

Spatiotemporal dynamics of invasive plant species in insular systems

PhD position

UMR PVBMT, CIRAD, France

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Background

Tropical insular ecosystems are the most impacted ecosystems by biological invasions, which threaten biodiversity. In order to control biological invasions, it has been shown that management interventions should be implemented as early as possible in the invasion process before an introduced species become too widespread. However, one of the challenges is to predict which introduced species will become invasive and where they could spread. This has considerable implications for management, as it is currently difficult for decision-makers and practitioners to prioritise which species to deal with first and where to intervene. In order to improve our understanding and the management of invasive plant species, spatio-temporal models are needed to understand and predict the future spread of major invasive and emerging exotic plant species.

This PhD position is part of a broader research-action partnership between the National Park of Reunion and CIRAD, in collaboration with the South African National Park. The incumbent is expected to deliver implementation-relevant research. A series of regular workshops will be organised with park managers to co-develop research questions and establish research-induced implementable solutions in a collaborative approach.

Objectives of the PhD

- Modelling the spatiotemporal dynamics of invasive plant species with known or expected high impacts by integrating ecological processes
- Assessing changes in invasion degree over time to identify expected invasion fronts at spatial scales relevant for decision-making (whole-island) and for implementation (site-level)
- Comparing the dynamics of invasive species common to La Reunion National Parks and Table Mountain National Parks

Methodology

Study sites: La Reunion National Parks and possibly Table Mountain National Parks

Identify which species to model through a rapid assessment of their impacts (EICAT approach)

Modelling of key ecological processes with the Ocelet modelling platform

Developing a field-based approach for monitoring changes in invasion degree over time at site level

Incorporating different control strategies in the model to compare their efficacy in reducing the spread of invasive species in two national parks

Expected results and outcomes

Better understanding of key ecological processes driving plant invasions

Modelling the impacts of invasive species through space and time

Prioritisation of species and areas for control

Improved decision-making through action research

Candidate profile

Master degree in systems biology, ecology or environmental sciences

Good understanding of the invasion process with some experience in tropical ecosystems

Practical knowledge of a computer language for data analysis

Experience in analysing and processing geo-information

The PhD student will register at the University of Reunion Island and will be based at the Plant Protection Hub (3P) at CIRAD, Saint Pierre, Reunion Island.

Stipend: approximately 1500 euros (net) per month (3 year contract starting October 2021).

To apply and to find out more about the position, send a CV and a motivation letter to M Rouget (mathieu.rouget@cirad.fr). The position will remain open until a successful candidate has been found.