Modelling spatial and temporal variation of bark beetle damages on Scots pine mountain forests: site and management influence.

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INTRODUCTION

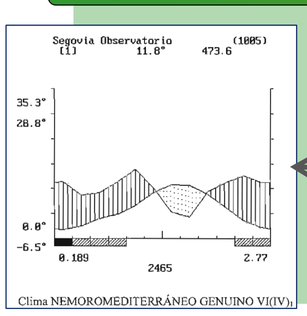
Bark beetles in Mediterranean mountains pinewoods: one of the **major forests biotic disturbances.**

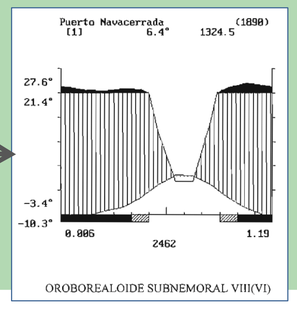
- Economic losses
- Ecological imbalances that can alter ecosystems services and forest management decisions

OBJECTIVE

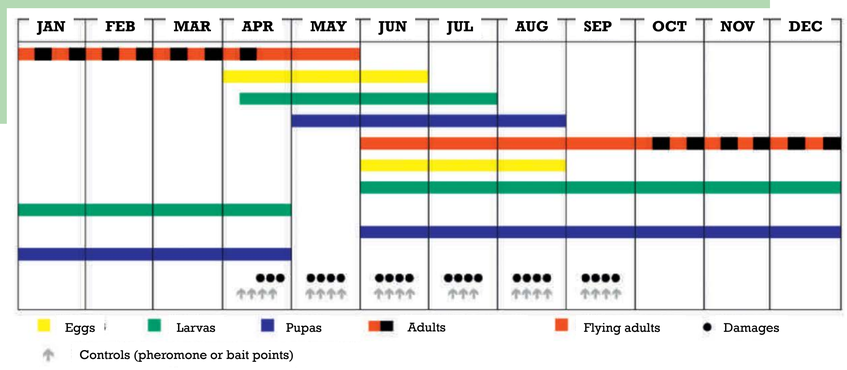
How do ecological and silvicultural factors affect bark beetle infestation?

MATERIAL AND METHODS

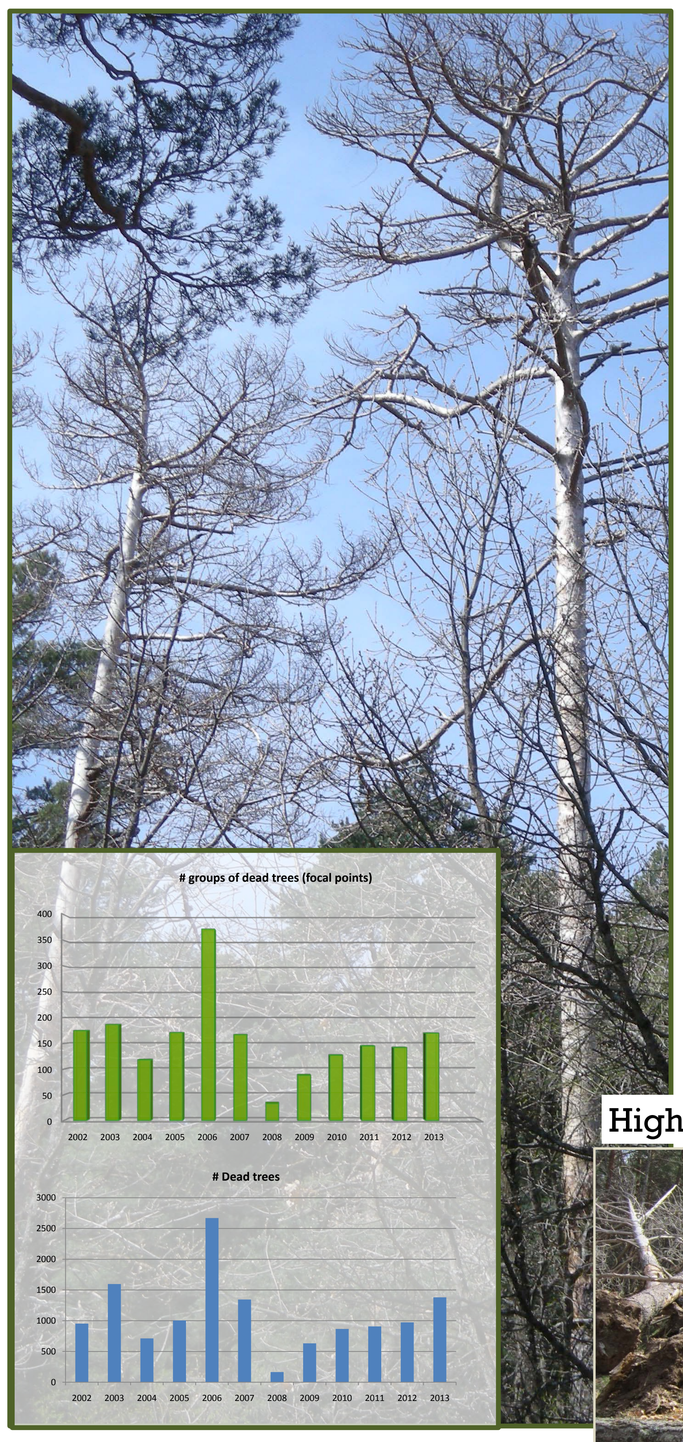




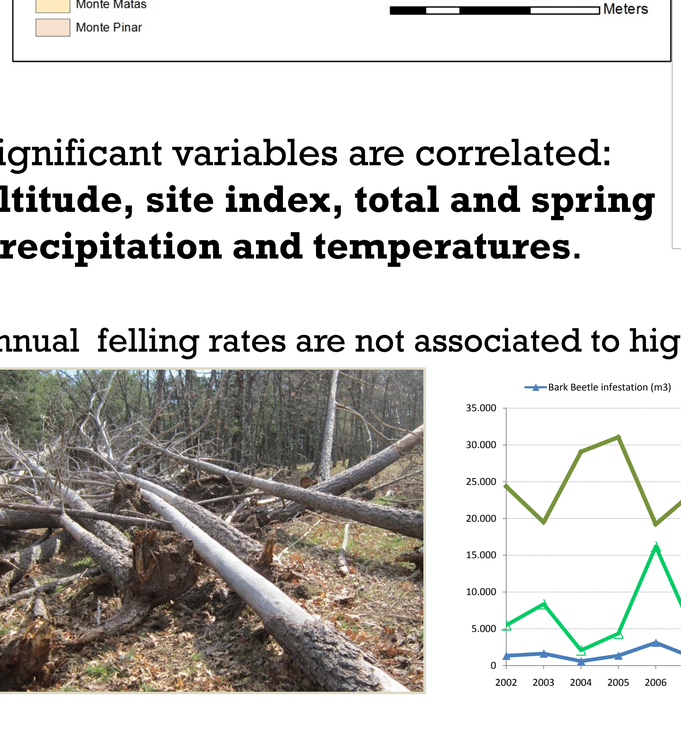
Valsain Forest (10,668 ha), northern slope of Central System (Spain), 1000 -1900 m
GPS location of focal groups of dead trees and bark beetle infestation.
Ecological characteristics and Fellings data of the forest. Scots pine pure and oak mixed stands.
12 years of monitoring (2002-2013)
Manage. plan + Manage. units description and history

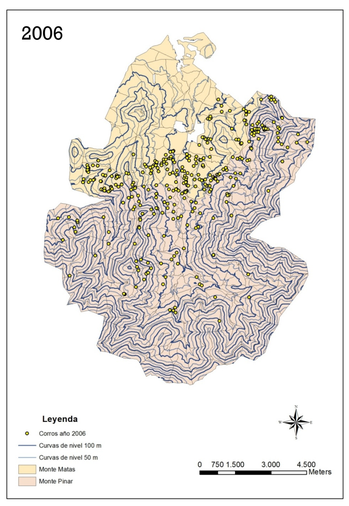


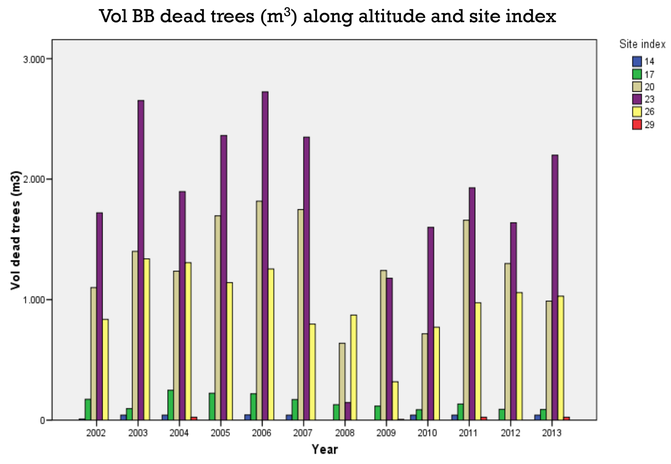
RESULTS

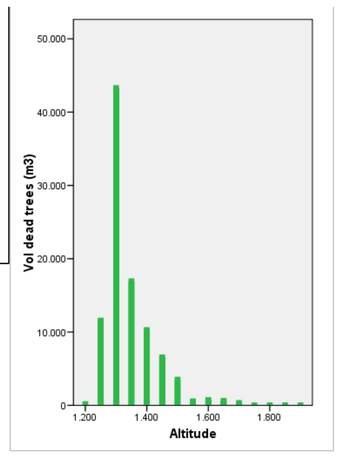


Focal groups of bark beetle dead trees in 12 years show the same location trend for 2006, the year with largest damages in the period.







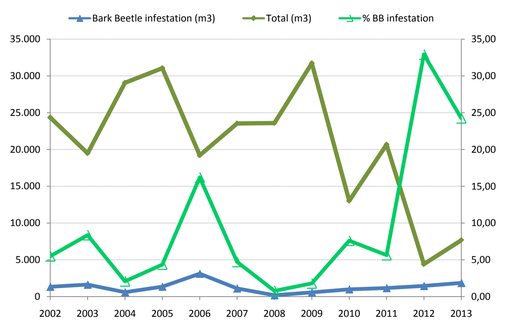


Largest volumes of dead trees by bark beetles infestation at:

1300-1450 m range of altitude
Site index of 20 and 23 m
2006 year (minimun at 2008), inversely proportional to spring precipitation

Significant variables are correlated: **altitude, site index, total and spring precipitation and temperatures**.

High annual felling rates are not associated to high BB damages



CONCLUSION

At the case of study, associated to a continous and careful management during decades,

bark beetle damages are more related to ecological variables than to management variables.

ARANGE PROJECT
ADVANCED MULTIFUNCTIONAL FOREST MANAGEMENT IN EUROPEAN MOUNTAIN RANGES

Mountain Forest Management in a Changing World Conference
Smokovec, High Tatra Mountains, Slovakia. 7-9 July 2015