



**2nd Mediterranean Plant Conservation Week**  
 "Conservation of Mediterranean Plant Diversity: Complementary Approaches and New Perspectives"  
 Main organizers: CARE-MEDIFLORA project & IUCN-MED  
 12-16 November 2018, La Valetta, MALTA

# OVERGRAZING BY UNGULATES

## AFFECTS *EUPHORBIA DENDROIDES* L. POPULATION STABILITY

### IN MALLORCA LANDSCAPE (BALEARIC ISLANDS)

Supported by:




G CONSELLERIA  
 O MEDI AMBIENT,  
 I AGRICULTURA  
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 BALEAR NATURA



- Miquel Capó**
- Chiara Engelbrecht**
- Marta Ramoneda**
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- Juan Rita**
- Elena Baraza**

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**HERBINSU**  
 CGL2015-70449-R



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# Muere un ciclista en Mallorca tras esquivar una cabra y caer por un barranco

Miquel Pol, de 29 años, circulaba por la Sierra de la Tramuntana cuando se les cruzó el animal

Mayka Santana / Antoni Oliva | 19.06.2018 | 12:38

Miquel Pol, un ciclista de 29 años falleció ayer tras precipitarse por un **barranco de unos 15 metros de altura** en la carretera de Lluç, en Escorca, según informaron fuentes del SAMU 061. Al parecer, el joven, perteneciente al Club Ciclista Mancor, circulaba con un grupo de compañeros por la Sierra de la Tramuntana cuando se les cruzó una cabra por la carretera, lo que provocó que el varón cayera por el terraplén al tratar de esquivarla. Apenas habían pasado 24 horas de su última competición: la XXXIV edición del Pla Mallorca.



Miquel Pol. DM

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tus razones también.

descubre más razones aquí

Citizens

Forestry Engineers

Ecologists



Goats allowed

Goats excluded

# ▸ Feral goats overpopulation effects



*Euphorbia dendroides* L.

# La Victoria population case

▸ *E. dendroides* population recently disappeared

YEAR 2005

YEAR 2010



Fotografía de Ll.  
Llorens

▀ *E. dendroides* population recently disappeared

YEAR 2015

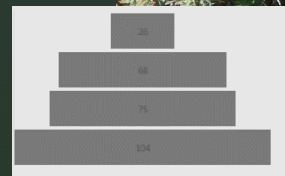


Is goats overpopulation the main cause of this disappearance?

### PREDATION MONITORING



### DEMOGRAPHIC ANALYSIS



## La Victoria population





## Mortitx population

### PUBLIC AREA

Goats population control

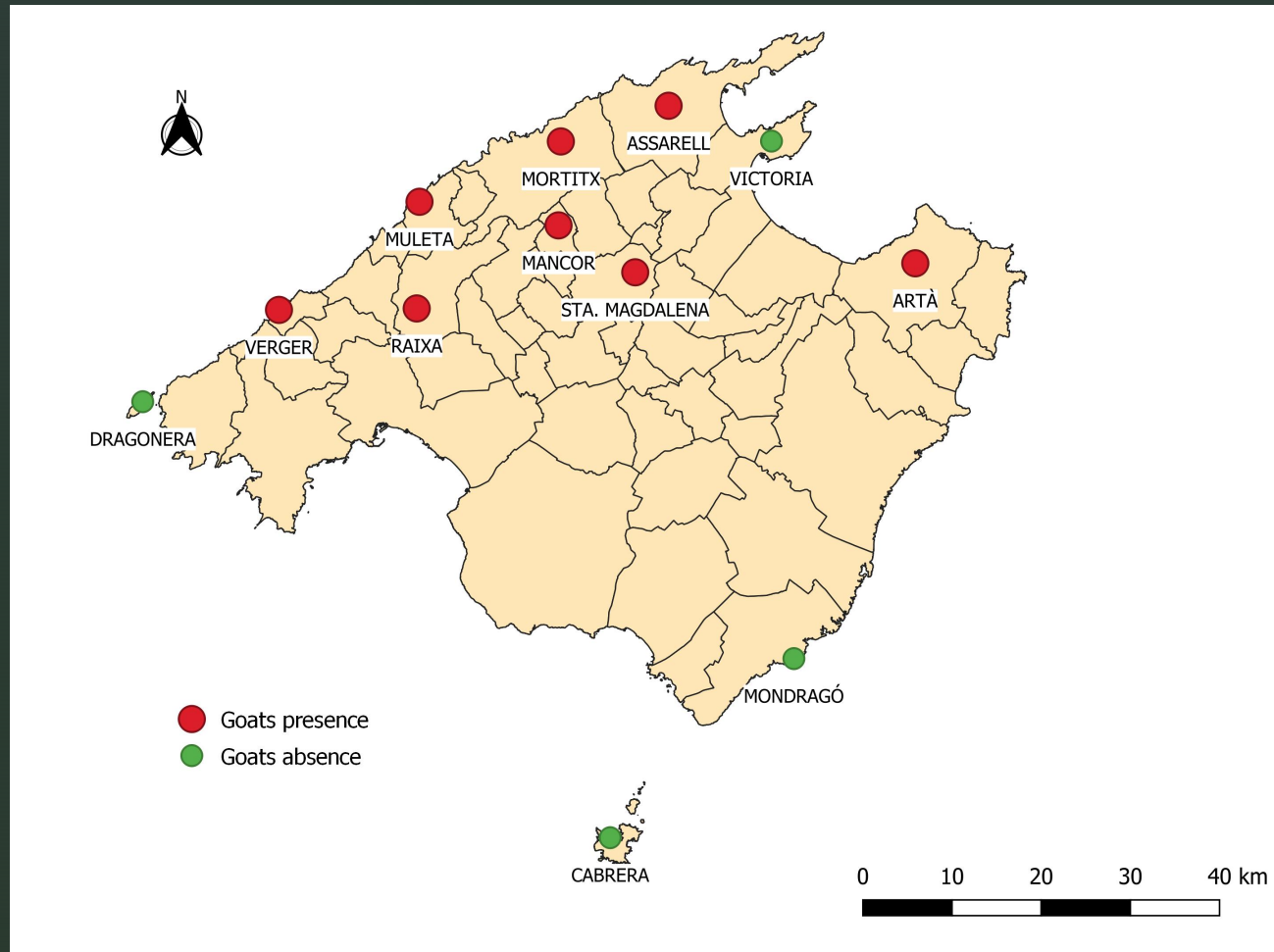
Few individuals of *E. dendroides*

Natural individuals observed were predated



**Population control can benefit its restoration?**

# Demographic analysis



## Parameters analysed

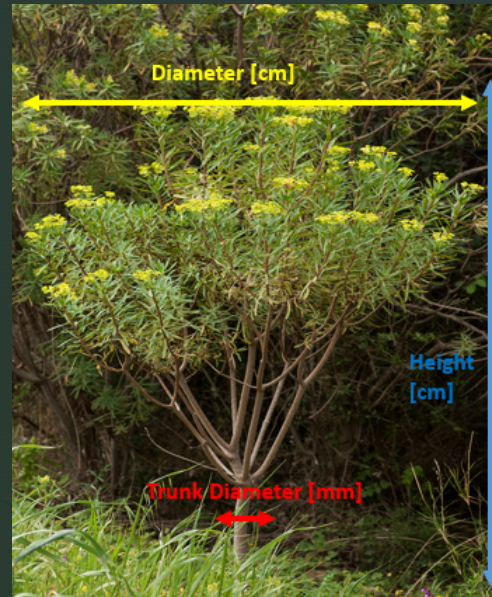
In each population:

Three plots (10 x 10 m)

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### Life stages:

- Seedlings
- Juveniles
- Young adults
- Old adults



### Plant features:

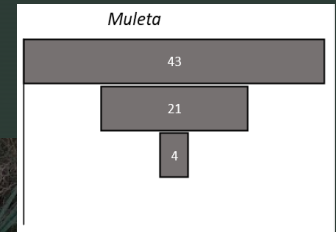
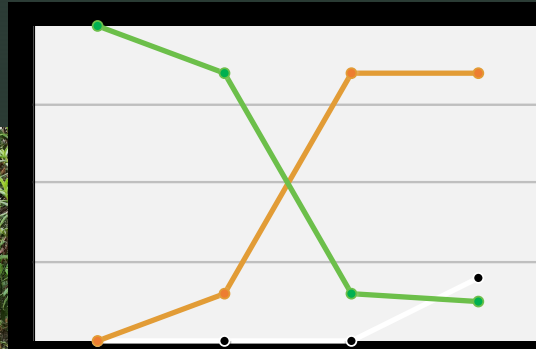
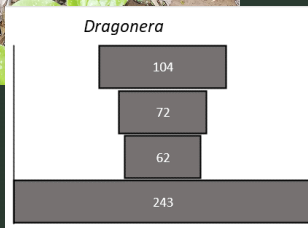
- Height (cm)
- Plant diameter (cm)
- Trunk diameter (mm)
- Flowering percentage (%)

### Size index

0<8 Seedling  
8<40 Juvenile  
40<120 Young adult  
>120 Adult

De Cáceres *et al.* (2013)

# RESULTS

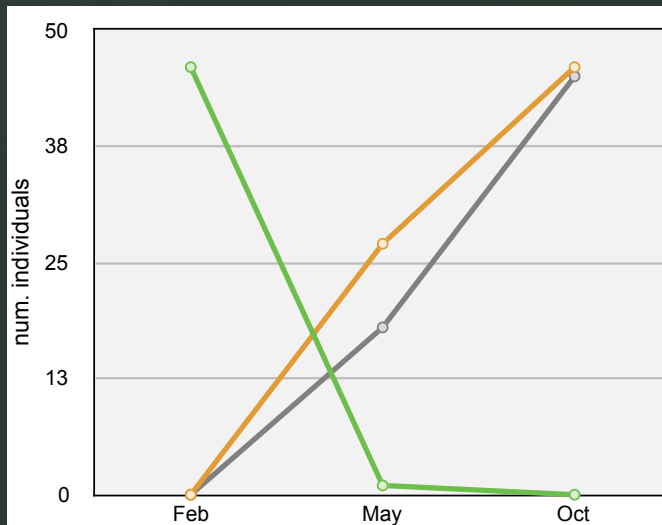


# La Victoria

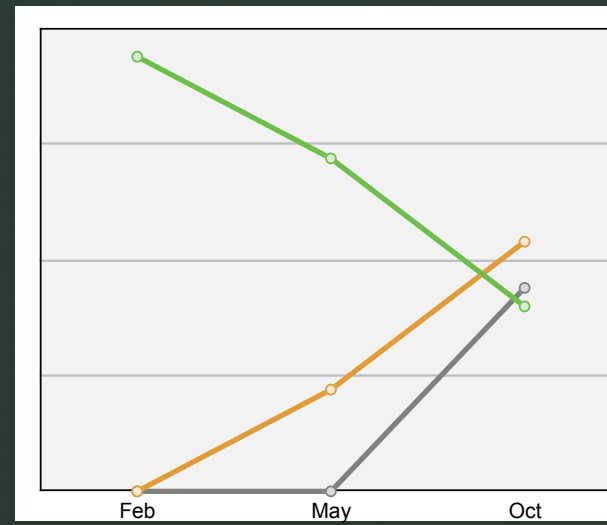
Population collapse during spring

All exposed individuals died after summer

Exposed



Protected



● Not affected ● Eaten ● Dead

100% exposed plants **died**

±50% protected plants showed **no affection**

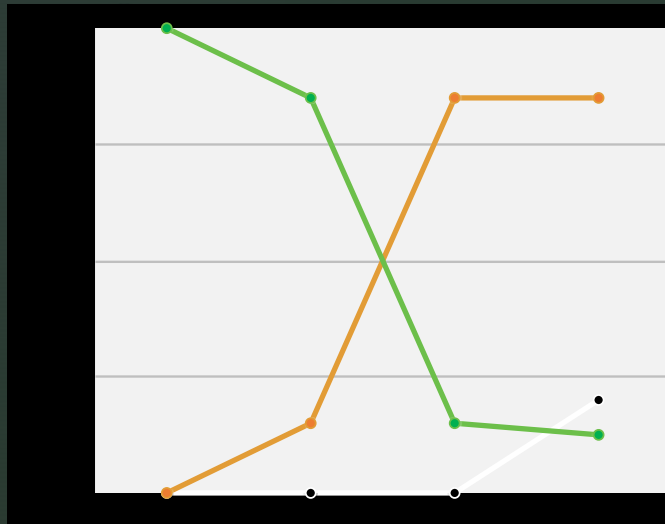
High death events caused by **dry during summer**

# Mortitx

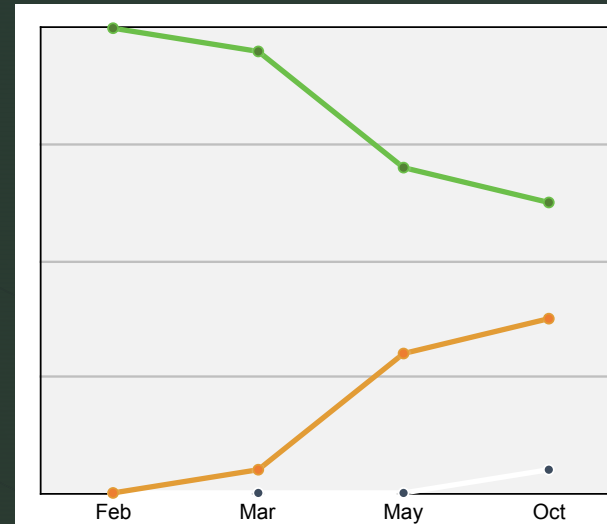
Less predation impact

Less death events in summer

Exposed



Protected



● Not affected ● Eaten ● Dead

Exposed plants were **more predated**

Protected plants showed predation only in **the outside branches**

**Less death** proportion than La Victoria (Good climatic conditions)

## Herbivory symptoms in plants

The majority of exposed plants re-shot in Mortitx

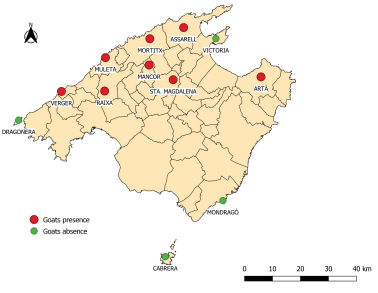
Exposed



Protected



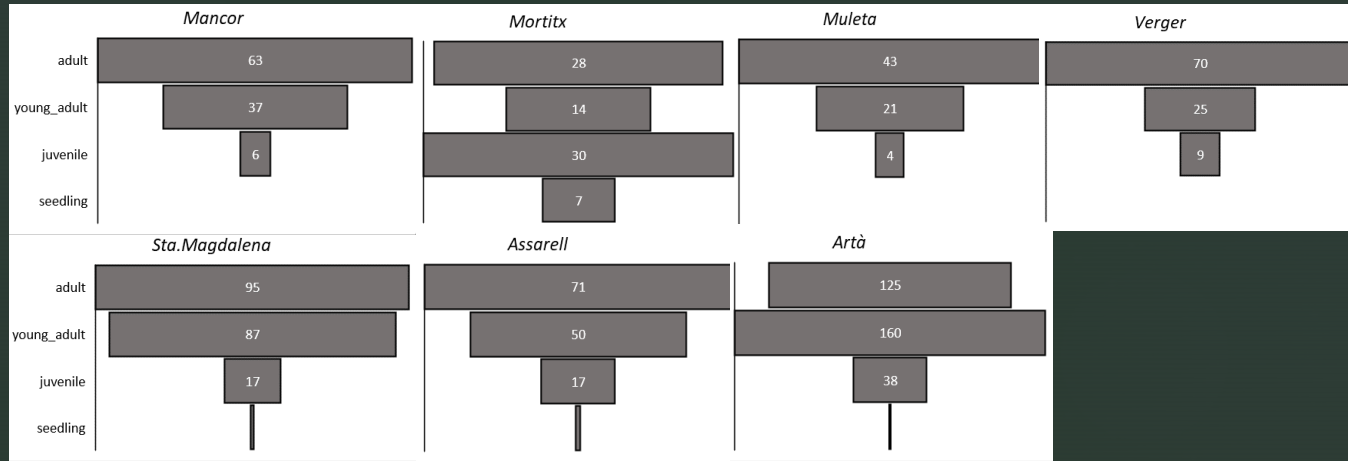
Protected plants  
only outside branches  
were eaten



# Demographic status

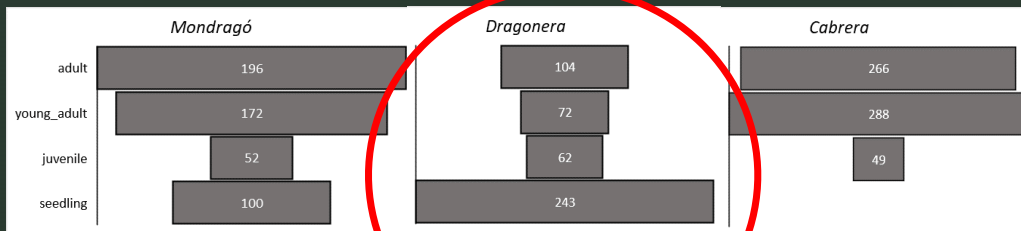
Populations with goats showed less absolute number of individuals

Goats present



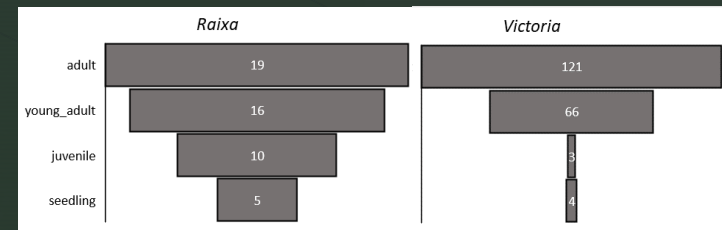
Similar structure

Goats absent



Rats and rabbits absent

Recently fenced





## Total number of individuals and density

Location	Num individuals	Density (ind/m <sup>2</sup> )
Dragonera	410	1.37
Mondragó	409	1.17
Cabrera	292	0.97
Sta. Magdalena	128	0.42
La Victoria	129	0.42
Assarell	89	0.3
Artà	91	0.3
Verger	79	0.26
Mancor	71	0.24
Mortitx	65	0.22
Muleta	55	0.18
Raixa	38	0.13

Double

## Conclusions

- Despite **toxic compounds** goats can depredate *Euphorbia dendroides*.
- The exposed individuals were **predated** mostly in spring. Concretely, in La Victoria 100 % were dead by autumn.
- Populations of *E. dendroides* with and without herbivores differed in the **population density**. Goats also affect negatively the demographic structure.
- Although goats presence in the island is ancient. The individual density seemed to **overpass** the maximum loading capacity for the insular ecosystem.



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