

## **Abstract**

This Thesis addresses the role of a burrowing herbivore, the European rabbit (*Oryctolagus cuniculus*) as an ecosystem engineer. The main objective was to explore their non-trophic interactions, especially those derived from their burrowing activities and their effects on the soil seed bank. This investigation was carried out in a 300 ha dehesa in southwestern Madrid.

The study of rabbit engineering effects was approached at several scales. On the one hand, the density and distribution of rabbit warrens were explored considering the whole study area. GLZ models were used to identify the main factors that determine both warren size and density, and their distribution pattern was explored. The importance of certain microhabitat elements (e.g. woody vegetation and rocks) associated with warrens, which could be relevant in terms of protection or structural support, was also considered.

At an intermediate scale, the influence of rabbit burrows on the lizard community in the dehesa (abundance, density, diversity and body condition) was investigated in three different habitats (open pastures, holm oak patches and scrub patches), comparing patches with and without burrows in each case. The potential resources provided by warrens, such as food availability, refuge and a favourable microclimate, were also explored.

Rabbit effects on the herbaceous community of the dehesa were addressed by comparing the vegetation of certain elements within their home range (warren, warren influence area and latrines) with the vegetation inside herbivore exclusion plots. The internal heterogeneity in species composition of each rabbit element was also studied, and their contribution to beta diversity in dehesa pastures was quantified.

At a smaller scale, the effects of rabbits on the soil seed bank were investigated, taking into account the potential influence of productivity and the interaction with a larger herbivore, sheep. Additionally, the estimation of the contribution of rabbits to the soil seed bank through endozoochory was attempted. Pasture sites of different productivity (high and low) were considered. At each site, five blocks with three herbivory treatments were situated: 1) free herbivore grazing; 2) sheep exclusion, rabbit grazed; 3) sheep and rabbit exclusion. Inside each grazed plot 3 subplots were included, in which dung pellets were removed (subplots without dung), and another 3 which were left untouched (subplots with dung).

The results of this Thesis show that the main structure within the rabbit home range, the warren, can reach high densities and become an accessible resource at a wide scale. Warrens can provide several resources for the lizard community in the dehesa, increasing lizard abundance and diversity. Warren and latrine building are an important source of diversity and heterogeneity in herbaceous species composition, and they promote differences in vegetation height and cover. Rabbits create areas with a different floristic composition from surrounding pastures, increasing beta diversity. Additionally, rabbit presence in these pastures influences the species composition of the soil seed bank, and their dung contributes to the dispersal of certain species and floristic guilds.

The results obtained highlight the ability of rabbits to modulate the availability of resources, and show that they are capable of acting as ecosystem engineers in a Mediterranean dehesa environment.