Plant conservation: from fundamental questions to practical actions

Olivia Rusconi^{1,2}, Edward A.D. Mitchell^{2,3}, Yannick Storrer⁴, Claire Le Bayon¹ and Sergio Rasmann¹

1) Laboratory of Functional Ecology, University of Neuchâtel, Switzerland; 2) Laboratory of Soil Biodiversity, University of Neuchâtel, Switzerland; 3) Botanical Garden of Neuchâtel, Pertuis-du-Sault 58, 2000 Neuchâtel, Switzerland, 4) Fauna, Forests and Nature Cantonal Service, Rue du Premier-Mars 11, 2108 Couvet, Switzerland

Background

- We are currently facing the Earth's sixth mass extinction and many species, including plants, are drastically declining worldwide.
- Orchidaceae, due to their complex biology, is a relevant example of a highly endangered group.
- While there has been a lot of research on Orchidaceae and their ecology, populations are constantly declining. Therefore,

an integrated conservation research program that links different temporal, spatial and functional axes is needed.

General aim

- Develop practical integrated conservation approaches for plant species that include fundamental knowledge of their natural history, biology, ecology, demography and genetics.
- Each of these axes form a separate thesis objective, which will be finally integrated into a practical conservation plan.

Model species

- Cypripedium calceolus L. (Orchidaceae)
- Globally vulnerable and locally threatened
- Complex and poorly understood ecology
- Numerous conservation plans but few results

Objective 1

Relationship between

Objective 2

Genetic structure of

Objective 3

Mycorrhizal symbioses across

Objective 4

Impact of vegetation type

pollinator diversity and plant

fitness

Methods



Pollinator collection



populations in relation to their demography

Methods



Leaf collection



Population inventory

space and time

Methods



Root collection



Soil metabarcoding

and structure on populations' decline

Methods



Vegetation inventory



Vegetation structure inventory

Expected outcomes and future challenges

- Use all the collected data to define a practical conservation strategy for *C. calceolus*.
- Generalize this strategy and these results to other plant species.
- Conserve plant species more efficiently with integrated methodology.







Swiss Academy of Sciences Akademie der Naturwissenschaften Accademia di scienze naturali Académie des sciences naturelles



Contact:Olivia RusconiLaboratory of Soil BiodiversityLaboratory of Functional EcologyUniversity of Neuchâtelolivia.rusconi@unine.ch

