

Biological invasions as natural hazards: towards building a strategy to cope with invasive alien plants

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INTRODUCTION

Biological invasions and Natural hazards are comparable phenomena that are becoming more and more frequent and severe worldwide and should be managed in a similar way.

AIMS

In this project we developed a Risk analysis scheme to evaluate the risk of alien invasive plants hazard in Lesvos Island, Greece. This data will support stakeholders to structure successful cost-effective management strategies and define their priorities.

METHODS

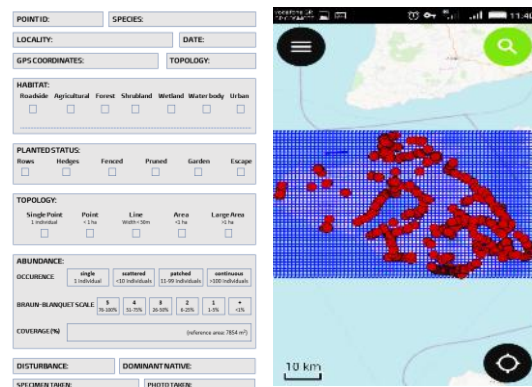
We applied an integrated framework that combined four essential elements: i) alien species survey, ii) mapping of their distribution, abundances, and habitat preferences, iii) risk assessment, focusing on the likelihood and consequences of the invasion hazard, and iv) ecosystem impact assessment, focusing on effects to biodiversity and ecosystem functions.

OUTPUTS

We expect to produce a detailed list of alien species, explore and visualize the spatial patterns of their occurrences, deliver alert lists of the most invasive ones, and estimate their current and future ecosystem impacts.

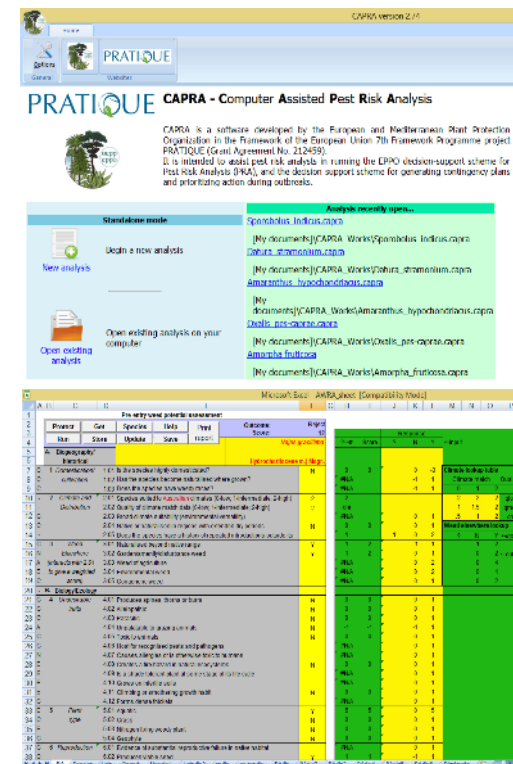
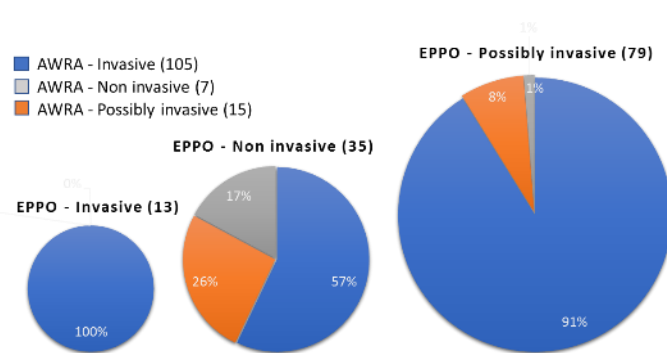
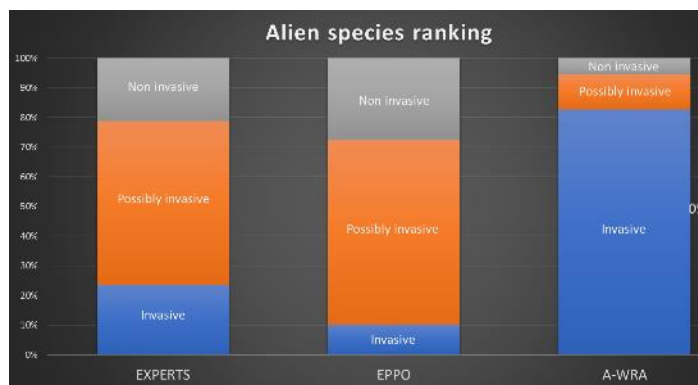
PRELIMINARY RESULTS

In total, 151 alien plant taxa from 53 different families were found. The most abundant families were Asteraceae (10%), Amaranthaceae and Poaceae (9%), and Fabaceae (7%). The most common profile of the recorded alien species stands for an *annual herb of ruderal & agricultural habitats*.



Two Risk Assessment protocols, focusing on the likelihood and consequences of the invasion hazard, were implemented: the European and Mediterranean Plant Protection Organization (EPPO) prioritization scheme, and the Australian Weed Risk Assessment (A-WRA). A subset of 127 species, which excluded plant species with rare occurrences and no documented impacts, was assessed. Each screening method classified aliens as **invasive**, **possibly invasive**, and **non-invasive**. To benchmark their performances, we compared the results of the two methods with a third independent invasiveness estimation made by a panel of experts at national level.

According to the EPPO scheme, 10% of species categorized as invasive, 62% as possibly invasive and 28% as non-invasive. The A-WRA method is stricter, classifying 83% of species as invasive, 12% as possibly invasive and only 6% as non-invasive. Compared to expert's opinion, EPPO scheme indicated a 10% match for invasive and a 22% for non-invasive species, whereas A-WRA an 83% and 7% respectively.



Main differences are due to the diverse input data each protocol requires, and to differences in the relevant importance of that data to the final ranking. A-WRA is a precautionary method that rejects even minor invaders, whereas EPPO method is a rapid prioritization tool that provides information for a subsequent appropriate Risk Analysis.

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Habitat type

Ruderal & Agricultural (90%)

Cliffs, walls (3%)

Coastal (3%)

Woodlands & scrub (2%)

Freshwater (2%)

Growth form

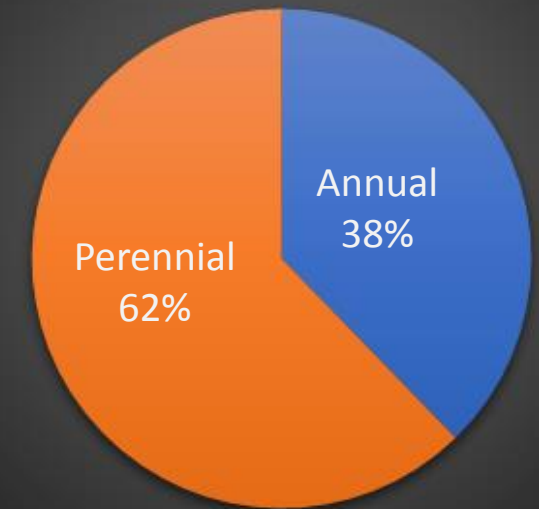
Herbs (59%)

Trees (17%)

Shrubs (17%)

Sub-shrubs (7%)

Life span



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Operational Programme
Human Resources Development,
Education and Lifelong Learning
Co-financed by Greece and the European Union



This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme "Human Resources Development, Education and Lifelong Learning 2014-2020" in the context of the project "An Integrative Framework for the Study of Alien Flora" (MIS 5049419)