



# Book of Abstracts

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## O47

### Impacts of non-native nitrogen-fixing trees in Italy: evidence from the invasion of *Acacia* s.l. and *Robinia pseudoacacia* (Fabaceae)

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#### Abstract

Non-native nitrogen-fixing trees are known to be among the most harmful invasive alien plants (IAPs), although their negative impacts on the ecosystem have not always been assessed in the different parts of the invasive range. The assessment of the impacts of these IAPs appears of relevant interest for an informed prioritization of the management efforts. We aimed at providing evidence on the ecological impacts of the main invasive nitrogen-fixing trees in Italy in a number of habitat types.

Accordingly, we started, within the Alien Species Working Group of the Italian Botanical Society, a sampling of several case studies of invasion on the whole national territory, through paired vegetation plots (invaded vs non-invaded) for different target IAPs, invaded native habitats and areas/regions. The sampling design foresees the survey of structure and biodiversity of native and invaded plant communities. We included an assessment of the impacts on the topsoil via profile photos and analysis of the main chemical characteristics (N-C-P and pH) of soil samples (A and O horizons).

More than 300 plots have been sampled in 8 regions (Calabria, Lazio, Molise, Apulia, Sardinia, Sicily, Tuscany, and Trentino Alto-Adige) for 5 species all belonging to Fabaceae: *Acacia dealbata*, *A. mearnsii*, *A. saligna*, *Vachellia karroo* and *Robinia pseudoacacia*, and further data was collected during spring 2022. We individuated more than 15 different natural vegetation types invaded (including habitats worthy of conservation according to Dir. no. 92/43/EEC). The impacts on biodiversity indices such as species richness, plant abundance and cover of canopy and shrub layer, showed high variability among the different IAPs and habitats, but with a general trend towards a degradation of the native biodiversity. The soil profiles showed relevant patterns of changes in the soil horizon stratification, most likely due to the changed condition of litter accumulation and degradation.

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### **Terrestrial and freshwater alien invertebrates in Sicily and Malta (Central Mediterranean)**

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#### **Abstract**

The Mediterranean is an important biodiversity hot-spot of global importance. Due to their central and strategic positions which allow for many commercial, cultural and international transit exchanges, the islands of Sicily and Malta also tend to be on the front line of the arrival of new alien organisms which threaten local biodiversity. The “FAST” Project (Fight Alien Species Transborder) aims to safeguard the biodiversity of the two islands by directly counteracting the phenomenon of biological animal and plant invasions. To this end, it was fundamental to build an up-to-date database of non-indigenous terrestrial and freshwater animal taxa with particular attention to invasive alien species (IAS), highlighting for each species the introduction pathways, ways of dispersion and degree of invasiveness in the two islands. The creation of such a database is a prerequisite for any future work related to the management of such organisms in the field (containment/eradication of IAS), citizen science (dissemination of knowledge) and export of management models of IAS applicable to other territories. The construction of the database required consultation of the main international databases (DAISIE, ISSG, CABI, GRIIS, GBIF); national databases (the checklist of the Italian fauna, speciesinvasive.it); various publications concerning single taxa or groups of taxa occurring in Central Mediterranean territories; as well as the addition of unpublished data collected personally by scientists involved in the project. Database construction was nevertheless met with difficulties such as prolific discrepancies in the sources consulted and considerable gaps in ecological and ethological knowledge on some taxa. For species introduced before the year 1500 and which have since become naturalized, the term “parautochthonous” was used. In the two islands, over 900 species of non-indigenous and cryptogenic species have been identified so far.

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### **A database of alien plants present in Sicily and Malta: a comparison between two close Mediterranean islands with a common management plan**

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#### **Abstract**

The development of a common database of alien plant species present in Sicily and Malta is one important target of the FAST project funded under Interreg V-A Italia-Malta 2014-2020 call 2/2019. The project, in full coherence with European strategy for the protection of the biodiversity, will counteract the introduction, naturalization and spread of invasive alien species (IAS) that damage the natural and seminatural environments in Sicily and in Malta by means of: (i) their recognition and categorization within priority's scale; (ii) their control and/or eradication in some Natura 2000 sites; (iii) the identification and management of pathways and the means of introduction and dispersal; (iv) the data processing of guidelines and adoption of best practices and (v) education and environmental awareness by several means of communication.

Our work, has made it possible to create a common database of the alien plant species recorded from the two islands. Data was retrieved from both the scientific literature and from our own field studies. This made it possible to quantify the alien species reported so far for the two islands (almost 600 in Sicily and over 450 in Malta) as cryptogenic, casual, naturalized and invasive. The comparison between the alien plants present in Sicily with those present in Malta highlighted the fact that even though the habitats and the surface area are different, the number of alien species is high on both islands and many species are also in common to both. Some alien taxa invasive to Sicily have yet to arrive in Malta. Hence the need to develop effective prevention strategies.

Using a prioritization scale, a small number of species that are mostly invasive or that potentially could become more invasive were chosen (about 150 for Sicily and 100 for Malta), of which most are in common to both islands.

## Application of spectral signature of selected Invasive Alien Plants (IAPs) of Malta and Sicily for ecological monitoring

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### Abstract

The detection and characterization of spectral signatures offer an efficient and cost-effective method for the assessment and monitoring of the distribution range of IAPs. The development of geospatial technology, specifically remote sensing, is no longer limited to satellite imagery. In fact, in the last decade, consumer-grade Unmanned Aerial Vehicles (UAVs) have extended the accuracy of vegetation mapping.

Spectral characterization of the most widespread IAPs of the Maltese Islands (including *Agave* spp., *Ailanthus altissima*, *Arundo donax*, *Cardiospermum* spp., *Ricinus communis* and *Opuntia ficus-indica*) is being used to produce vegetation maps in Special Areas of Conservation (SACs) of the Maltese Islands, including L-Inħawi tax-Xlendi u tal-Wied tal-Kantra (Gozo); Rdumijiet ta' Malta: Mix-Xaqqa sal-Ponta ta' Bengħisa (western coast of Malta) and Il-Magħluq tal-Baħar ta' Marsaskala (southern Malta). All mentioned localities are protected areas of the Natura 2000 network of the Maltese Islands.

Using open access satellite imagery available from the USGS Earth Explorer portal, published data from the SIntegraM project and novel material from dedicated UAV surveys, the spatial distribution and range expansion of IAPs will be assessed and validated by ground-truthing. The variability of the spectral signature due to the species phenology and seasonal illuminance is considered in the classification method used for the vegetation mapping.

The workflow of the methodology will be easy to follow, accessible to everyone and reproducible. The dynamic mapping of IAPs over time would set the baseline for future conservation measures and facilitate the science-based management of the protected areas.

This work is supported by the FAST Project "Fight Alien Species Transborder" Programme INTERREG V-A Italia-Malta 2014–2020.

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### **Fighting Alien Species Trans-border. A Citizen Science perspective**

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#### **Abstract**

Citizen Science has come a long way since the voluntary collection of specimens by naturalists in the 16th and 17th Century. Indeed, developments in information technology and recent trans-disciplinary collaborations have transformed the efforts of once solitary individuals into an environmental movement with the potential to address important international issues. One such collaborative project is Interreg's Italia-Malta's FAST project (Fighting Alien Species Trans-border) which aims to counteract the introduction, naturalisation and spread of invasive alien species which pose a threat to the ecology of several high nature value sites within Sicily and the Maltese archipelago. The choice of these islands is important for their trans-border role in the Mediterranean region.

Although there are numerous Citizen Science projects currently being undertaken globally, the FAST project is unique for the Maltese Islands in the sense of it being the first national BioBlitz organised on the Islands. The bioblitz will be targeting a Natura2000 site over four days. Participants will be receiving data-collection training for invasive species before joining the bioblitz. At the end of their participation, Citizen Scientists will be asked to fill a standardised international survey developed by European BioBlitz Network (DITOs Consortium 2019).

During this presentation talk we will be discussing the conservation impact of this rapid data collection of invasive species in a protected site as well as the motivations of the participants to continue volunteering as Citizen Scientists in the future.

# EFFECTIVENESS OF PAST AND CURRENT CONTROL MEASURES AND NATIVE COMMUNITIES RESTORATION EFFORTS

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## Management towards the eradication of *Pennisetum setaceum* from the island of Gozo

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### Abstract

*Pennisetum setaceum* has become a serious invasive species in many coastal areas and islands situated in the southern parts of Europe, including the Canary Islands, Madeira, Sardegna, Sicily and the Maltese Islands. It soon became an invasive alien species of EU concern when the European Commission, by implementing Regulation 2017/1263, obliged member states to manage and restrict the spread of the species. In a short time from its first introduction in the Maltese Islands (around the year 2007), the species had escaped considerably both in mainland Malta and in Gozo – the second-largest island of the Maltese archipelago with a surface area of 67 km<sup>2</sup>. It first escaped in urban areas and later spread in some rural communities, including Natura 2000 sites. In 2017, the EcoGozo Directorate within the Ministry of Gozo embarked on a mission to control and possibly eradicate this alien grass from Gozo. With restricted personnel and budget but a wise strategy, about 90% of the *Pennisetum* population recorded in at least 65 locations has been eradicated within five years of operation. Several simple strategies have been adapted, which have resulted in the desired accomplishment. This presentation gives a brief account of how this was achieved and what strategies have been used, namely Citizen Science and media technology for mapping, persistent monitoring, public involvement, and site-specific solutions for removing the plants from the various habitats in Gozo. Repeated interventions allowed us to reach some observations on how to prevent regrowth and that was instrumental in preventing the spread of plants and seeds. Some NGOs, local councils, and the Environment Resource Authority have also played helpful roles in this success story, which still does not have a jovial end because the ecology and surviving adaptations of *Pennisetum setaceum* are enormous.