

CONSERVATION CHALLENGES FOR MEDITERRANEAN GYPSOPHYTES

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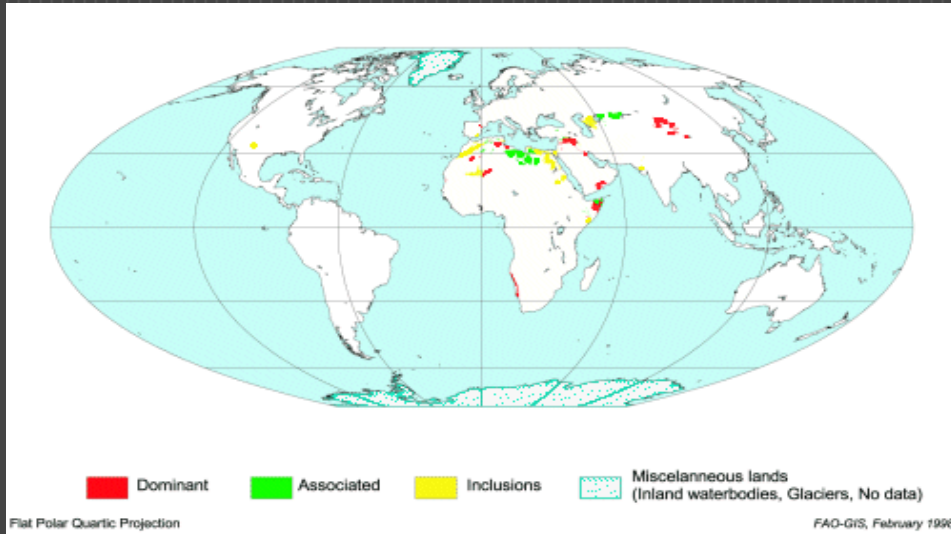
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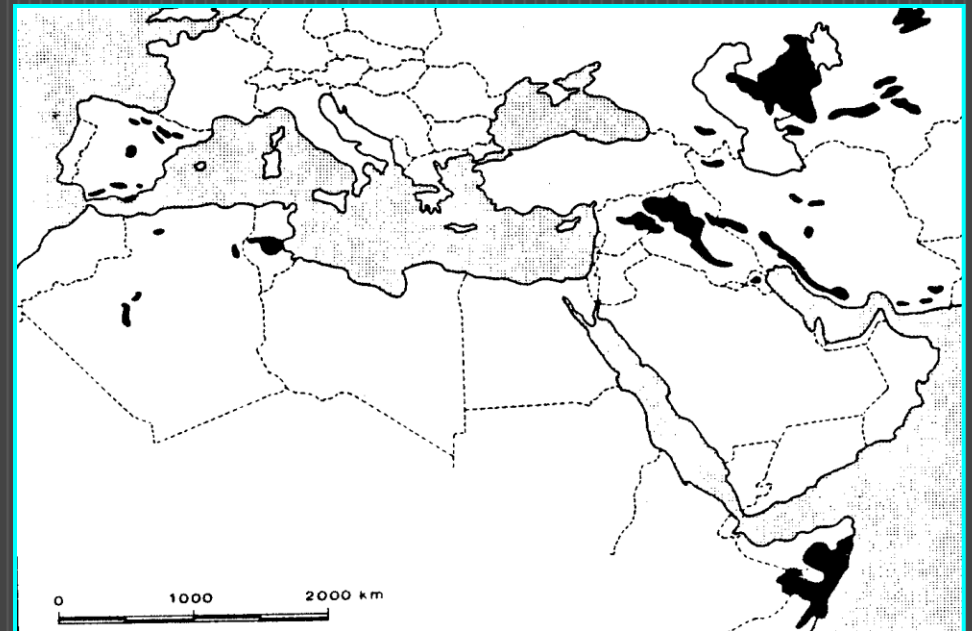


Distribution of gypsum outcrops

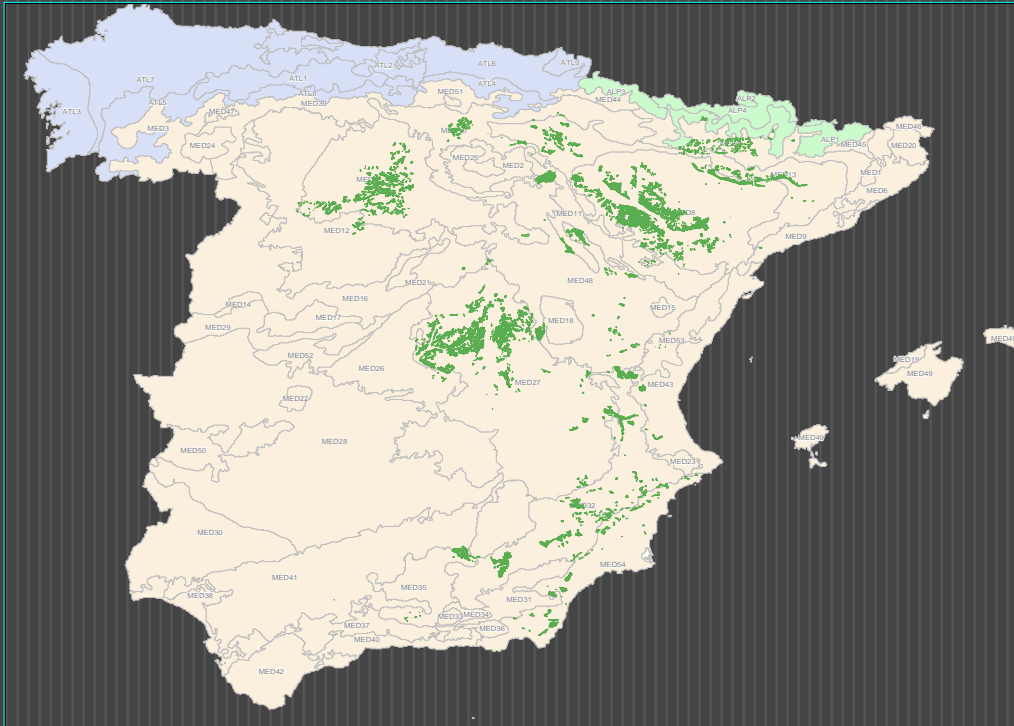


- Gypsiferous soils in the World ($\approx 850,000 \text{ km}^2$)

- Outcrops around the Mediterranean basin



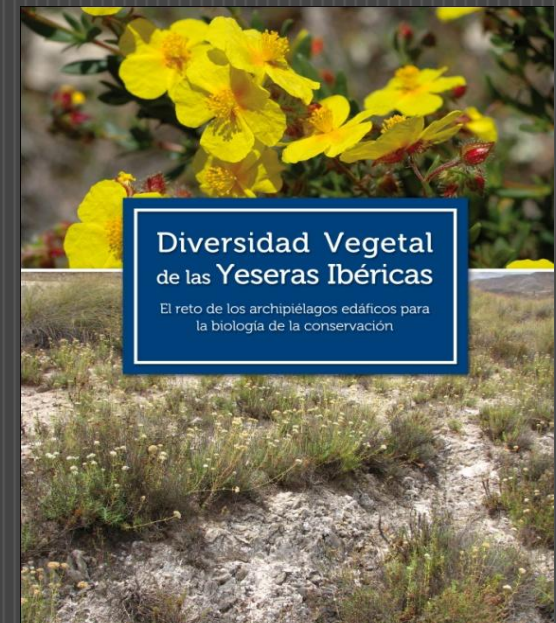
Gypsophytes in Iberia



- Priority areas for conservation in Europe (Source: Habitats of Spain, Ministry of Environment)

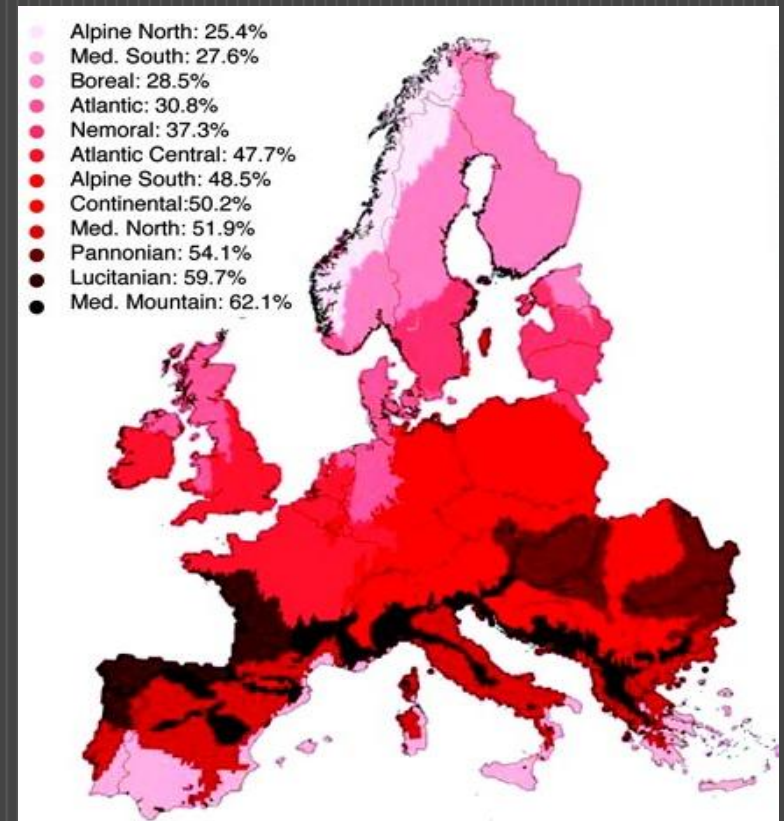
Mota, Gómez & Guirado (2011):

- 77 gypsophilous taxa
≈ 70 gypsovags taxa



- Climate Change: more than 50% of the European vascular plants will be threatened by 2080

- Spatial sensitivity of plant diversity in Europe to ranked by biogeographic regions



Thuiller *et al.* (2005) PNAS 102: 8245-8250

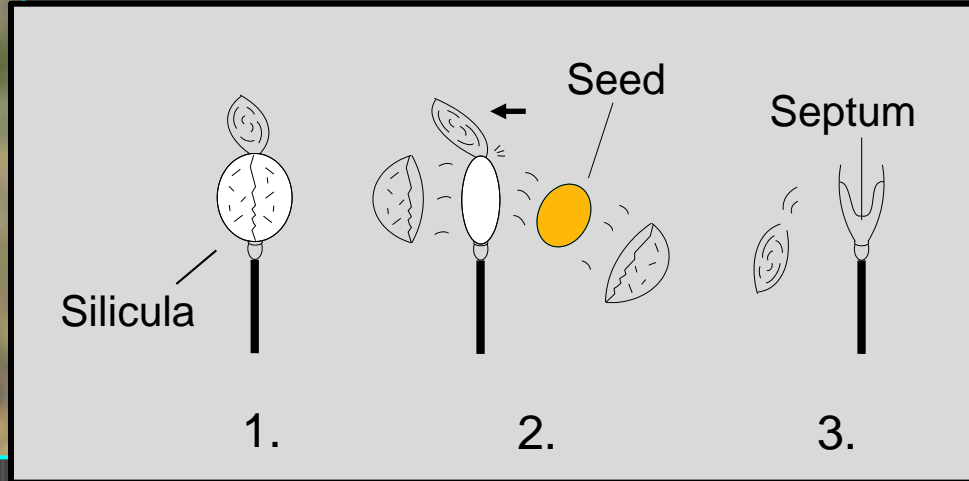
PNAS

Vella pseudocytisus L. (Brassicaceae)

- Endemic genus of W Mediterranean
- Shrub up to 100 cm high
- Facultative summer-deciduous
- High levels of genetic diversity

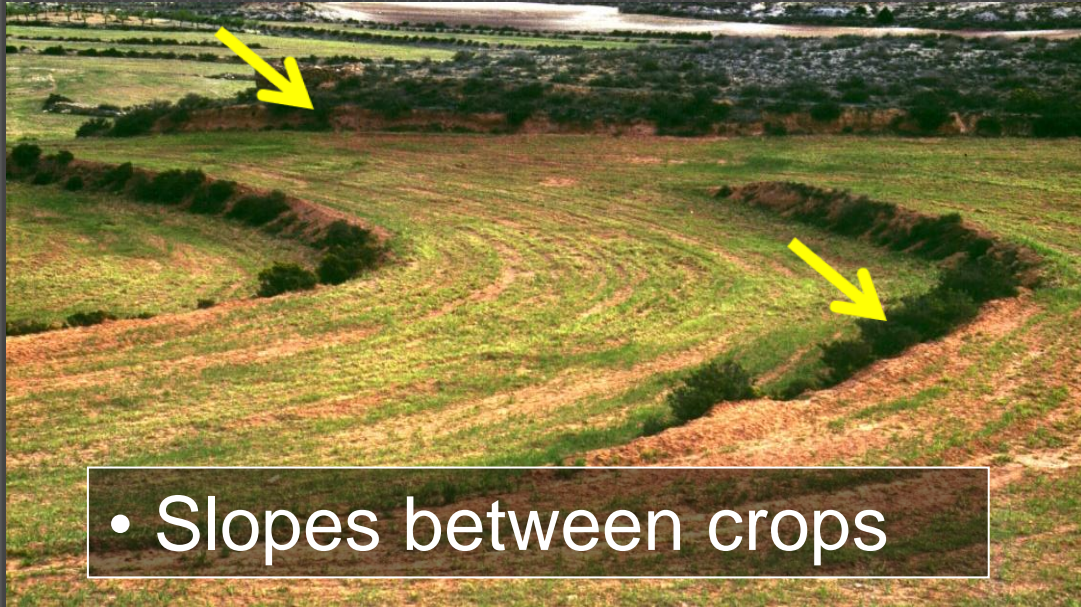


- Passive ballistic dispersal

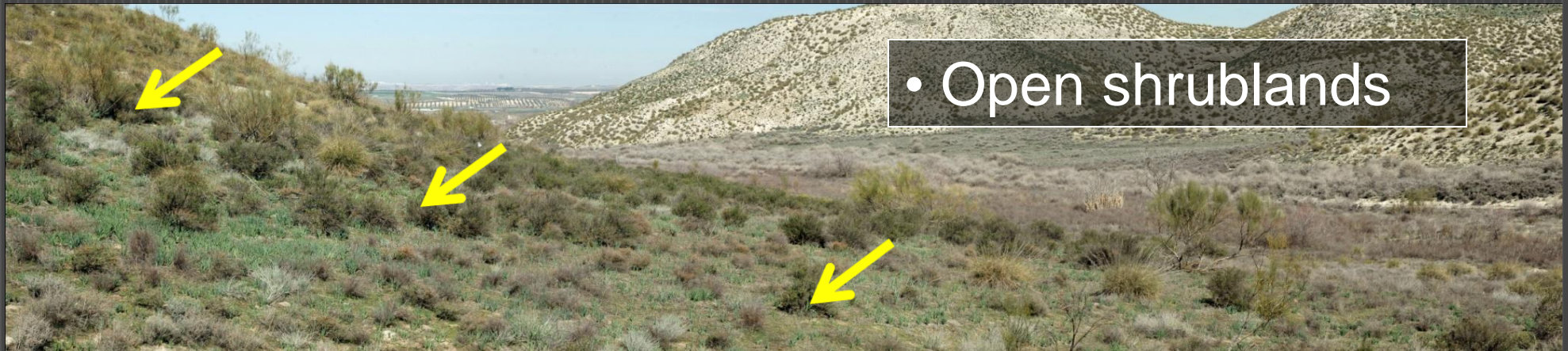


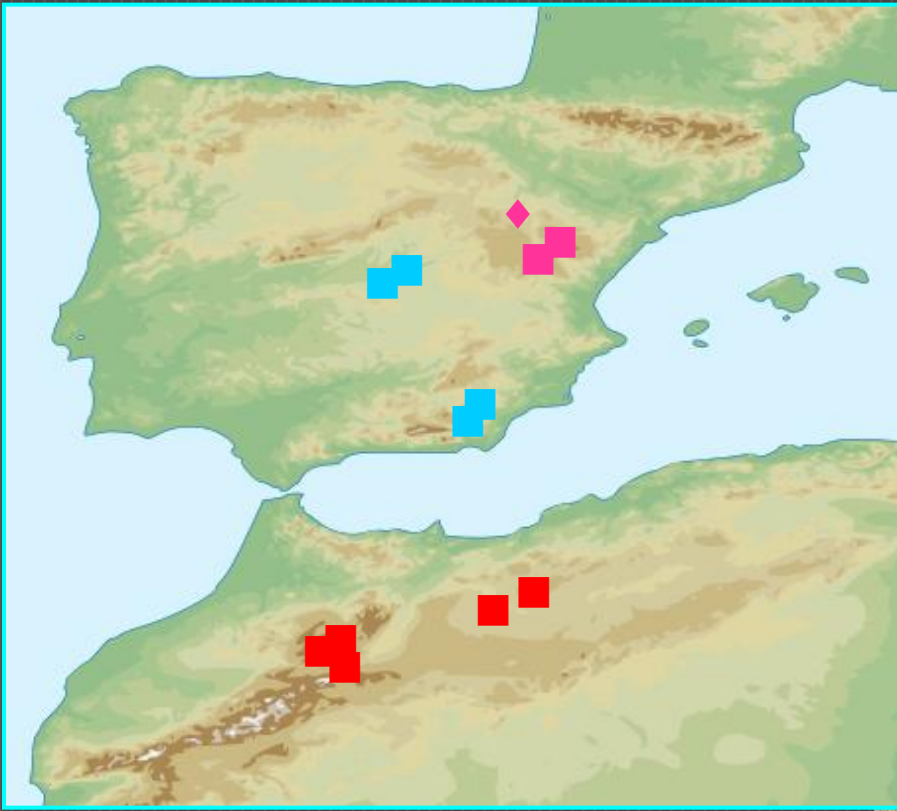
- Possible secondary myrmecochory
- Transient seed bank in the soil

Habitats



• Cliffs





Vella pseudocytisus L.

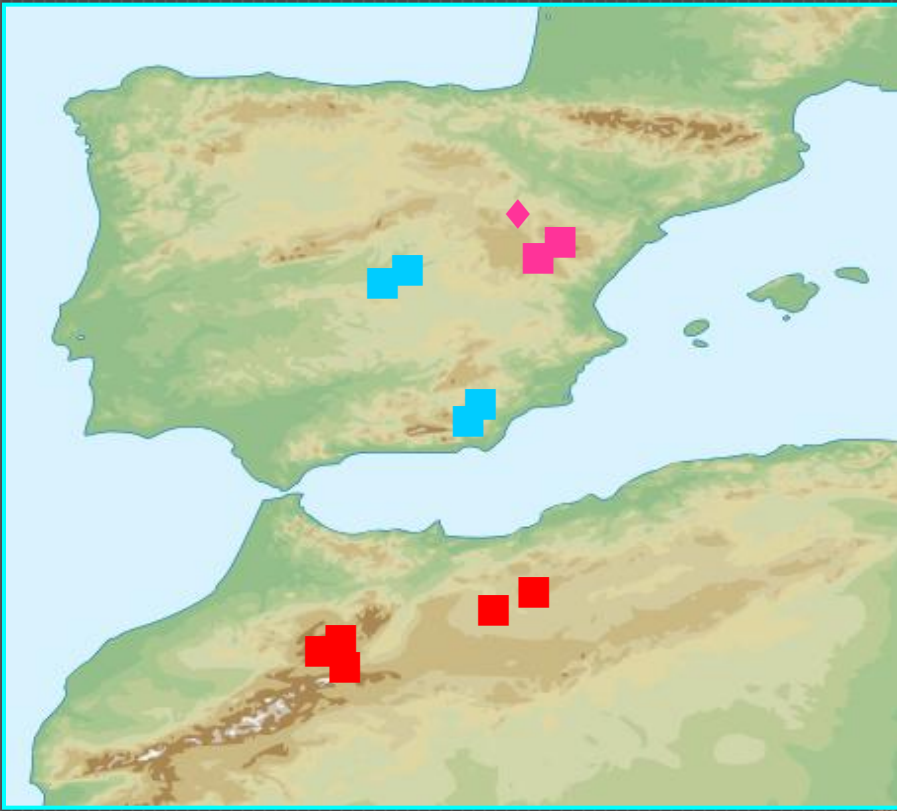
- subsp. *pseudocytisus*
- subsp. *paui* Gómez-Campo
- subsp. *glabrata* Greuter

- C & SE Spain
- EN (Moreno, 2008)
- Protected by regional laws
- Legal Recovery Plan in Castilla-La Mancha



Vella pseudocytisus L.

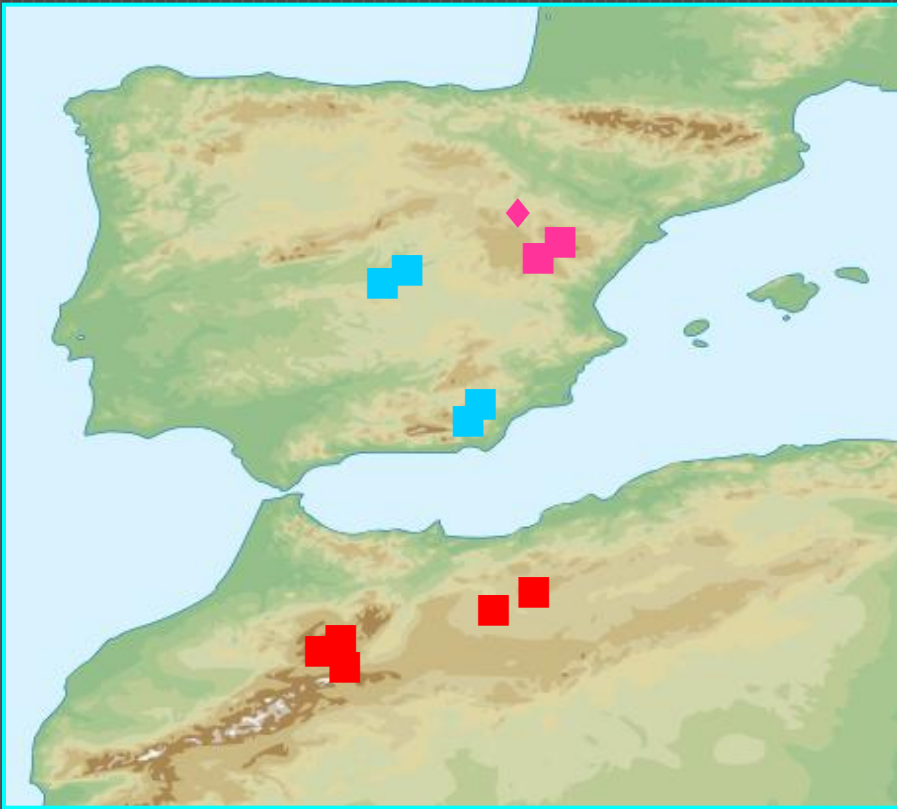
- subsp. *pseudocytisus*
- subsp. *pau* Gómez-Campo
- subsp. *glabrata* Greuter



- CE Spain
 - EN (Moreno, 2008)
- Protected by regional law
- Recovery Plan in Aragon
 - Ongoing reintroduction

Vella pseudocytisus L.

- subsp. *pseudocytisus*
- subsp. *pau* Gómez-Campo
- subsp. *glabrata* Greuter



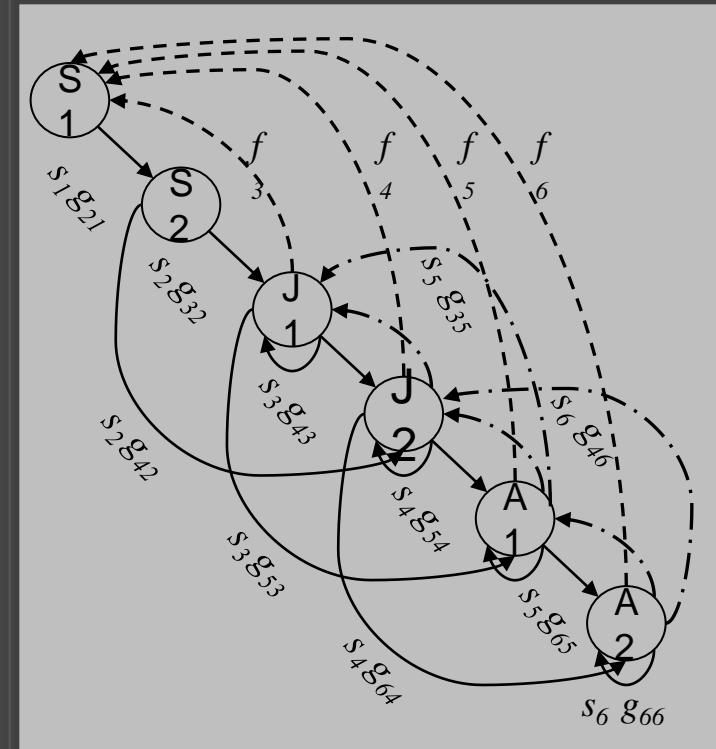
- Morocco: Middle Atlas
- Status: Rare (Fennane & Ibn Tattou, 1998)
 - No protection
- Algeria: no recent data

Demographic monitoring

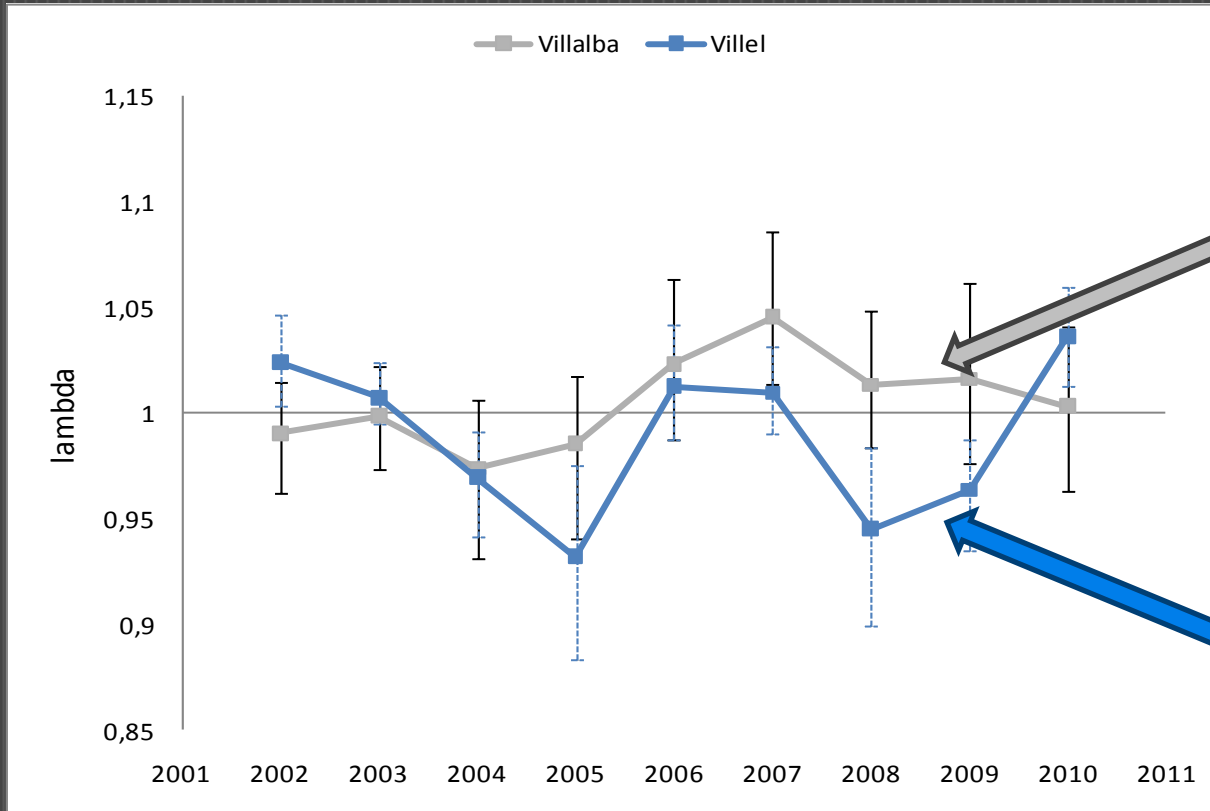
- Two plots in Aragon and two plots in Madrid (300 initial individuals in each plot)
- 2000-2011



Classes	
S1	1 st year seedling
S2	2 nd year seedling
J1	> 10 cm high / < 10 dm ³
J2	11 – 50 dm ³
A1	51 – 500 dm ³
A2	> 500 dm ³



Evolution of λ in Aragonian plots



Villalba: primary habitat

Villel: secondary habitat

Elasticity matrices: mean values 2000-2010

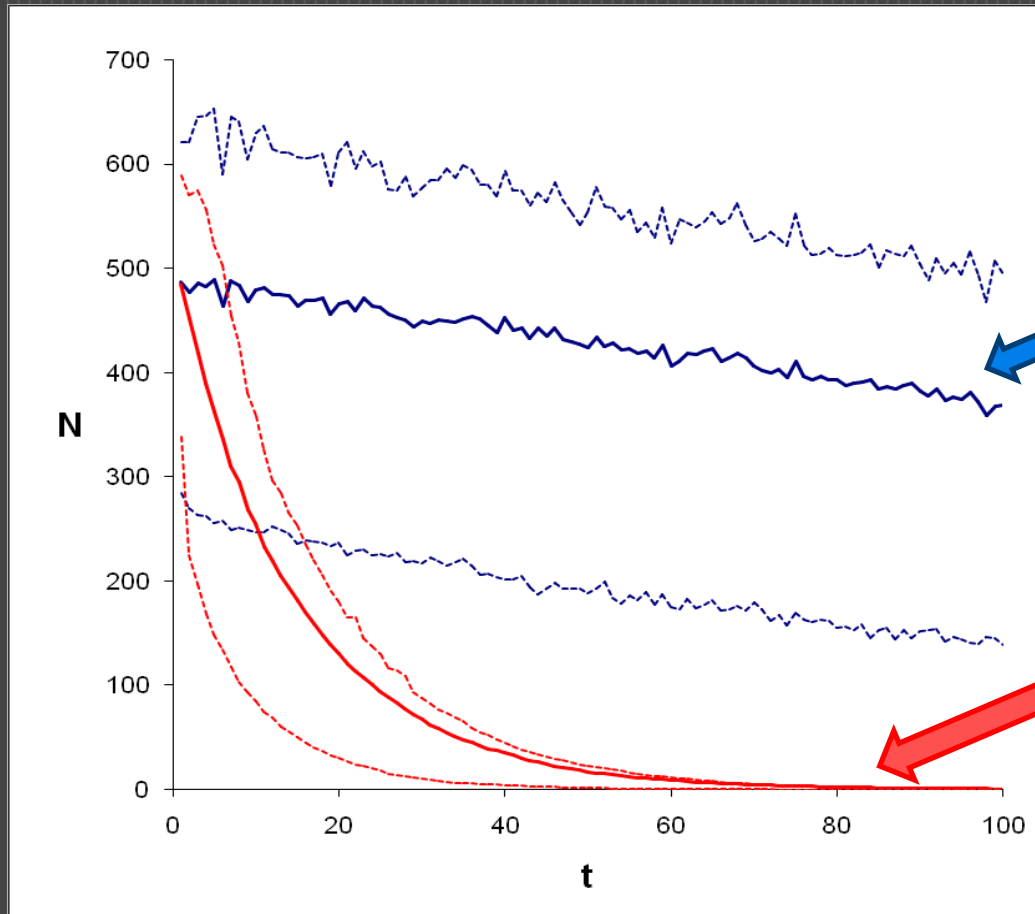
-	-	0,000202	0,000517	0,007027	0,015307
0,023052	-	-	-	-	-
-	0,018443	0,162365	0,016584	0,001438	-
-	0,004609	0,032923	0,133612	0,025134	-
-	-	0,003341	0,045173	0,286219	0,019863
-	-	-	0,000391	0,034779	0,16902

Villalba:
primary
habitat

-	-	0,000177	0,00013	0,004687	0,009237
0,014232	-	-	-	-	-
-	0,013508	0,187528	0,015634	0,002013	-
-	0,000499	0,023531	0,128406	0,024495	0,000522
-	0,000225	0,007447	0,033283	0,286171	0,013432
-	-	-	-	0,023191	0,211651

Villel:
secondary
habitat

Population projection for 100 years



Primary habitat

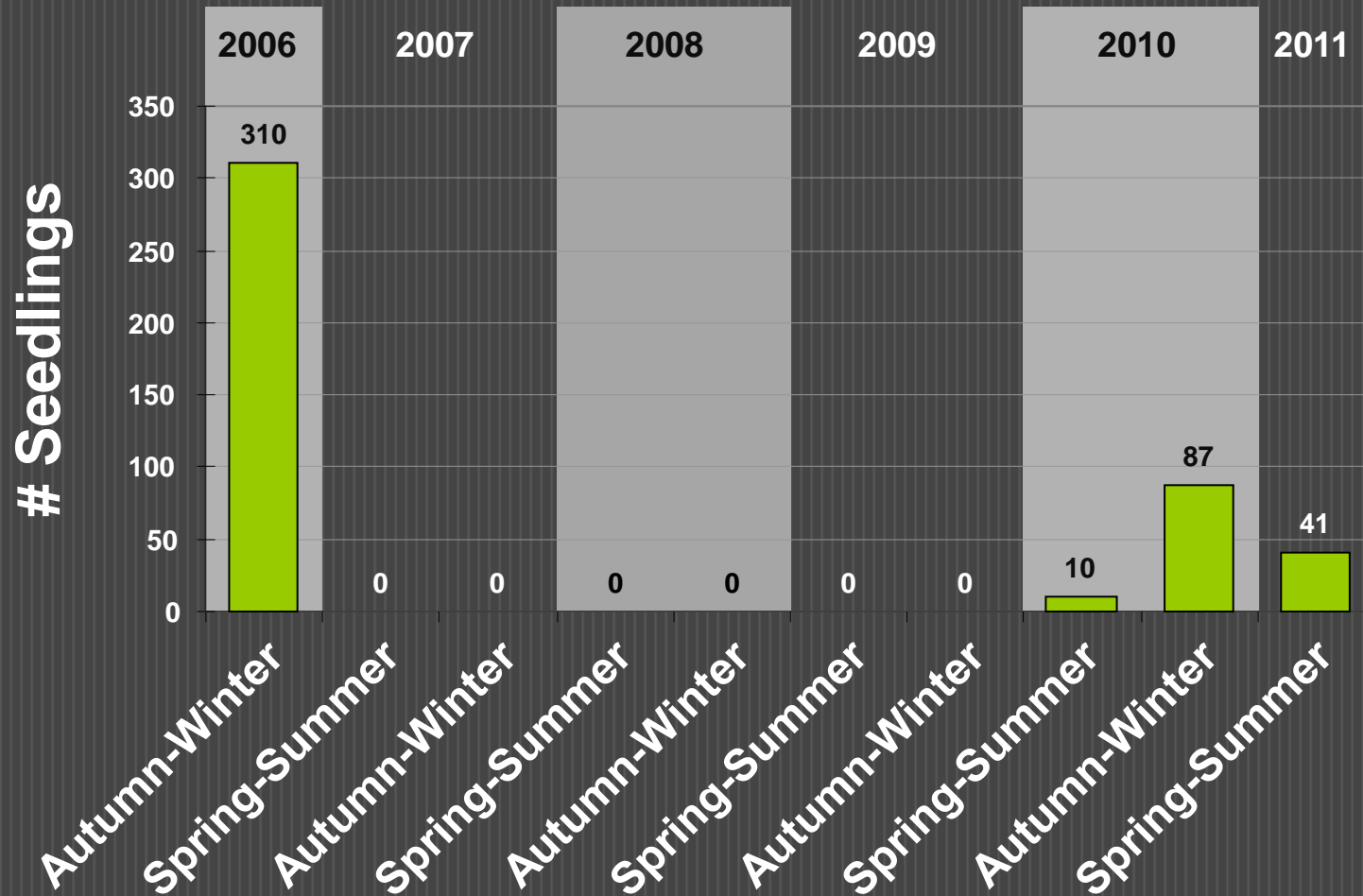
Secondary habitat

Seedling dynamic

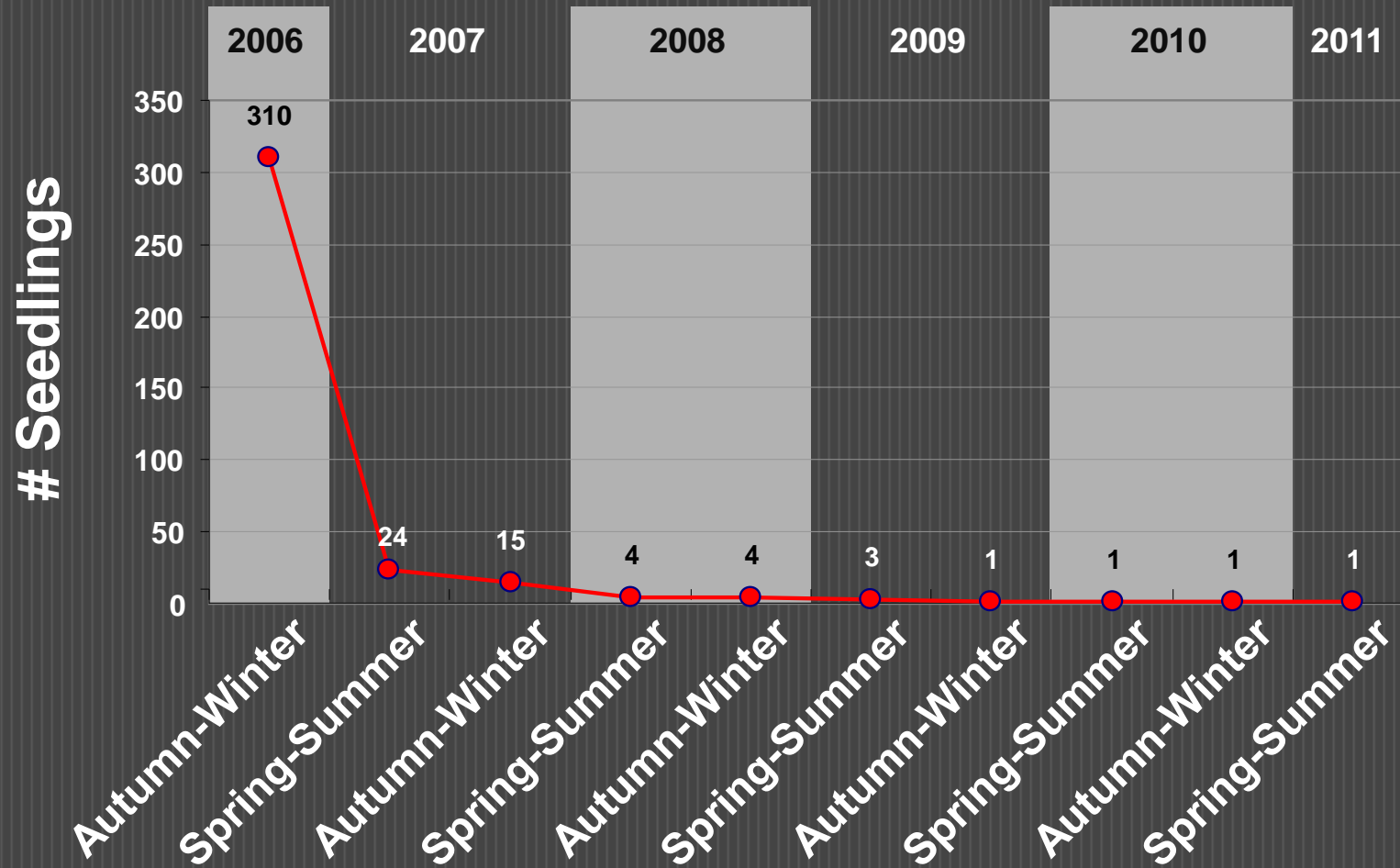
- Ten plots (5 x 1 m) monitored every 3 months



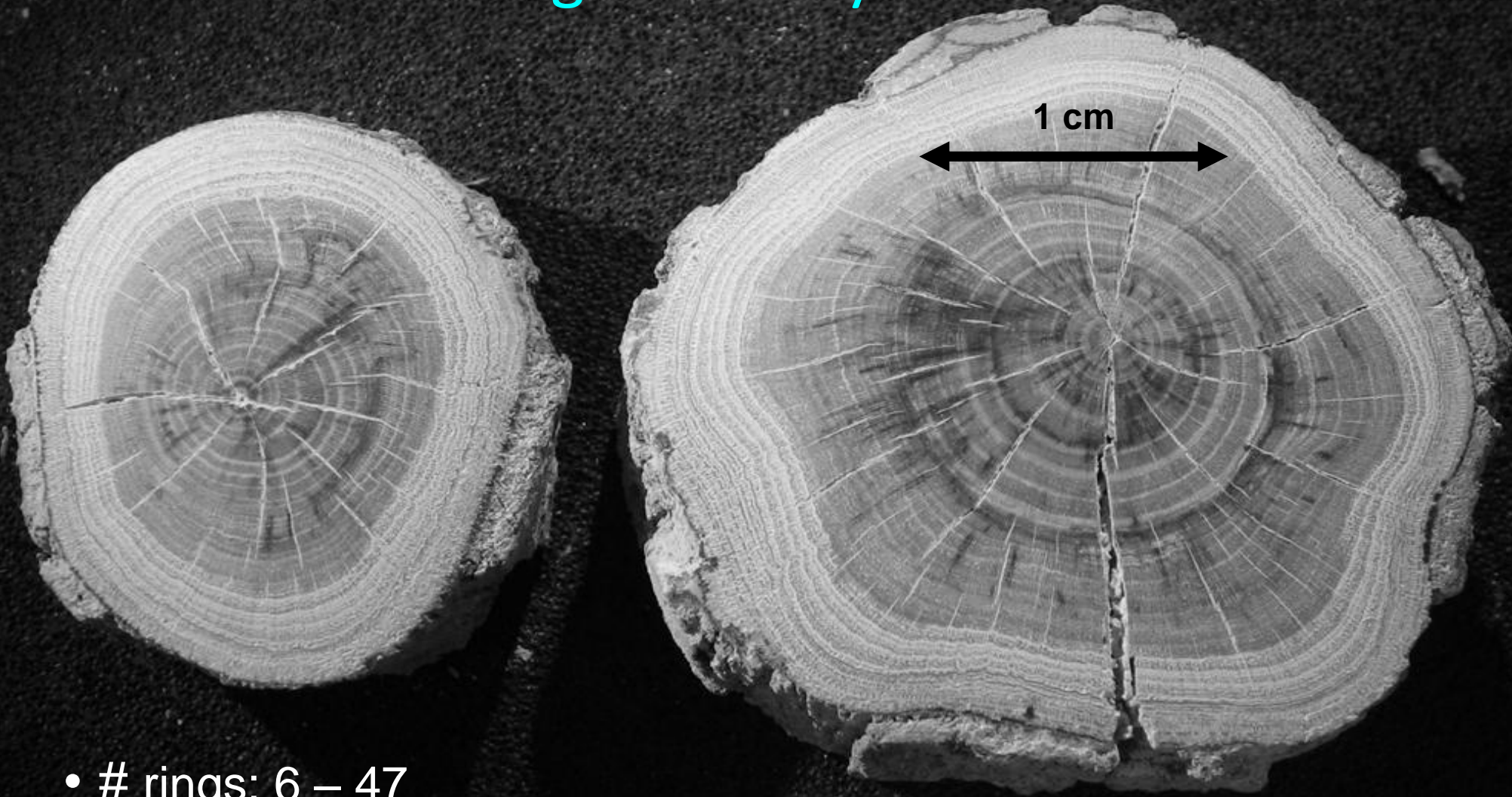
Seedling emergence



Seedling survival of the 2006 cohort



Dendrochronological study of 61 individuals



- # rings: 6 – 47
- Significant differences in longevity between populations

Changes in land use

Fenced plot in 2008



Provisional results:

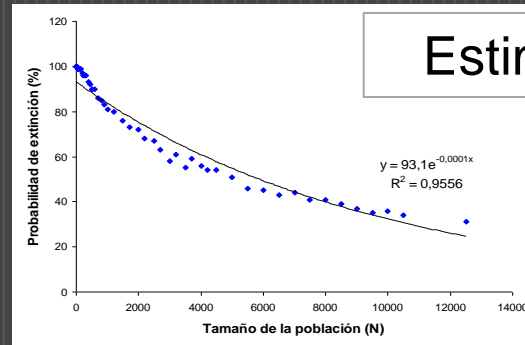
- Quick increase of fecundity
- Changes in growth or survival are not very noticeable yet

M.L. Jiménez Sánchez (2004)

Euzomodendron bourgeanum Coss.



-	-	0,0021	0,0241	0,0049
0,0301	0,0473	0,003	-	-
0,0009	0,0331	0,1637	0,0067	-
-	-	0,0356	0,5944	0,0051
-	-	-	0,01	0,0391



Estimated extinction curve in 50 years



J.M. Iriondo *et al.* (2009) Populations in peril: demographic viability of threatened Spanish vascular flora

- 37 taxa monitored between 2001 and 2006

Astragalus tremolsianus Pau



Sierra de Gádor				
	Clase 1	Clase 2	Clase 3	Clase 4
Clase 1	0,000	0,000	0,015	0,020
Clase 2	0,014	0,147	0,018	0,003
Clase 3	0,021	0,029	0,194	0,067
Clase 4	0,000	0,006	0,083	0,384

IUCN Criteria		10 years	20 years	100 years
A	Projected reduction	0%	-	-
E	Probability of extinction	0%	9%	100%



J.M. Iriondo *et al.* (2009) Populations in peril: demographic viability of threatened Spanish vascular flora

- 37 taxa monitored between 2001 and 2006

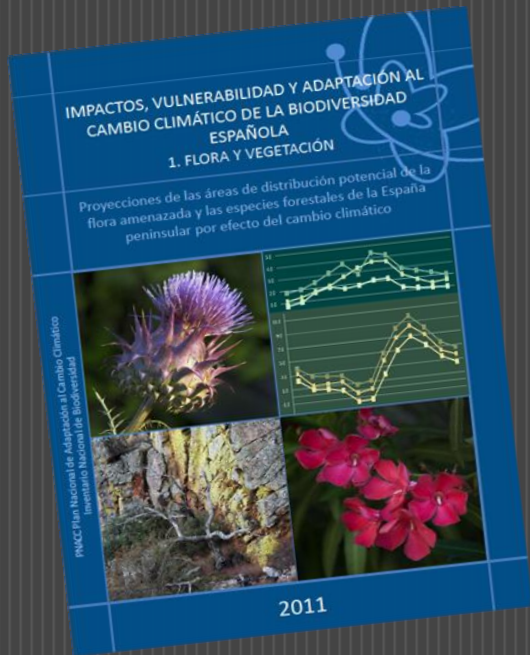
Helianthemum polygonoides Peinado *et al.*



Cordovilla				
	Clase 1	Clase 2	Clase 3	Clase 4
Clase 1	0,155	0,000	0,011	0,041
Clase 2	0,051	0,070	0,003	0,014
Clase 3	0,000	0,052	0,193	0,019
Clase 4	0,000	0,017	0,057	0,318

IUCN Criteria		10 years	20 years	100 years
A	Projected reduction	0%	-	-
E	Probability of extinction	0%	0%	96%

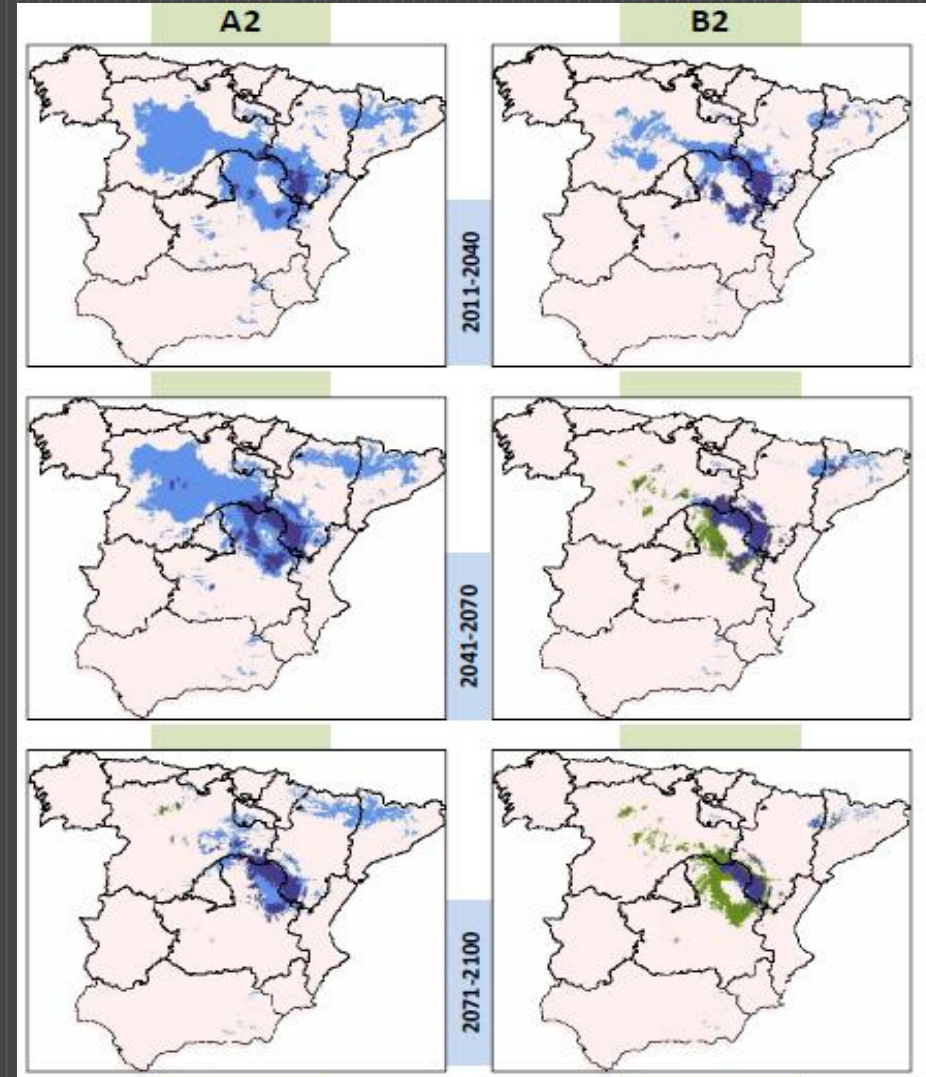
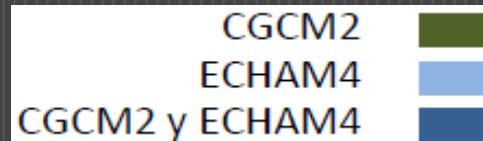
Projected areas of potential distribution of the threatened Spanish flora



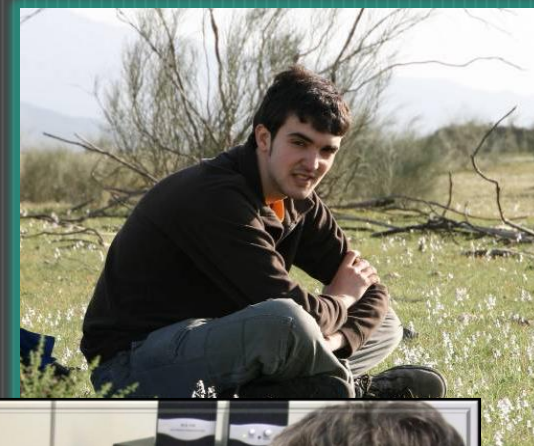
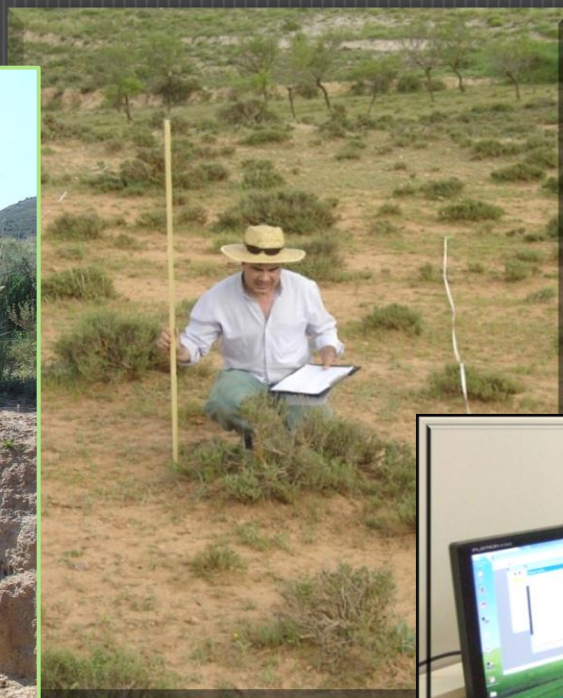
A.M. Felicísimo
et al. (2011)

“... not foresee future problems (for *Vella pseudocytisus* subsp. *pau*) due to climate, with large potential areas superimposed on the currently occupied.”

Climate models

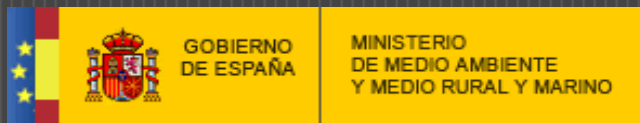


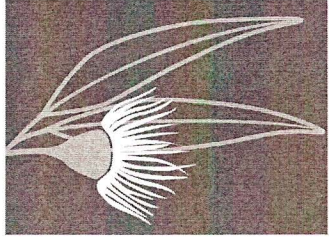
Thank you for your attention!



Acknowledgements:

J. Mota, A. González, R. López, J. Sánchez, A. Baltanás





IBC2011

XVIII international botanical congress

MELBOURNE AUSTRALIA | 23-30 JULY 2011

Certificate of Presentation

This to certify that

Juan Carlos Moreno Saiz

Gave an oral presentation on 29th July 2011

at the XVIII International Botanical Congress held in Melbourne (Australia) 23-30 July 2011

The presentation was titled

Conservation challenges on Mediterranean gypsophytes

as part of the Theme 01

Ecology, Environmental Change & Conservation

in SYM167

Plant Conservation - Population biology

Ashleigh Ockerby
Event Coordinator
ICMS Australasia Pty Ltd