

INTRODUCTION

The LIFE-ADAPTAMED project is focused on adaptive management of Mediterranean forests and its resilience to global change. This project has as main goal to alleviate the negative effects of Climate Change in the Ecosystem Services of three protected areas of the Iberian Peninsula: Doñana, Sierra Nevada and Cabo de Gata.

Bats are important components of forest ecosystems. The population, behaviour, and space use of forest-dwelling bats are strongly affected by forest composition and structure, and their effects on refuge and prey availability, and predation risk. Hence, bat abundance and activity may be a good indicator of ecosystem quality. (Jones et al. 2009)

Wildfires and prescribing burning have important effects in habitat structure, therefore, in diversity. These changes produce different responses in mammal species (Fisher and Wilkinson 2005). Oddly, there is a scarce investigation focused on the effects over bat communities (Loeb and Waldrop 2008, Law et al. 2018)

In this study, we have compared bat activity in burnt and unburnt, coastal pine afforestation.

STUDY AREA

One of the project's demonstration sites is a stone pine (*Pinus pinea*) afforestation on former cork-oak forest situated at **Doñana Natural Park** (SW Iberian Peninsula) (DNP) (**37°10'N, 6°23'W**; 54 252 ha).

The climate is sub-humid Mediterranean with Atlantic influences and is characterized by a marked annual variability in rainfall. Average yearly rainfall is 580 mm and summers are very dry and hot. Thus, the water balance is generally deficient as rainfall only exceeds evapotranspiration in 3–4 months of the year. The potential vegetation is cork oak (*Oleo-Quercertum suberis sigmetum*).

In 2017 June a wildfire affected more than 8000 ha in DNP.



Fig 1. Stone pine afforestation. a.Unburnt b.Burnt



Fig 2. Study area

METHODS

In early April 2018, we set up two *Willife Acoustics Song Meter SM4BAT FS* detectors in one burnt and other unburnt area (control area). Detectors were placed in a tree at 3-4 metres high, with the microphone oriented towards open areas, and recorded bat activity during three consecutive nights, similar to other studies (Loeb and Waldrop 2007)

Bat pass was counted by means *Scan'R 1.8.5-Software* (Binary Acoustic Technology 2016).

RESULTS

The bat community was composed mainly by 6 common bat species: *Pipistrellus pygmaeus*, *P.kuhlii*, *P.pipistrellus*, *Eptesicus isabellinus*, *Nyctalus spp.*, and *Tadarida teniotis*. There were registered 1704 bat passes in 3067 recordings. Bat activity mean values were higher in **burnt areas** (40.16 bat passes/hour) than in **unburnt ones** (7.16 bat passes/hour).

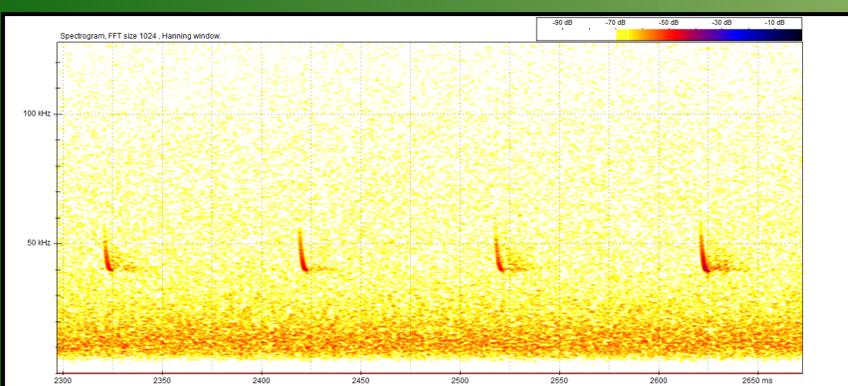
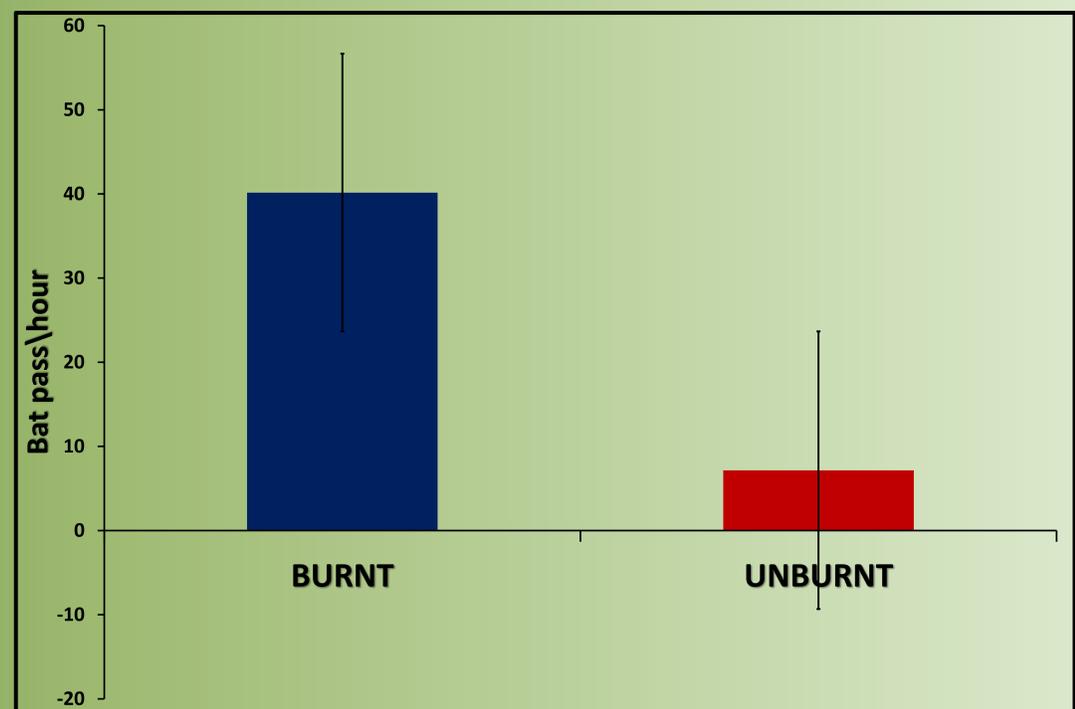


Fig. *Pipistrellus kuhlii* calls in study area.



DISCUSSION

Our results, despite being preliminary, suggest that bats inhabiting stone pine afforestation prefer burnt areas than unburnt ones. It may be due to the increase in prey availability in the first months after wildfire (Loew and Waldrop 2008; Law et al. 2018). Some studies consider that wildfires improve habitat suitability, increasing open areas, and therefore insect overpopulation (Loew and Waldrop 2008; Law et al. 2018).

On the other hand, the habitat structure, quality and configuration in the surroundings, and the different levels of wildfire severity could be decisive in species richness and bat activity in burnt areas (Law et al.2018).

Long term, future work will probably evaluate the effect of prey availability and habitat structure (availability of refuges vs. open hunting areas) on bat abundance and activity, because the evolution of habitat structure in burnt areas could promote different results (Law et al 2018).