

**Open2preserve Regional Workshop- PT Norte**  
**Dimensão ambiental**



upna

Universidad Pública de Navarra  
Nafarroako Unibertsitate Publikoa

Extensive grazing for  
biodiversity: a necessary  
land management tool

**Rosa Maria Canals**

**Interreg**   
**Sudoe**  
**OPEN2PRESERVE**  
European Regional Development Fund



## The ecological background

- Herbivory in the inherited natural landscape
- The meaning of the decline of current grazers
- Richness and diversity are important for ecosystems
- The role of grazers on species richness and diversity
- Conclusions



## How the historical, natural landscape looked like..

Before the arrival of hominids, Europe was a **mosaic of forests and open grasslands** (Vera, 2002).

Two vegetation-consuming disturbances, **fire and herbivory**, had a crucial role creating and maintaining the mosaic.



Subsequent human activity, emulating the natural disturbances, promoted and increased this mosaic

**Nowadays, they are more than 221 species of herbivores in all type of environments  
Many extinguished before...**





**Grass and roughage eaters**



**Intermediate types**

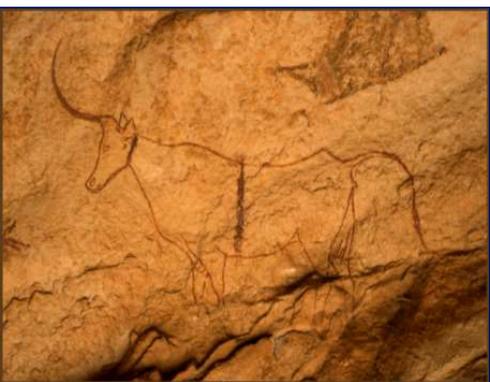
**Ruminant feeding types  
(Hoffmann, 1988)**

**Concentrate selectors**



## Grass and roughage eaters: The focus of the domestication in the Neolithic

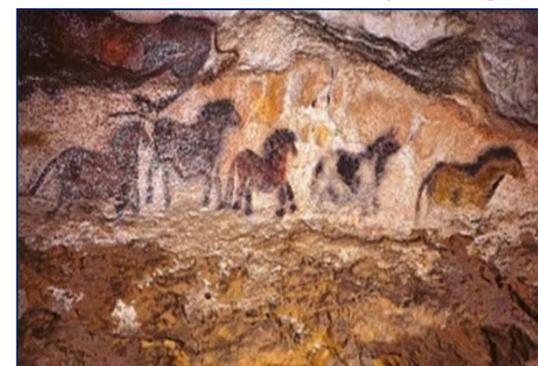
Uro (extinguished)



European mouflon



Tarpán (extinguished)

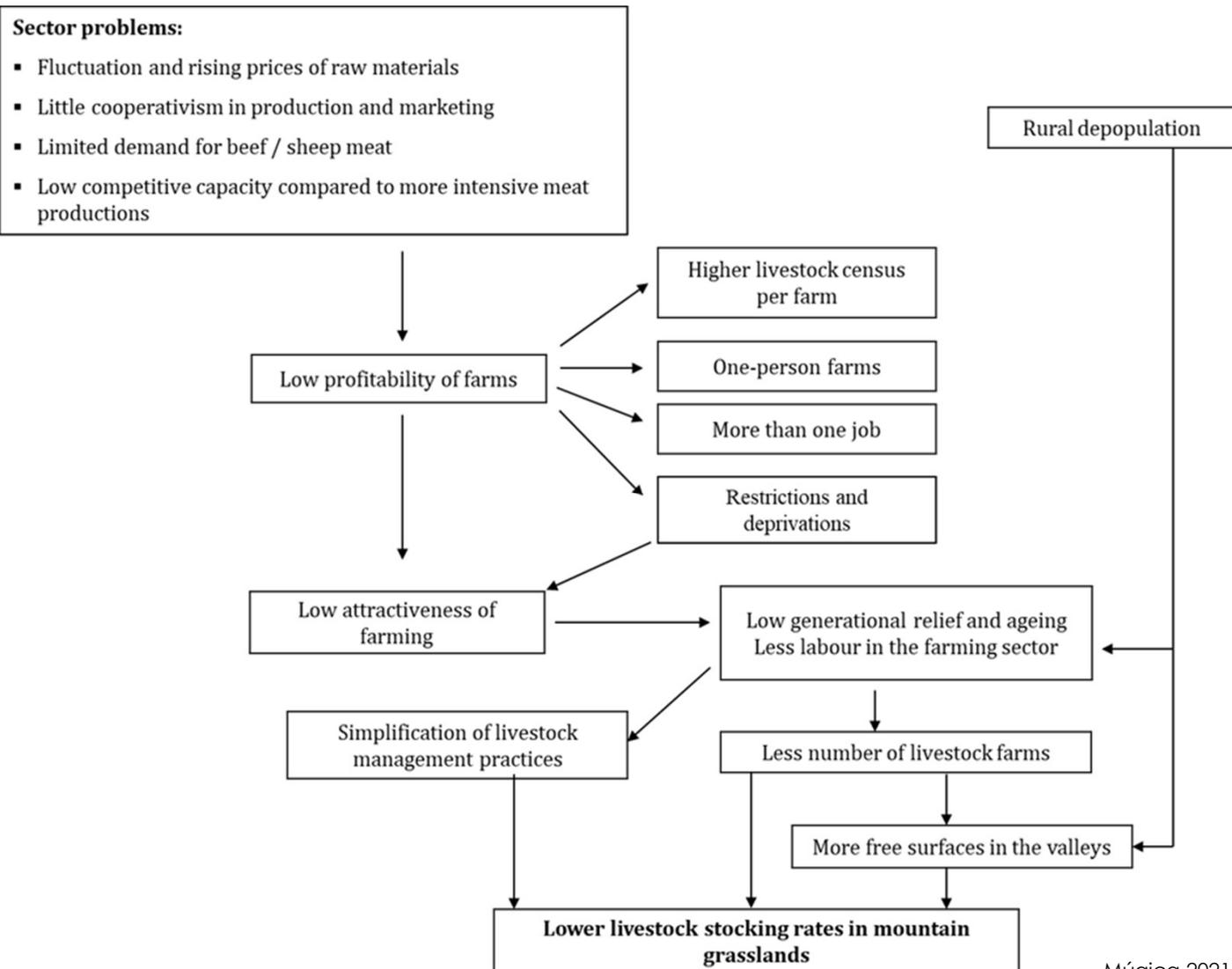




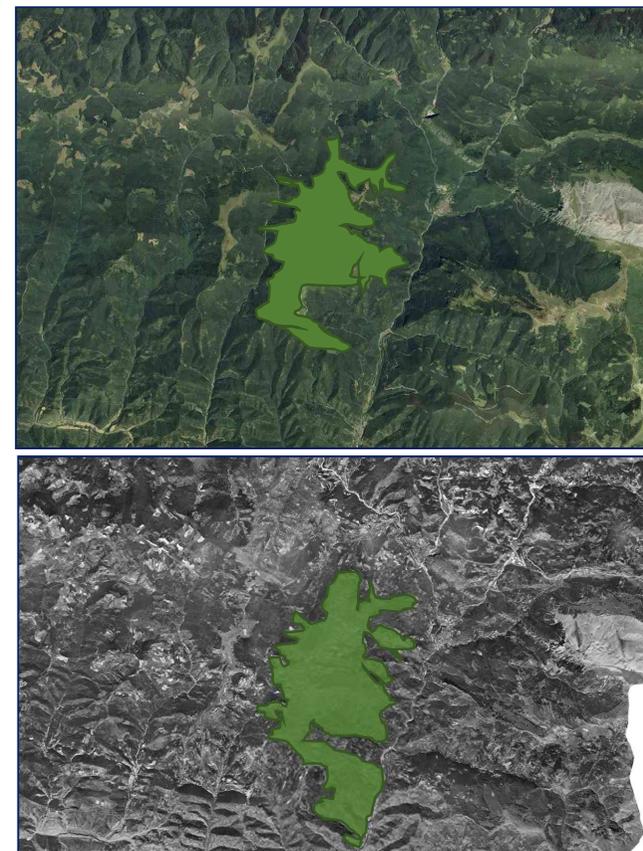
**Extensive ranging** came to occupy the **ecological niche** left by wild herds of herbivores  
**For millennia**, domestic grazers have provided the ecosystem services associated to herbivorism

.....**fill today**

# Decline of grazing caused by socioeconomic changes. The Pyrennees as example



2010 & 1956 flights  
 Santa Bárbara commons (Western Pyrennees)

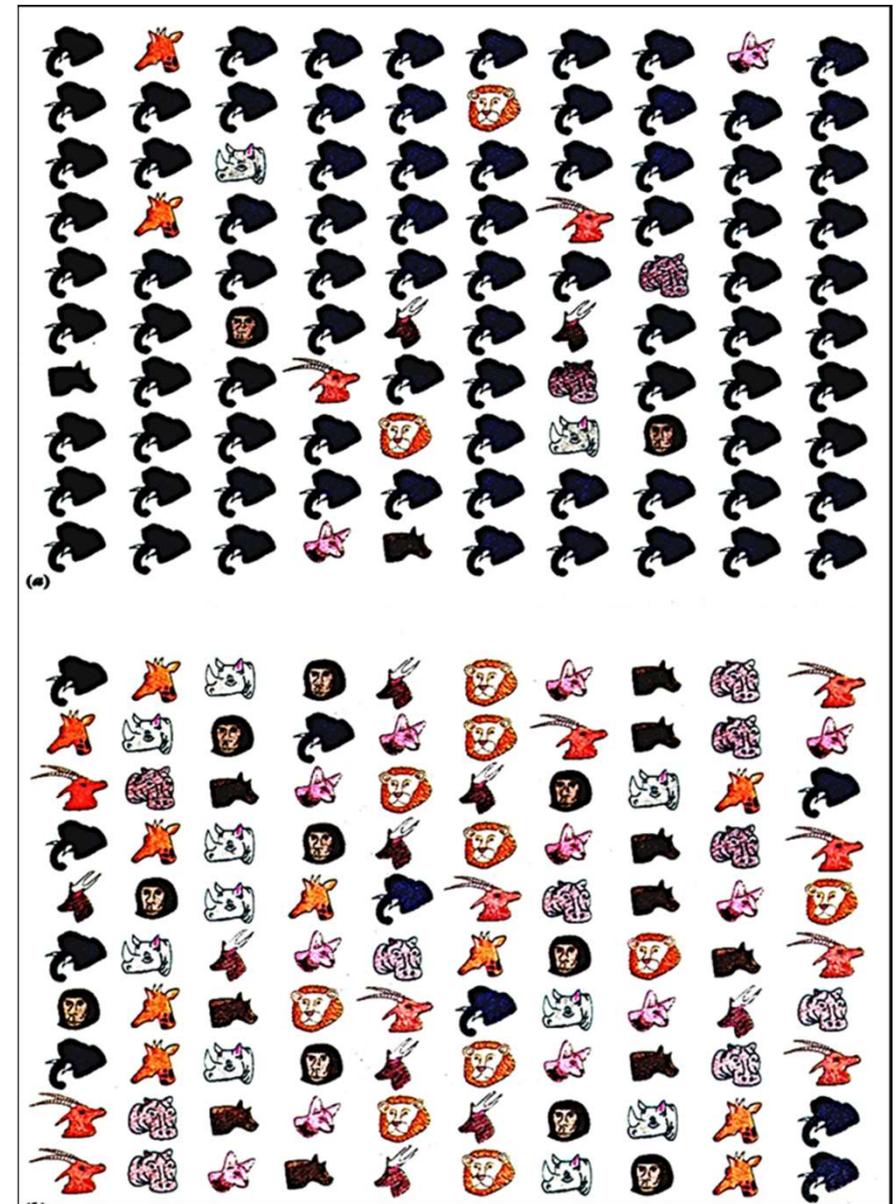


Múgica 2021, modified from Razquin et al. (2012)

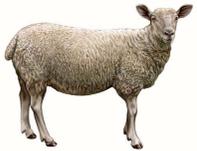
## The diversity concept and its importance

Species richness and diversity of species are crucial for assessing the quality and conservation status of an habitat because they inform about:

- The capacity of the habitat to support a diversity of living beings and their complex interactions.
- The functionality of the habitat (redundancy of functions).
- The habitat's potential for resistance and resilience to changing conditions (such as the CC).



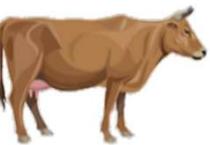
Herbivores have a crucial role on species richness and on the different scales of the diversity



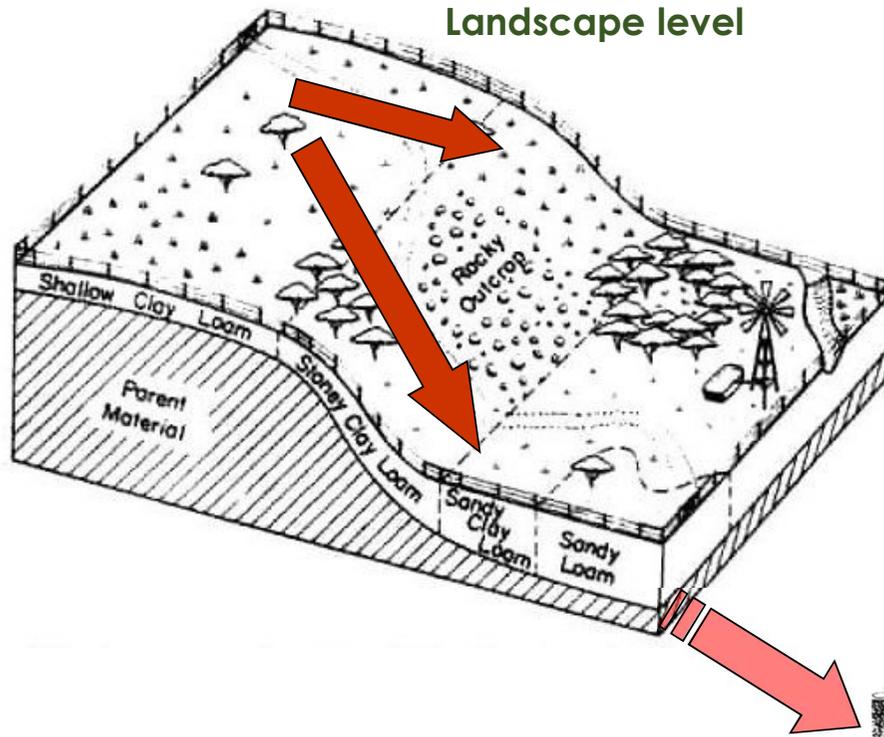
Local diversity:  $\alpha$  diversity



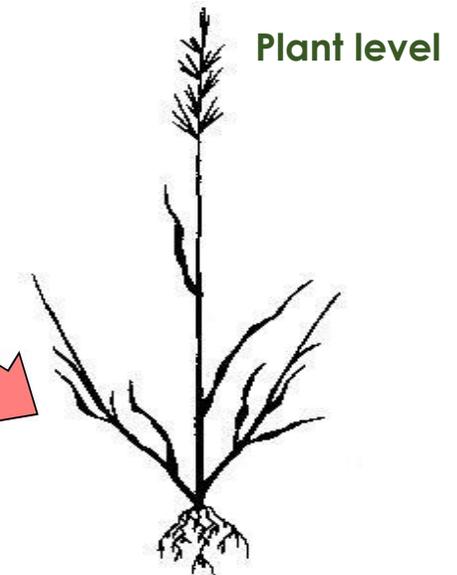
Landscape diversity:  $\gamma$  diversity



## Because they move and interact with the different scales of the landscape



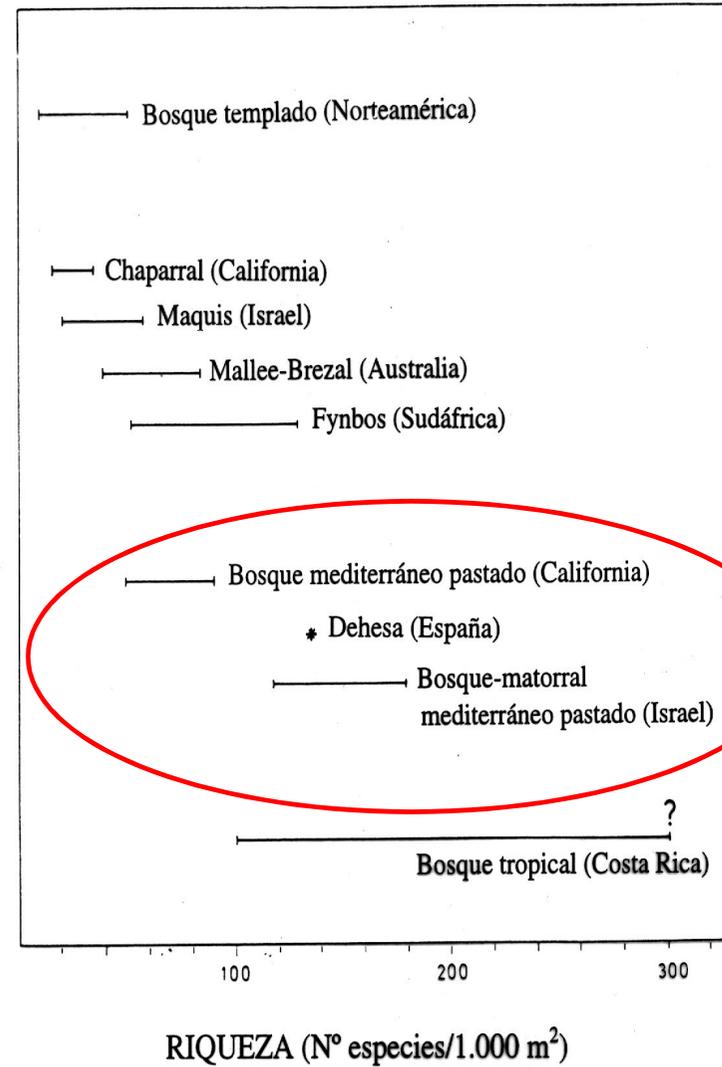
Providing environmental heterogeneity  
Decreasing most competitive species and enhancing plant coexistence  
Fertilizing frequented areas with organic nutrients .....



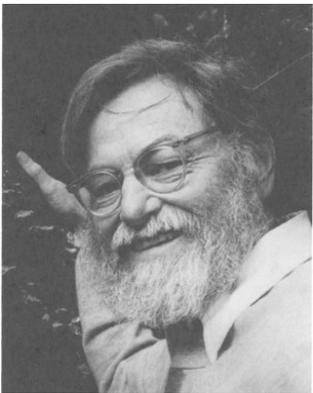
**Grazing management:** a consensus among animal needs and farmers interests

# Stepping on topics!

Undisturbed, not managed areas are richer than areas altered by grazing



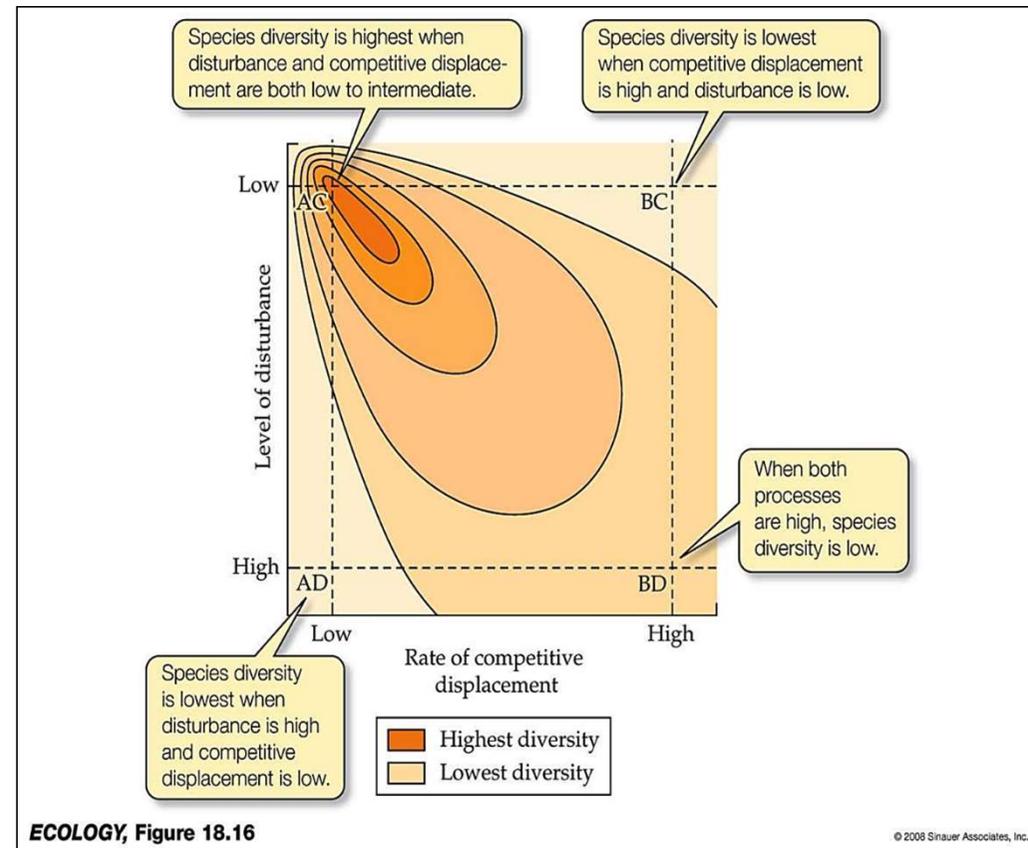
Valores de diversidad (número de especies en 1.000 m²) para diversas comunidades vegetales:

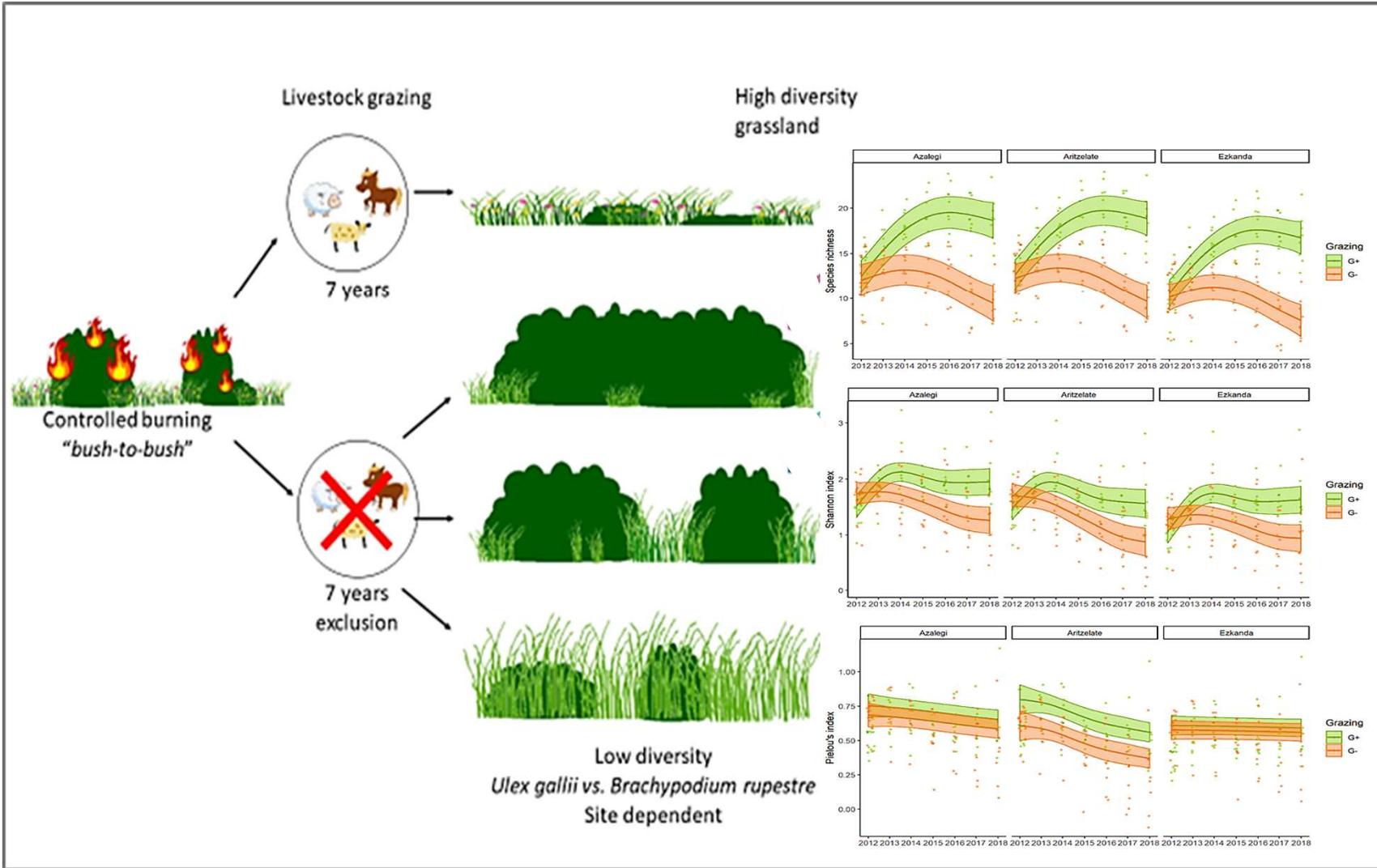


## Disturbance and diversity

### INTERMEDIATE DISTURBANCE HYPOTHESIS Connell, 1978

The greatest diversity occurs under intermediate conditions of disturbance. If the natural disturbance regime **disappears or intensifies**, the adaptive balances that constituted the ecosystem disappear. The ecosystem responds by losing species richness and diversity.





Múgica et al. 2021

Plant diversity: Hart 2001, Sebastià et al, 2008,....

Birds diversity: Baldi et al 2005, Kerekes et al 2016,....

## Messages to take home....

Natural landscapes evolved under a regime of herbivory.

Grass-eaters herbivores were mostly replaced by domestic grazers during the Neolithic.

Extensive ranging is now strongly reduced. The lack of grazers involves a loss of grasslands and a loss of diversity.

Extensive grazing is a necessary land management tool to maintain diverse and healthy ecosystems.

The environmental role of grazers in the current scenario of change is crucial. It has never been as important as today.

