

Aliens & Flames: exploring the relationships between an aggressive non-native tree species and fire

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Introduction

Acacia dealbata Link., native to Southeast Australia and Tasmania, is one of the most aggressive non-native tree invaders of southern Europe. *A. dealbata* is a fire-adapted species that is able to resprout and germinate after fire. Burned areas are often invaded by a dense mat of new recruits, resulting from a long-lasting fire-stimulated soil seed bank. These dense, monospecific stands have high fuel loads and are prone to new wildfires, eventually leading to a sustained fire-invasion loop. Although fire can be a facilitator of invasion, it may be also a cost-effective tool aimed at controlling *A. dealbata* populations through consecutive burns, under adequate prescriptions. It is thus important to better understand the fire ecology of *A. dealbata* in order to define efficient strategies for its control.



Aims

Aliens & Flames aims to help improving the control of two of the most concerning environmental threats in Portugal: wildfires and alien plant invasions. In this project we will explore the use of prescribed fire to control *A. dealbata* populations. The main objectives are: a) to provide technical guidelines that allow reducing the risk of invasion in areas where prescribed fire is applied as a fuel management tool; b) to develop an alternative technique to control plant invasions; c) to improve the forecasting of plant invasion in burnt areas; d) to elaborate fuel models for areas invaded by the study species; e) to inform forest owners about the problem of alien plant invasions in burned areas.

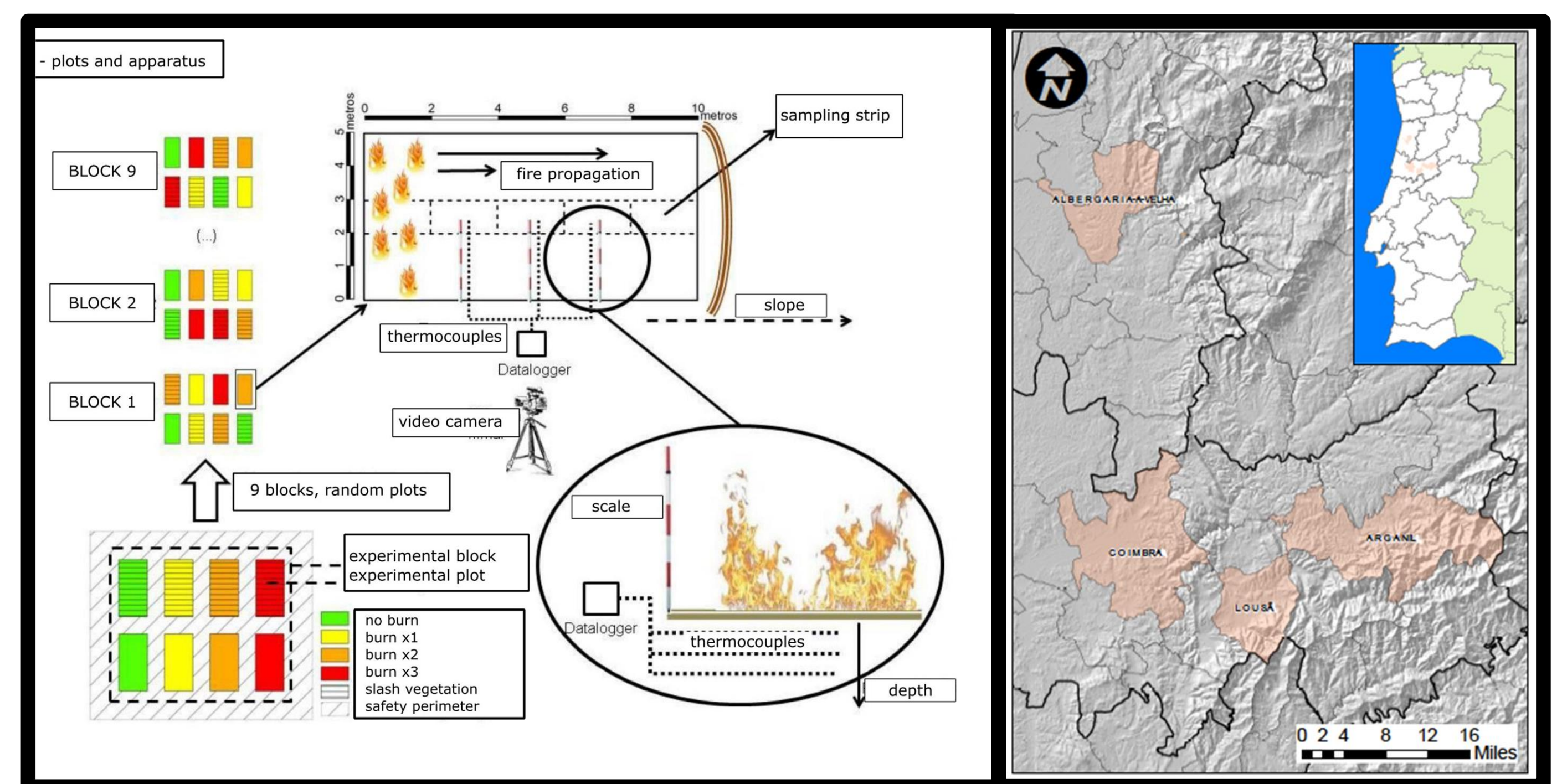
Methods

In this five-year project, a set of experimental burns will be conducted in invaded areas in central Portugal (figure 1) featuring different treatments:

- slash;
- burn (including consecutive burns);
- slash and burn.

Data will be collected before, during and after the burns, including:

- floristic composition and structure;
- seed bank properties;
- plant demography;
- fire behaviour parameters;
- soil characteristics;
- post-fire erosion.



Expected results

The project will allow a better knowledge of the two-way relationships between fire and *A. dealbata*.

This knowledge will allow producing a guide for using prescribed burning in areas invaded by *A. dealbata*.

Conclusion

Aliens & Flames is an innovative research initiative that gathers two branches of science that have been travelling separate paths and have never been explored together in fire-adapted, non-native trees in Europe: fire behaviour and invasion ecology.