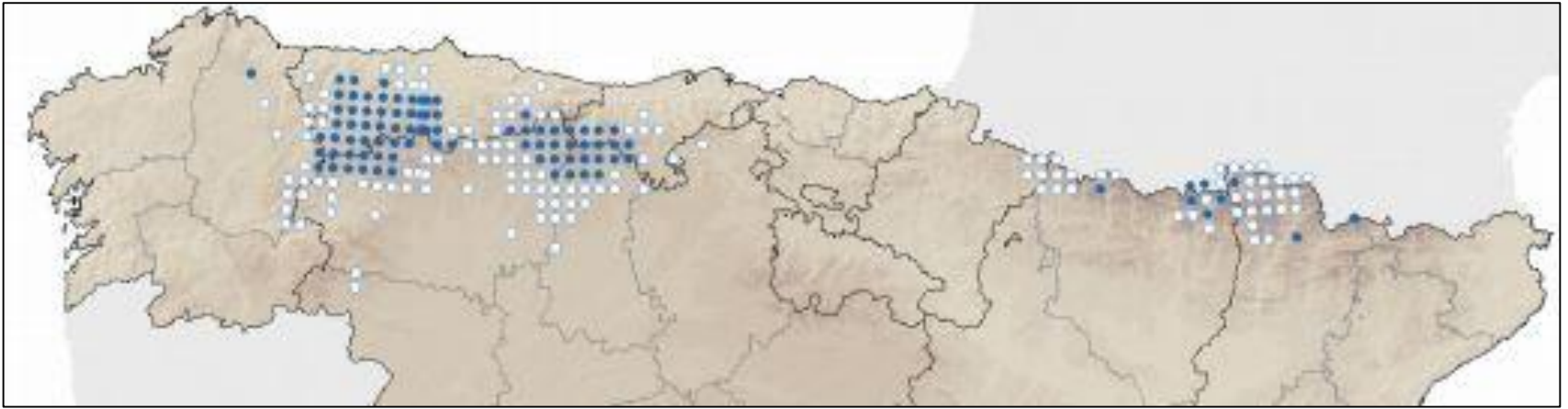


7.100 : Reproducción (2.825) + Presencia



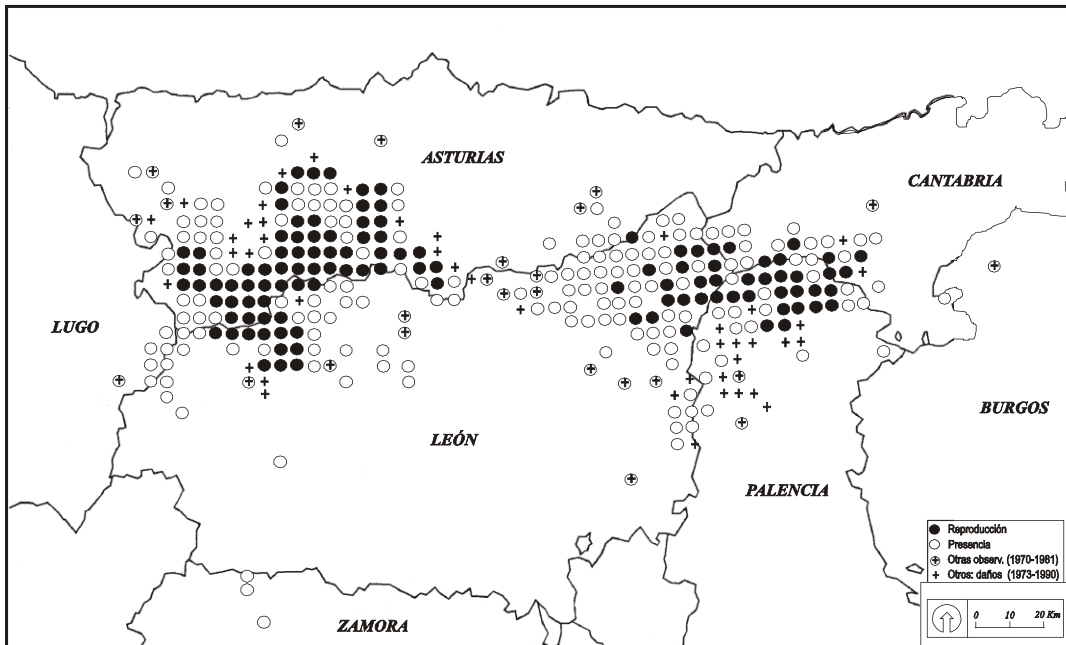
1982-1991 (Naves 1999), **5x5** km grid

16.700 : Reproducción (7.900) + Presencia (CC)



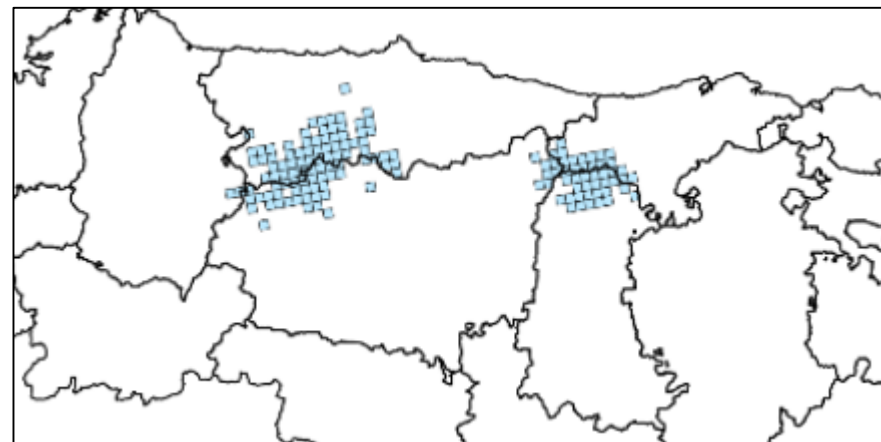
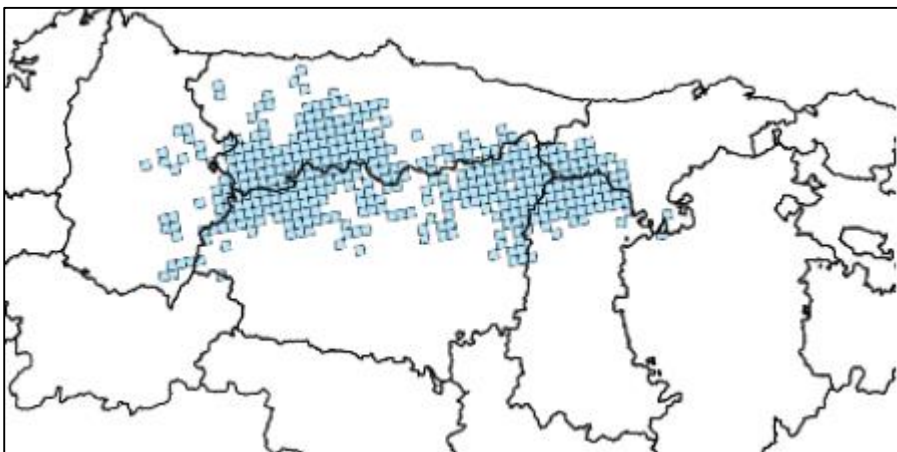
Naves & Fernández-Gil, En: Palomo et al. (2007): Atlas y Libro Rojo, **10x10** grid, 1980 – ap. 2005

7.100 : Reproducción (2.825) + Presencia



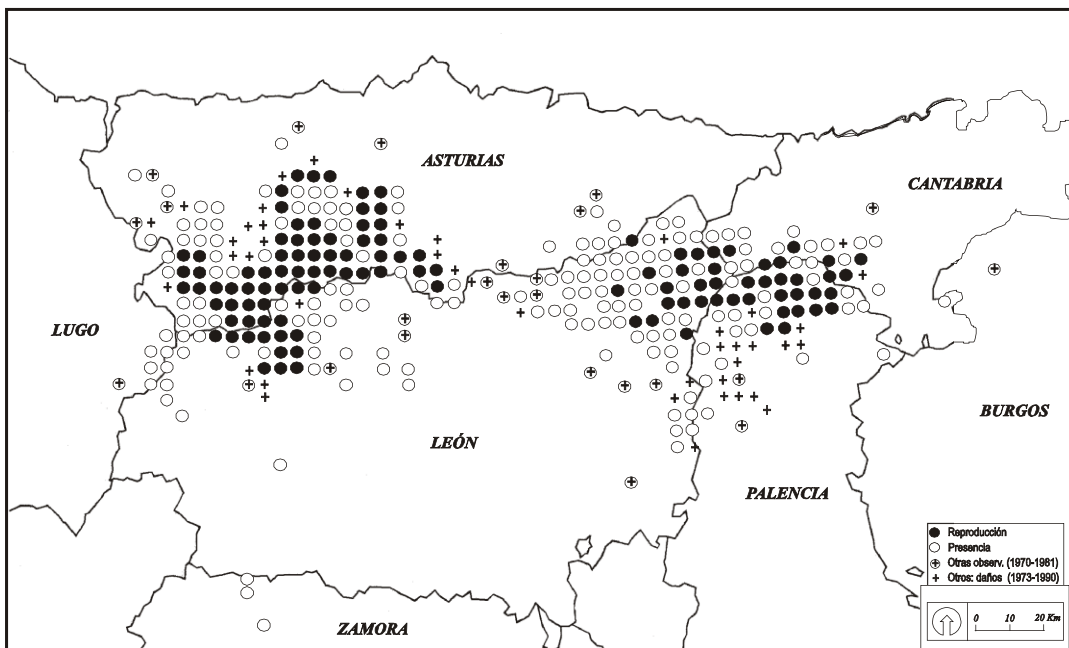
1982-1991 (Naves 1999), **5x5** km grid

10.425 : Reproducción (3.575) + Presencia



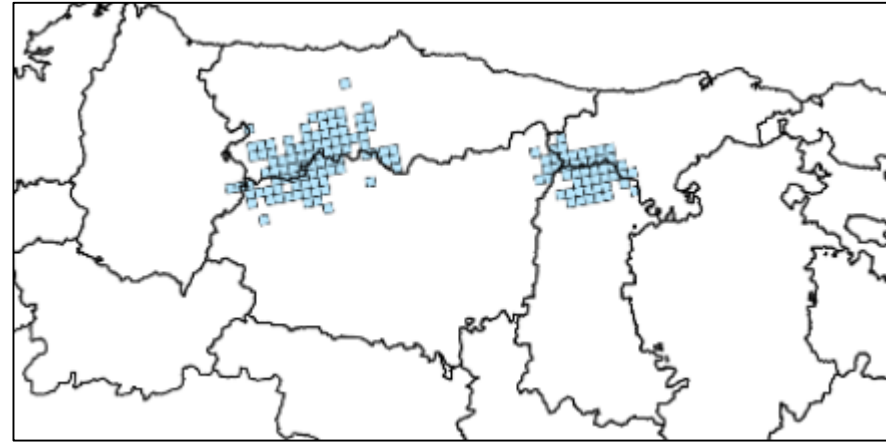
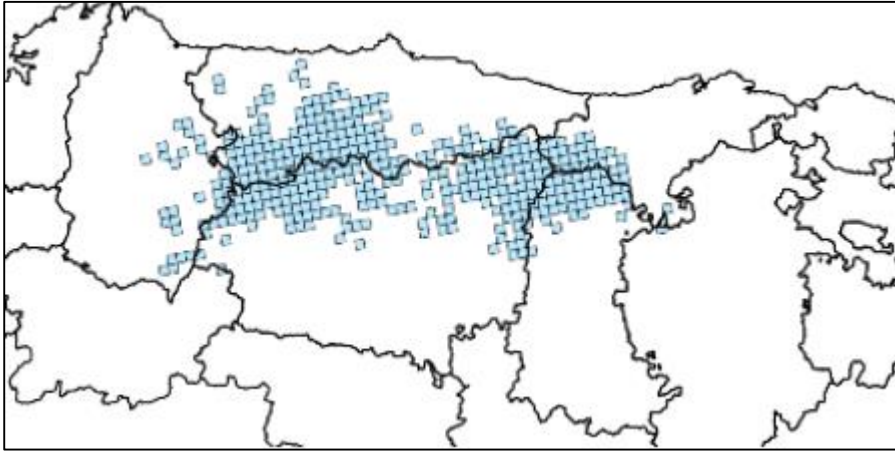
Díaz (2017): Patterns of Spatial Recovery of Cantabrian Brown Bears, 5x5 grid, 2003-2012

7.100 : Reproducción (2.825) + Presencia



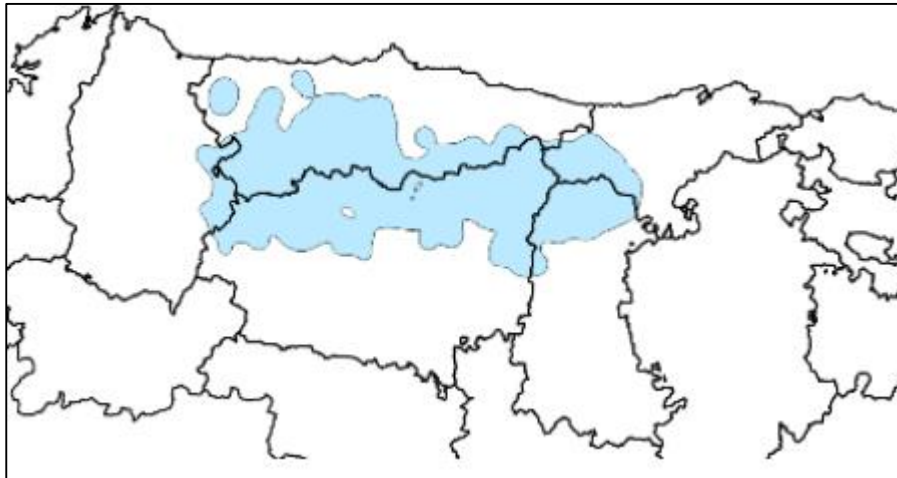
1982-1991 (Naves 1999), 5x5 km grid

10.425 : Reproducción (3.575) + Presencia



Díaz (2017): Patterns of Spatial Recovery of Cantabrian Brown Bears, **5x5** grid, 2003-2012

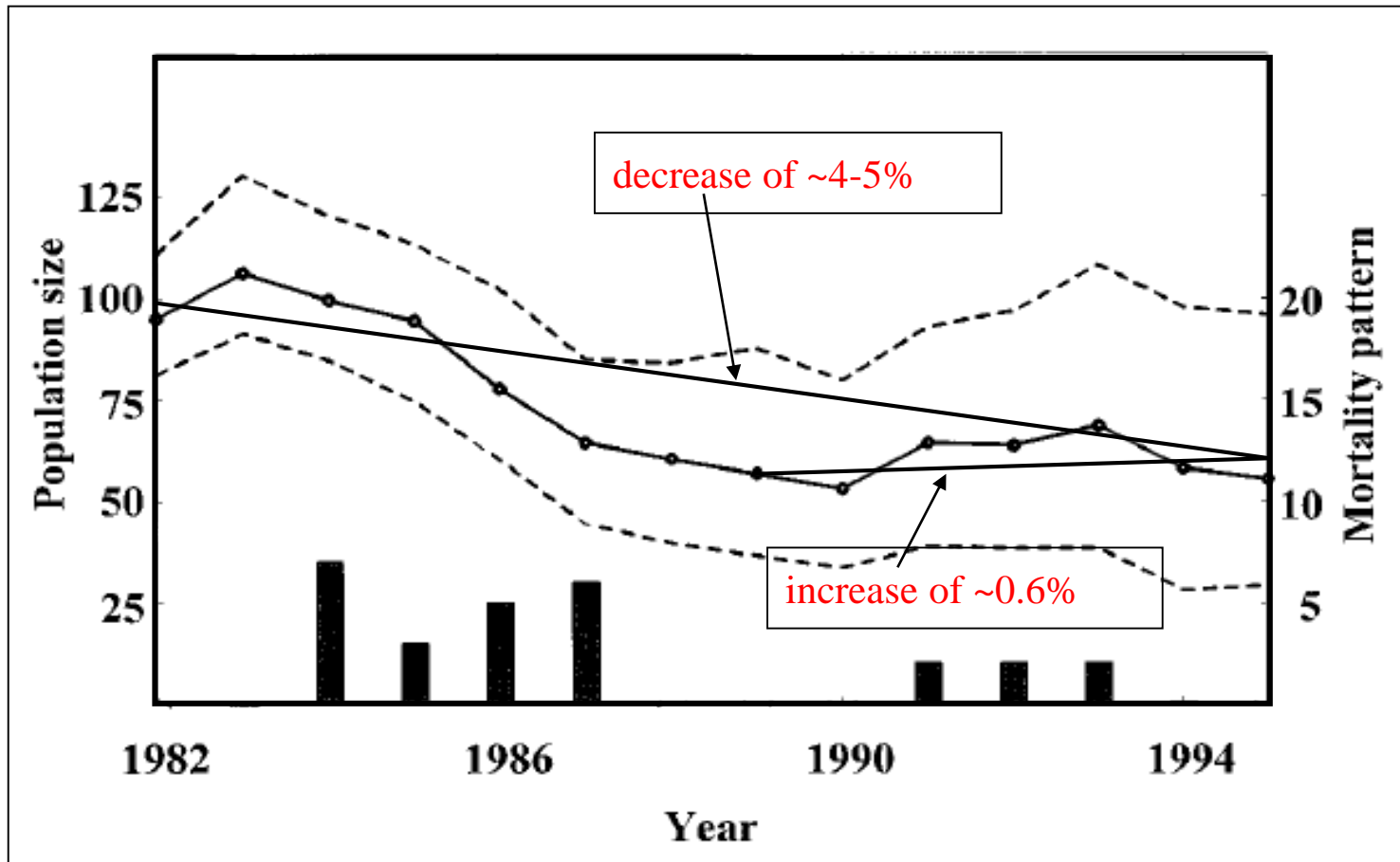
14.685 : Reproducción (6.378) + Presencia



Díaz (2017): Patterns of Spatial Recovery of Cantabrian Brown Bears, **KERNEL**, 2003-2012

ASSESSING THE RISK OF EXTINCTION FOR THE BROWN BEAR (*URSUS ARCTOS*) IN THE CORDILLERA CANTABRICA, SPAIN

THORSTEN WIEGAND,¹ JAVIER NAVES,² THOMAS STEPHAN,¹ AND ALBERTO FERNANDEZ²



PVA; parámetros más sensibles: tasas de mortalidad de hembras adultas y subadultas

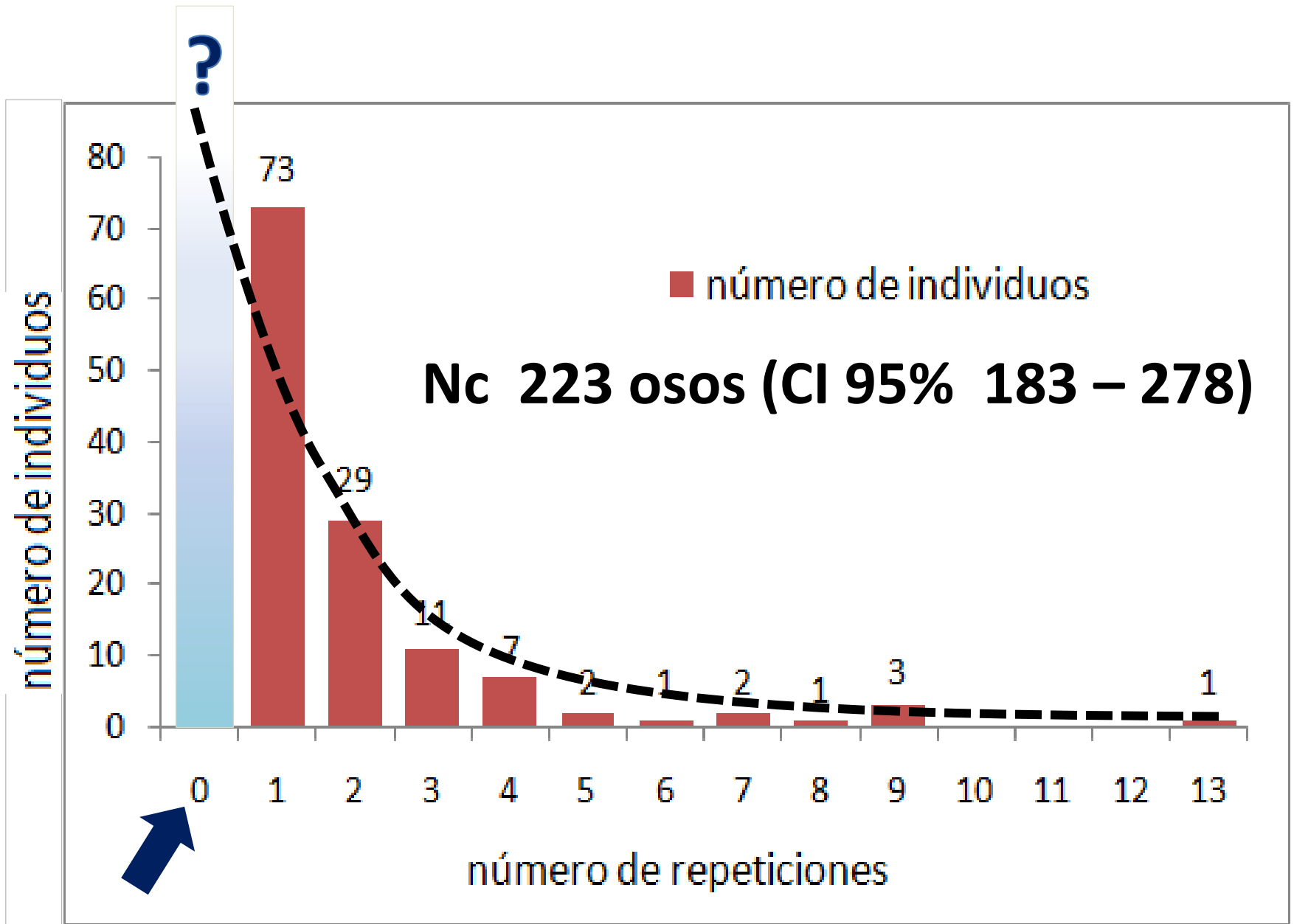


Wildlife Biology 20: 300–309, 2014

Estimating the population size of the endangered Cantabrian brown bear through genetic sampling

Trinidad Pérez, Javier Naves, José Fernando Vázquez, Alberto Fernández-Gil, Juan Seijas, Jesús Albornoz, Eloy Revilla, Miguel Delibes and Ana Domínguez

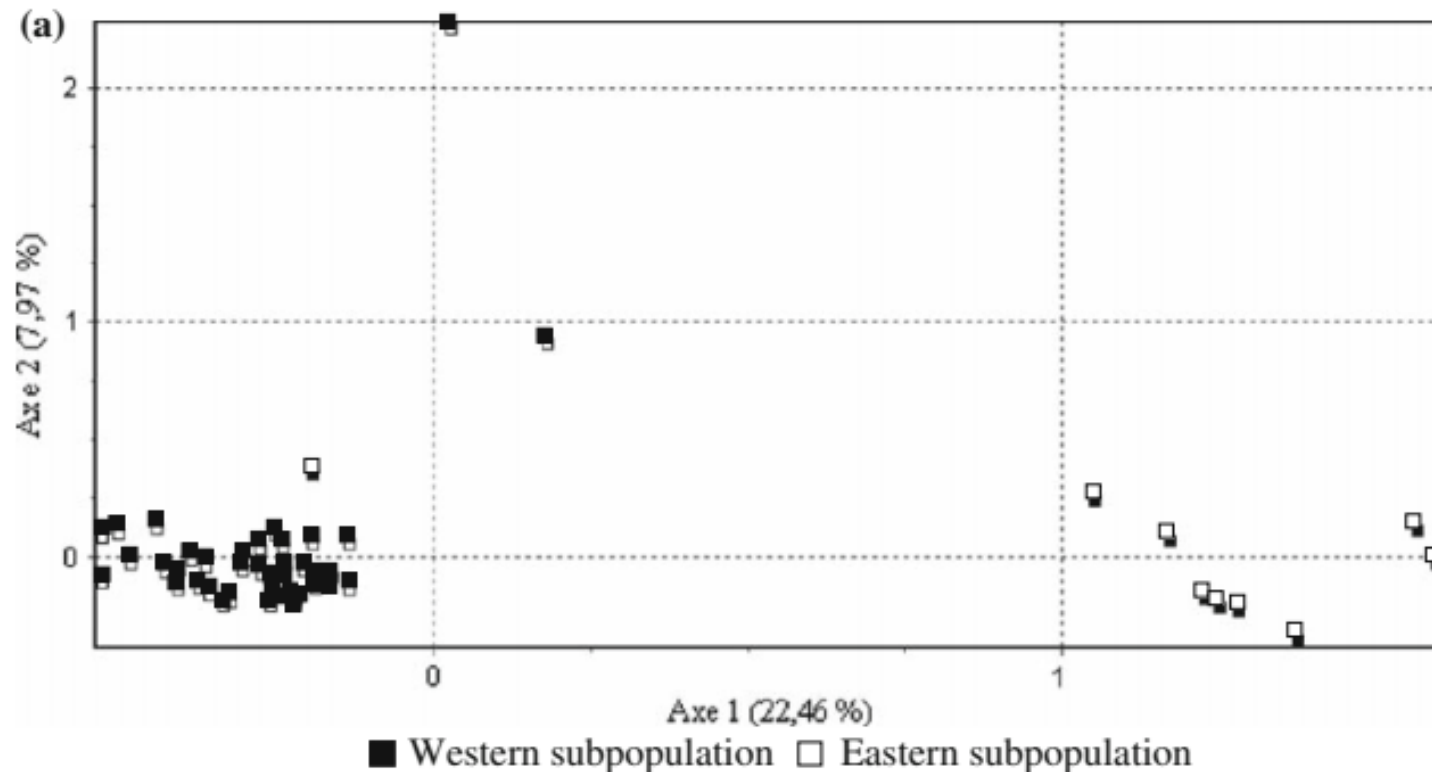




270 muestras genotipadas; 130 individuos

Non-invasive genetic study of the endangered Cantabrian brown bear (*Ursus arctos*)

Trinidad Pérez · Fernando Vázquez · Javier Naves ·
Alberto Fernández · Ana Corao · Jesús Albornoz ·
Ana Domínguez



“both subpopulations have been isolated for 10 generations (50-75 years)”

Evidence for improved connectivity between Cantabrian brown bear subpopulations

Trinidad Pérez¹, Javier Naves^{2,3}, José Fernando Vázquez¹, Juan Seijas⁴, Ana Corao¹, Jesús Albornoz¹, and Ana Domínguez^{1,5}

Ursus 21(1):104–108 (2010)

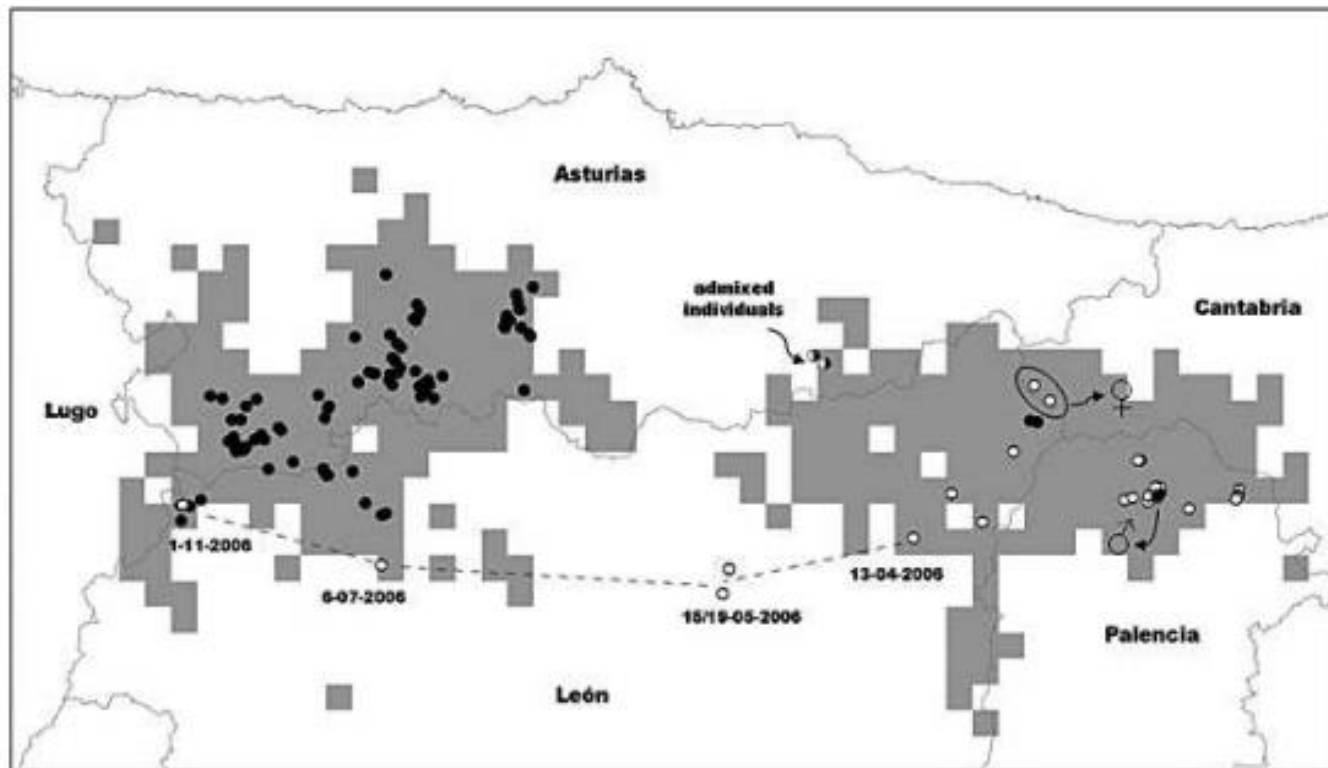


Fig. 2. Distribution of brown bears and location of the samples genotyped in the eastern (white) and western (black) subpopulations in the Cantabrian Mountains (based on Naves et al. 2003; each cell represents a square of 5 x 5 km), 2004–07. Admixed individuals are represented by black and white circles. The inferred mother and father of admixed individuals are marked. Samples corresponding to one migrant individual are connected with a dashed line.

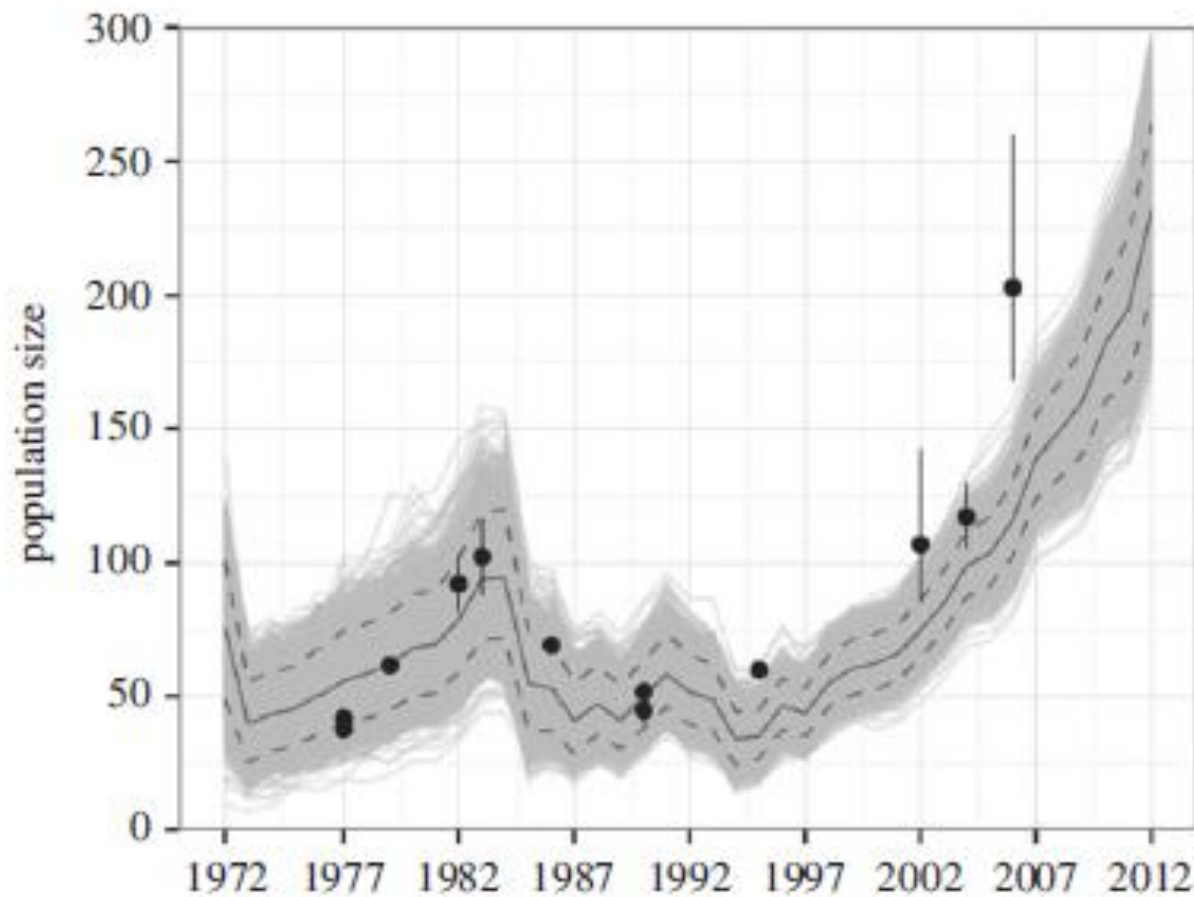


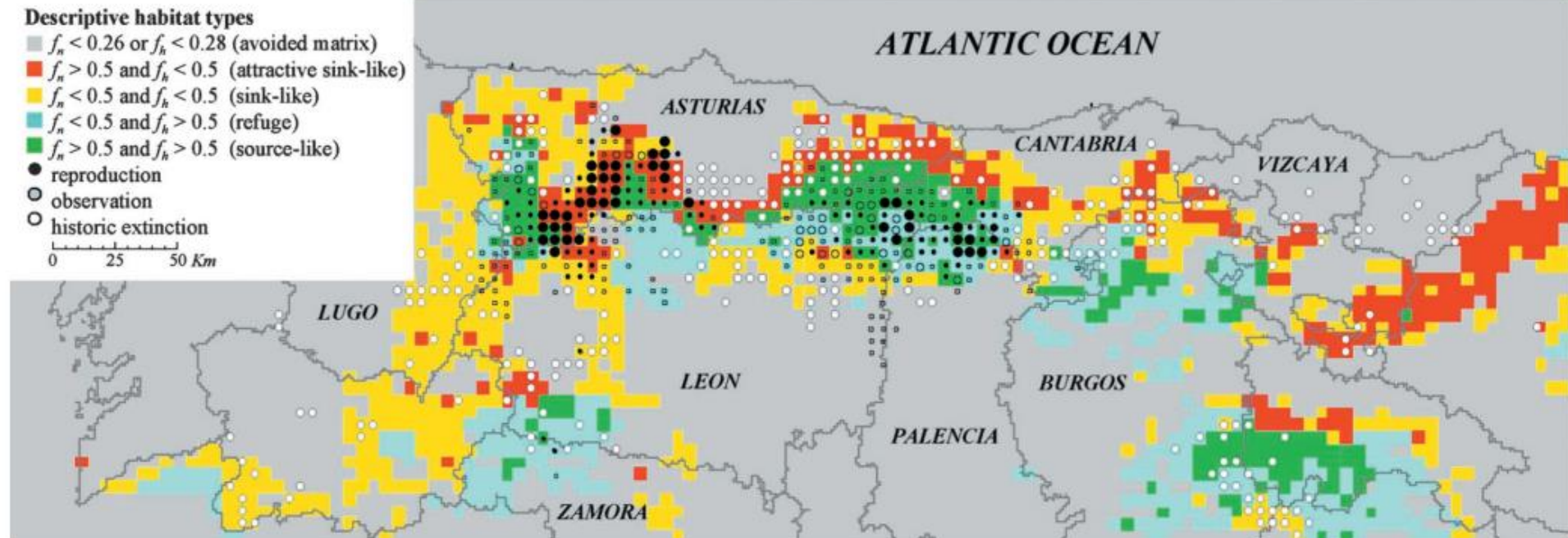
Figure 2. Historical abundance estimates of the brown bear western sub-population. Grey lines and shaded areas represent, respectively, the median and 90% Bayesian credible intervals derived from samples of the posterior distribution of the AbEn model. Dots and error bars correspond to population size estimates based on surveys, direct observations, number of *Fcay*, modelling and genetic analyses (see references in electronic supplementary material, table B1).

Decline and recovery of a large carnivore: environmental change and long-term trends in an endangered brown bear population

Isabel Martínez Cano^{1,†}, Fernando González Taboada², Javier Naves¹, Alberto Fernández-Gil¹ and Thorsten Wiegand³

Proc. R. Soc. B **283**: 20161832.

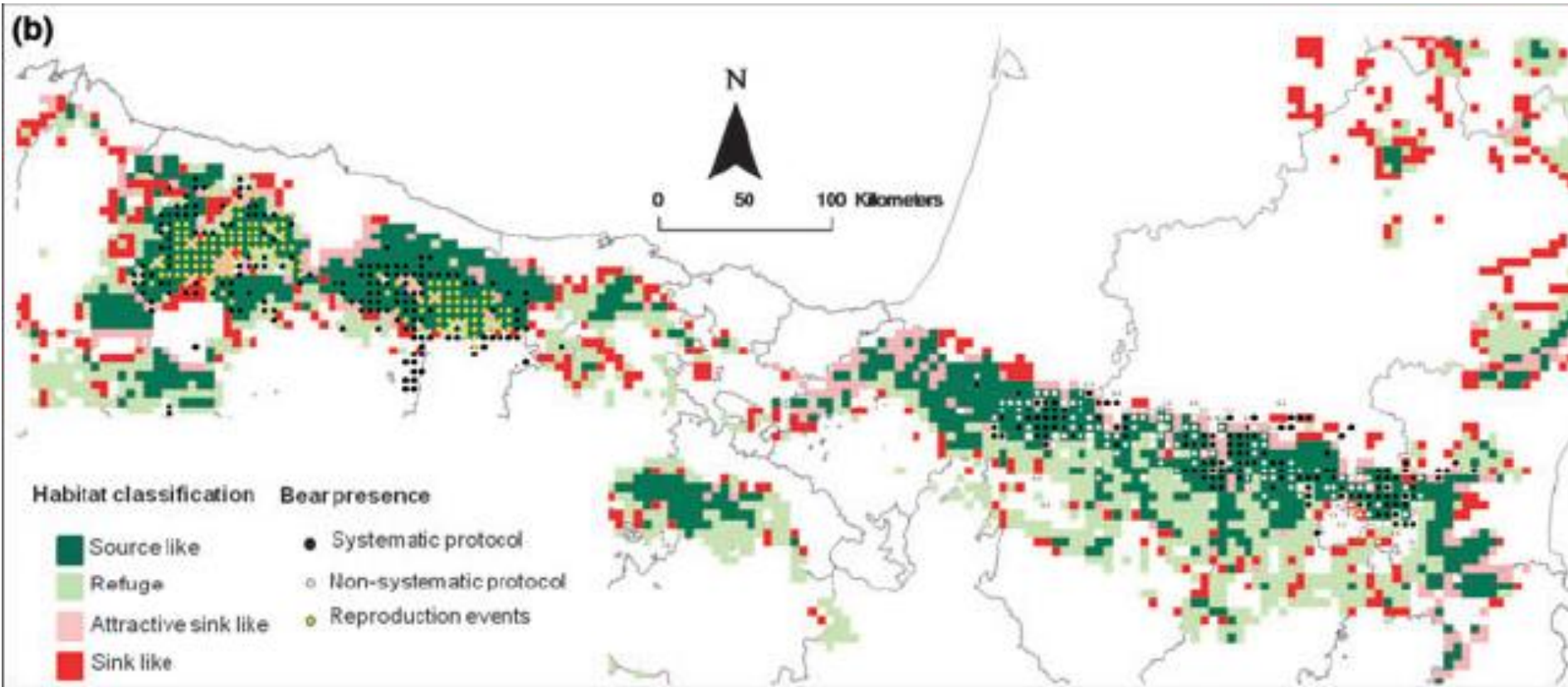
<http://dx.doi.org/10.1098/rspb.2016.1832>

a

Endangered Species Constrained by Natural and Human Factors: the Case of Brown Bears in Northern Spain

Conservation Biology, Pages 1276–1289
Volume 17, No. 5, October 2003

JAVIER NAVES,* THORSTEN WIEGAND,† ELOY REVILLA,*†‡ AND MIGUEL DELIBES*



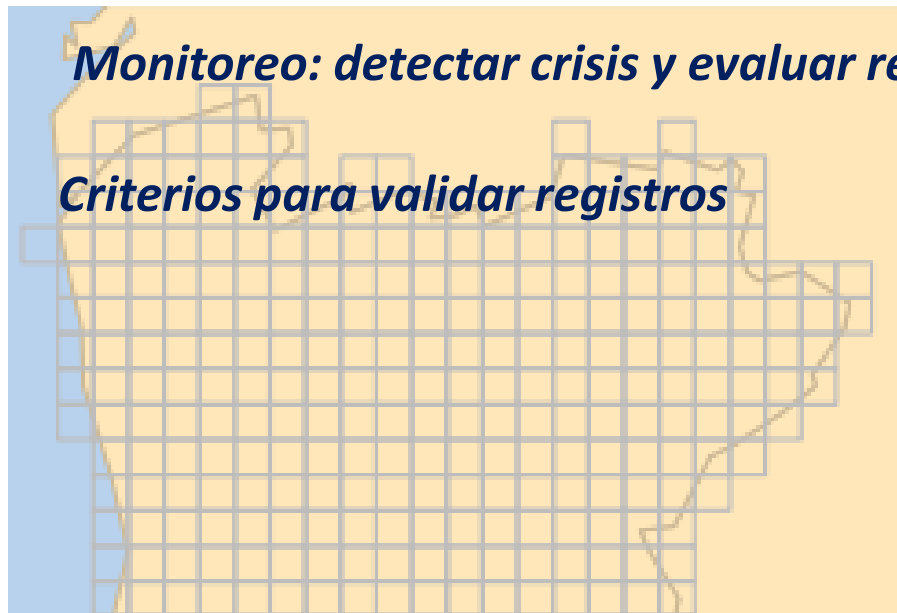
**Brown bear habitat suitability in the Pyrenees:
transferability across sites and linking scales to make
the most of scarce data**

Jodie Martin^{1,2,3,4*}, Eloy Revilla⁵, Pierre-Yves Quenette³, Javier Naves⁵, Dominique Allainé¹ and Jon E. Swenson^{2,6}

Monitoreo: detectar crisis y evaluar recuperación

Criterios para validar registros





Monitoreo: detectar crisis y evaluar recuperación

Crterios para validar registros



Distribución y Abundancia

- ***Presencia y Reproducción***
- ***Sistemático vs Oportunista***
- ***Daños a colmenas, frutales, ganado***

Ecología Trófica (Key-Apex)



Item	% of volume	Whole Area
<i>Quercus</i>	16%	- 0.04
<i>Vaccinium</i>	11%	-0.01
Animal	11%	+0.04
<i>Malus</i>	7%	NS
<i>Rhamnus</i>	7%	- 0.04
Graminoids	7%	- 0.05
<i>Castanea</i> ¹	7%	NS
<i>Prunus</i>	7%	+0.17
Forbs	7%	- 0.05
<i>Corylus</i>	6%	+0.04
<i>Rubus</i>	3%	NS
<i>Sorbus</i>	3%	NS

Hyperphagia (1974-2003)

Long-term trends in food habits of a relict brown bear population in northern Spain: the influence of climate and local factors

C. RODRÍGUEZ^{1,2*}, J. NAVES^{1,2}, A. FERNÁNDEZ-GIL^{1,2}, J.R. OBESO¹ AND M. DELIBES²

The role of the brown bear *Ursus arctos* as a legitimate megafaunal seed disperser

Alberto García-Rodríguez^{1✉}, Jörg Albrecht², Sylwia Szczutkowska³, Alfredo Valido⁴, Nina Farwig⁵ & Nuria Selva¹

Scientific Reports | (2021) 11:1282

| <https://doi.org/10.1038/s41598-020-80440-9>

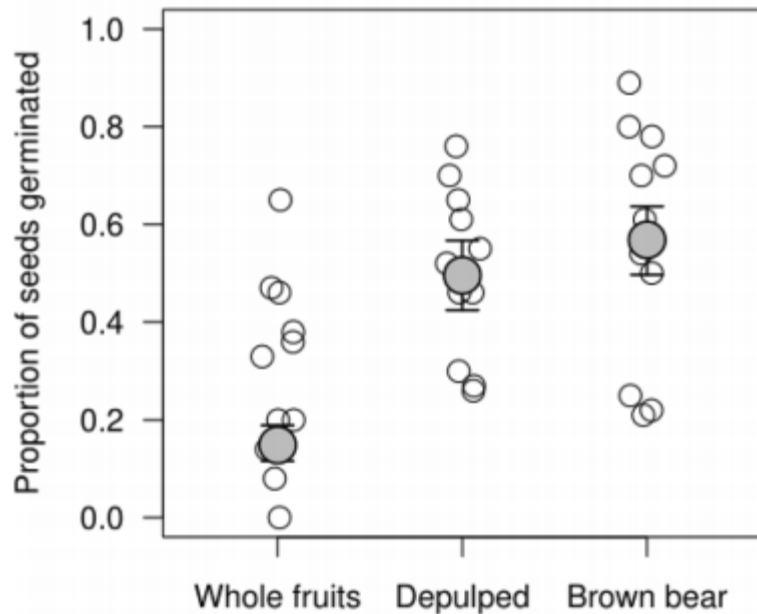






Foto: A. García-Rodríguez



diversity

Article

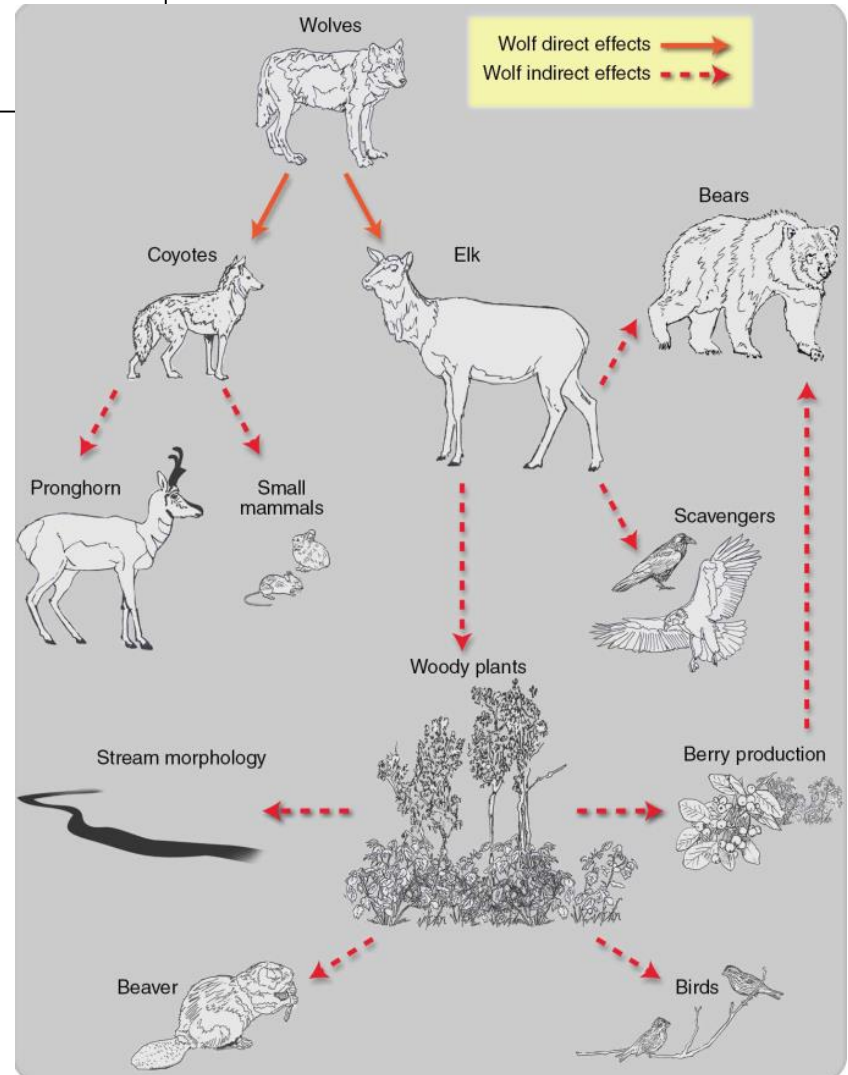
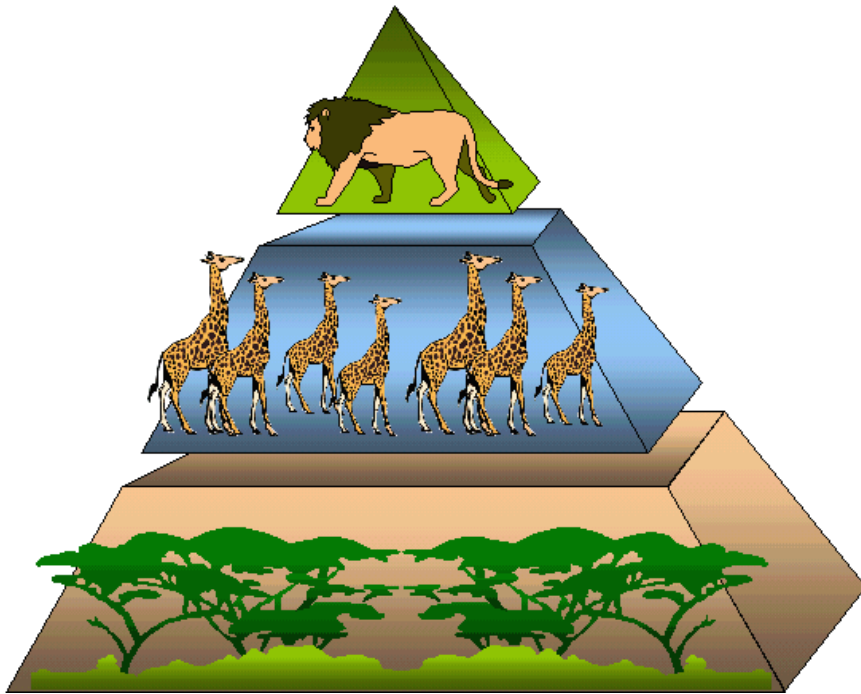
Individual Variation in Predatory Behavior, Scavenging and Seasonal Prey Availability as Potential Drivers of Coexistence between Wolves and Bears

Andrés Ordiz ^{1,2,3,*} , Cyril Milleret ¹, Antonio Uzal ³ , Barbara Zimmermann ⁴, Petter Wabakken ⁴, Camilla Wikenros ² , Håkan Sand ², Jon E Swenson ¹ and Jonas Kindberg ^{5,6} 

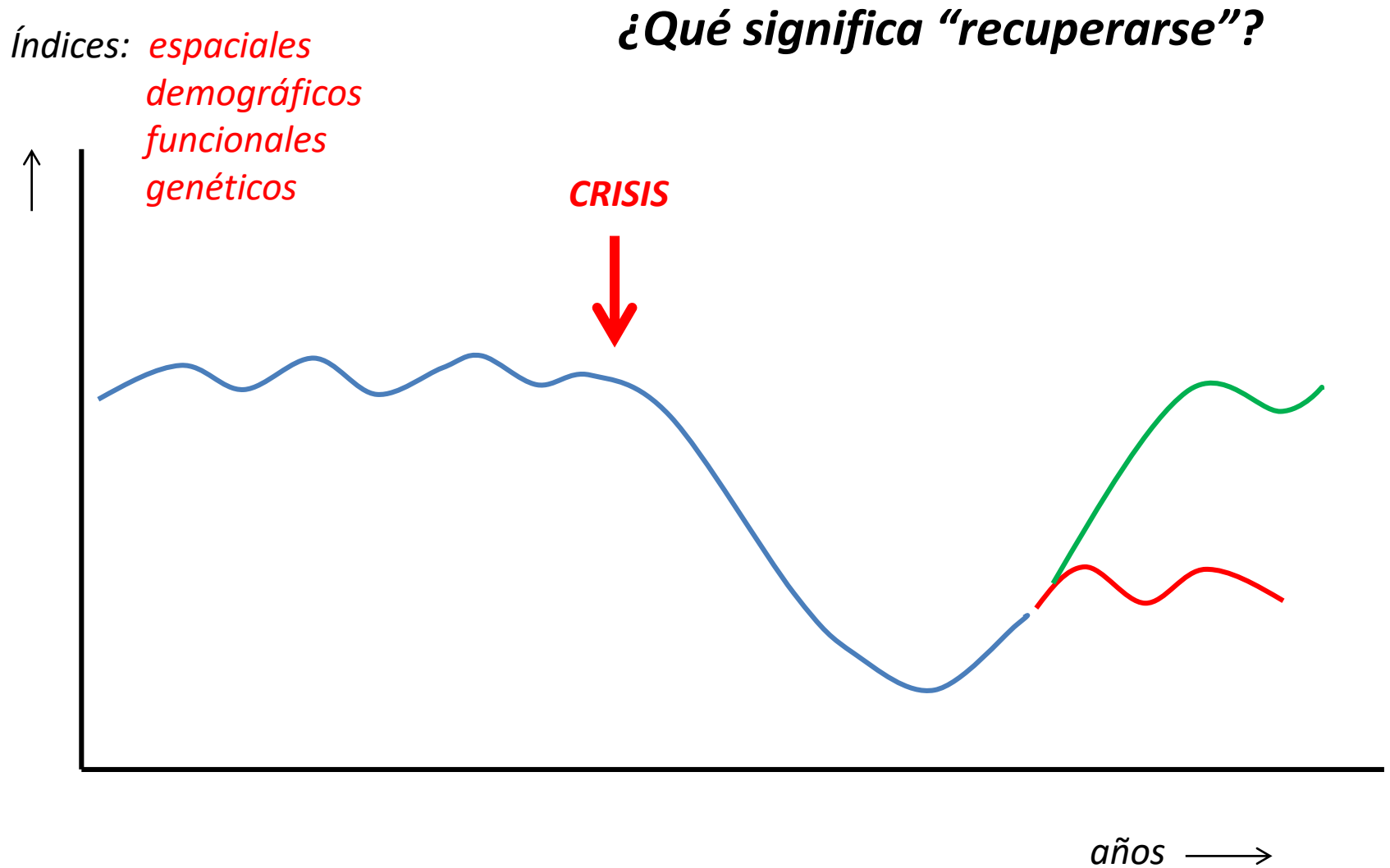


What is an apex predator?

Arian D. Wallach, Ido Izhaki, Judith D. Toms, William J. Ripple and Uri Shanas



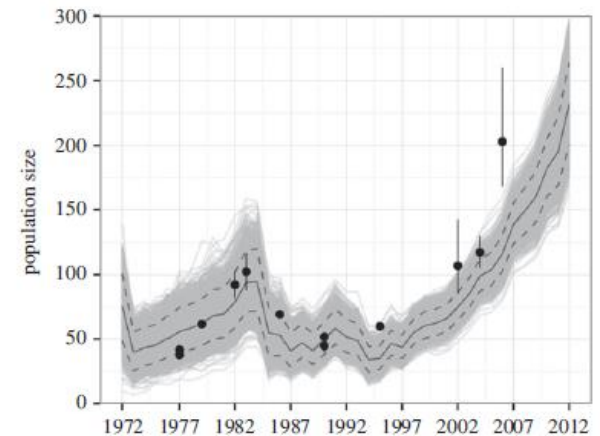
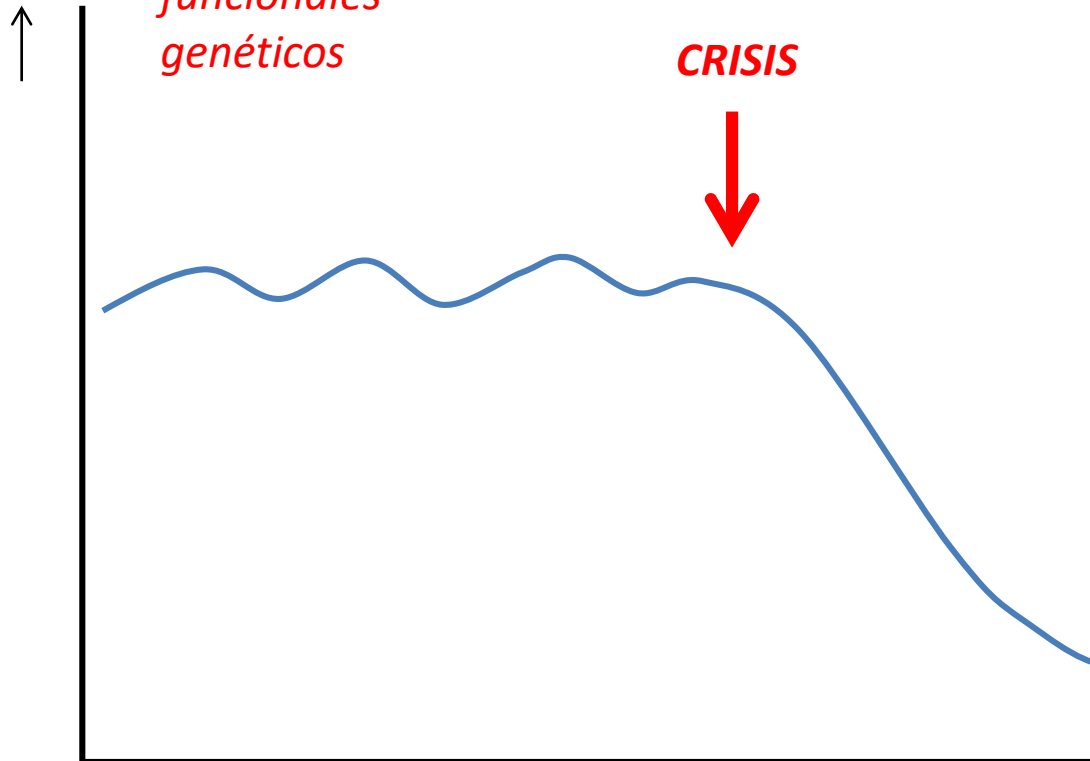
Objetivos: detectar crisis y evaluar recuperación



Objetivos: detectar crisis y evaluar recuperación

Índices: *espaciales*
demográficos
funcionales
genéticos

¿Qué significa “recuperarse”?

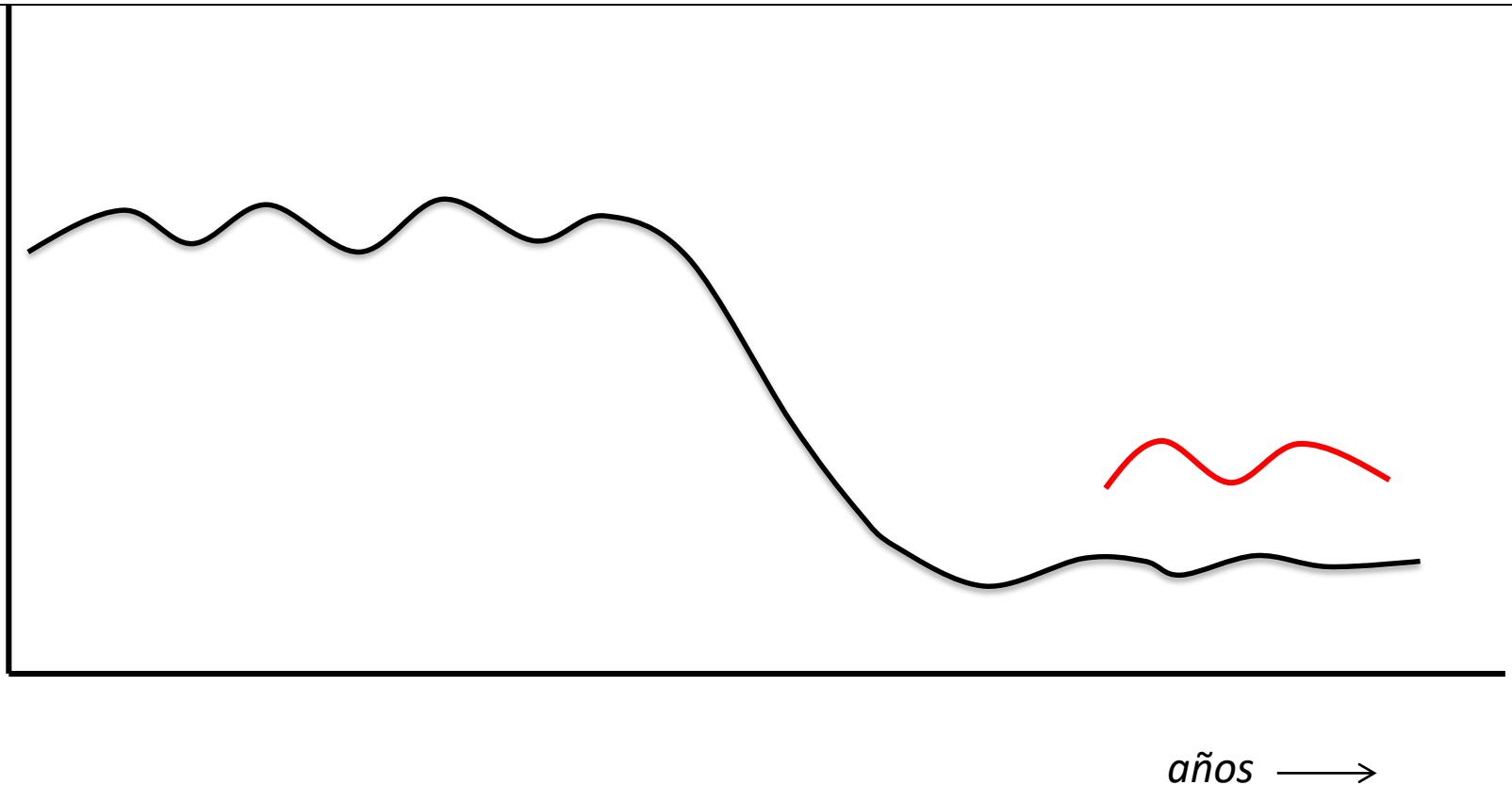


años →

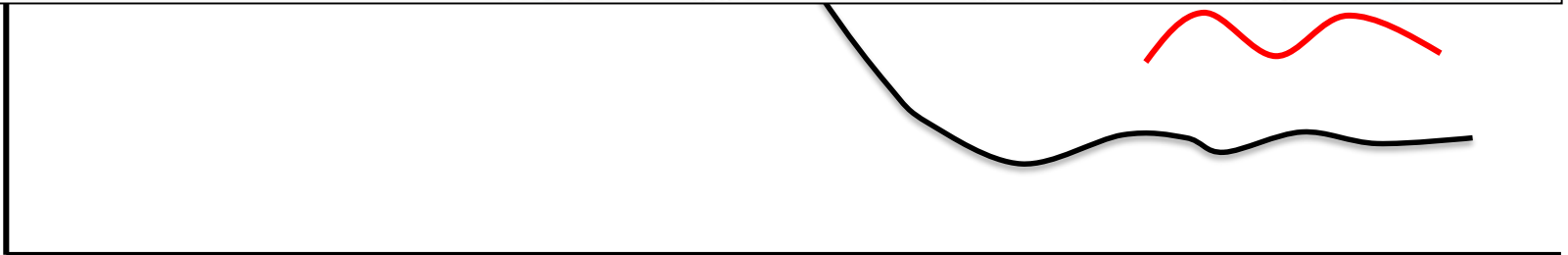
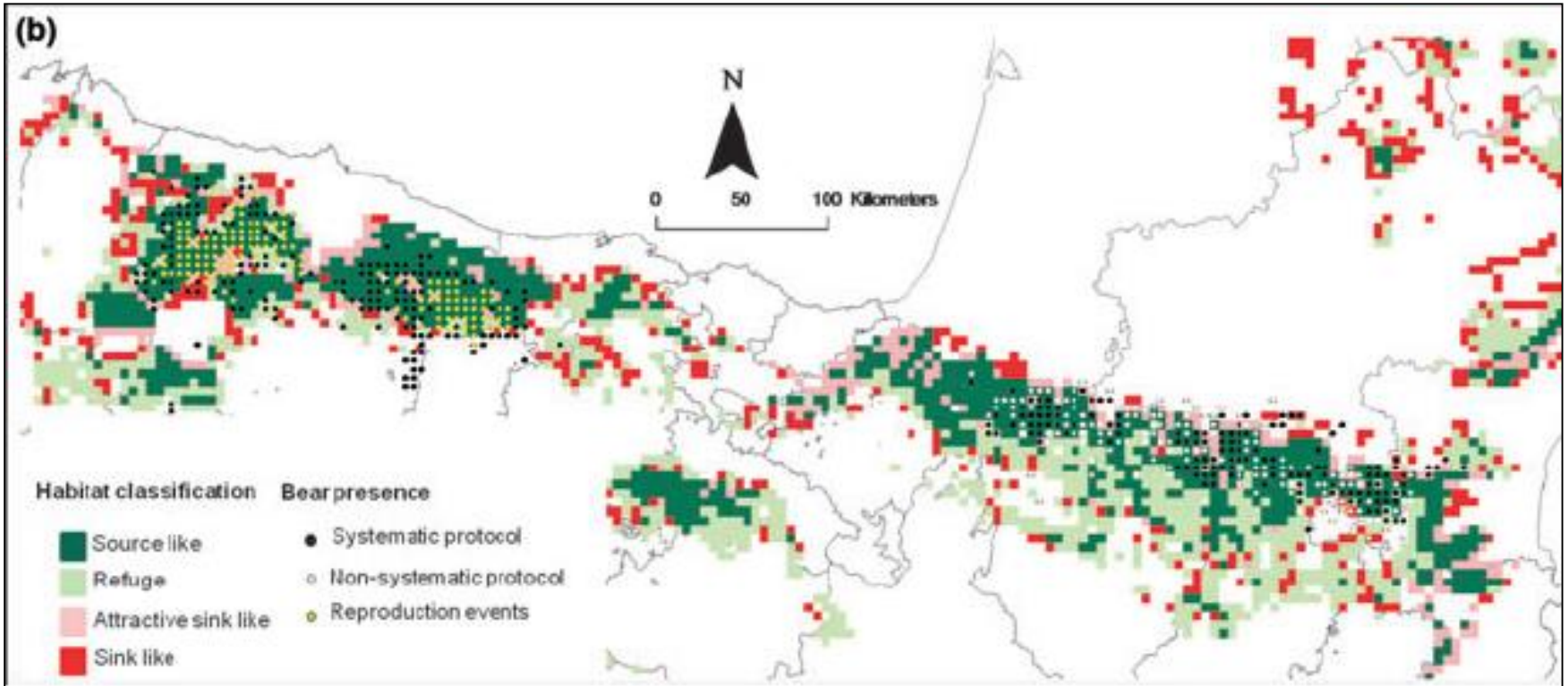
LETTER

Evidence for shifting baseline syndrome in conservation

S.K. Papworth¹, J. Rist², L. Coad³, & E.J. Milner-Gulland⁴



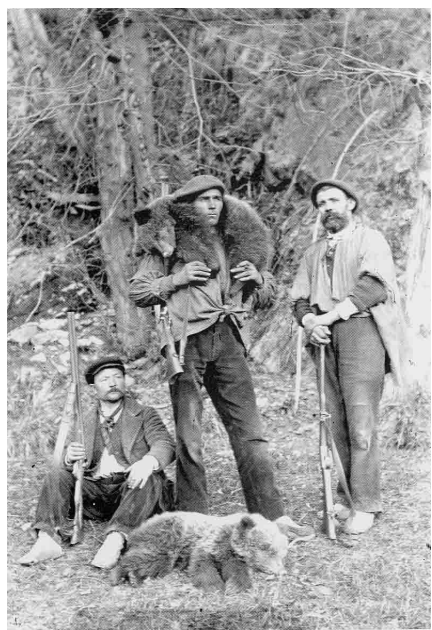
Objetivos: detectar crisis y evaluar recuperación



años →

*¿Se están recuperando los **grandes predadores ibéricos**?*

¿Las causas de la mejoría?



¿Se están recuperando los **grandes predadores ibéricos**?



¿Las causas de la mejoría...?



***Objetivos irrenunciables en conservación:
recuperación (habitat disponible) y función ecológica***



Gracias !!

*Al personal de Palombar y a ICNF
por impulsar este seminario*

