



Management of *Marsilea strigosa* Willd.
according to the plant point-of-view.



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Marsilea strigosa as a target species

- Restricted to mediterranean temporary ponds
- Distributed in Spain, France, Italy, Egypt, Algeria, Morocco and south Siberia
- Low genetic diversity
- Active clonal and sexual reproduction

Rhizome and
stolonifer structures

Sporocarps



Marsilea strigosa as a target species

- 8 (of 10) ponds from the Balearic Islands were surveyed: 6 in Majorca and 2 in Minorca
- Total node number (vegetatives and reproductives)
- Topographic basin survey
- Mean water level
- Coordinates of *Marsilea* nodes
- Soil cover

Marsilea strigosa as a target species



Marsilea strigosa as a target species



Marsilea strigosa as a target species

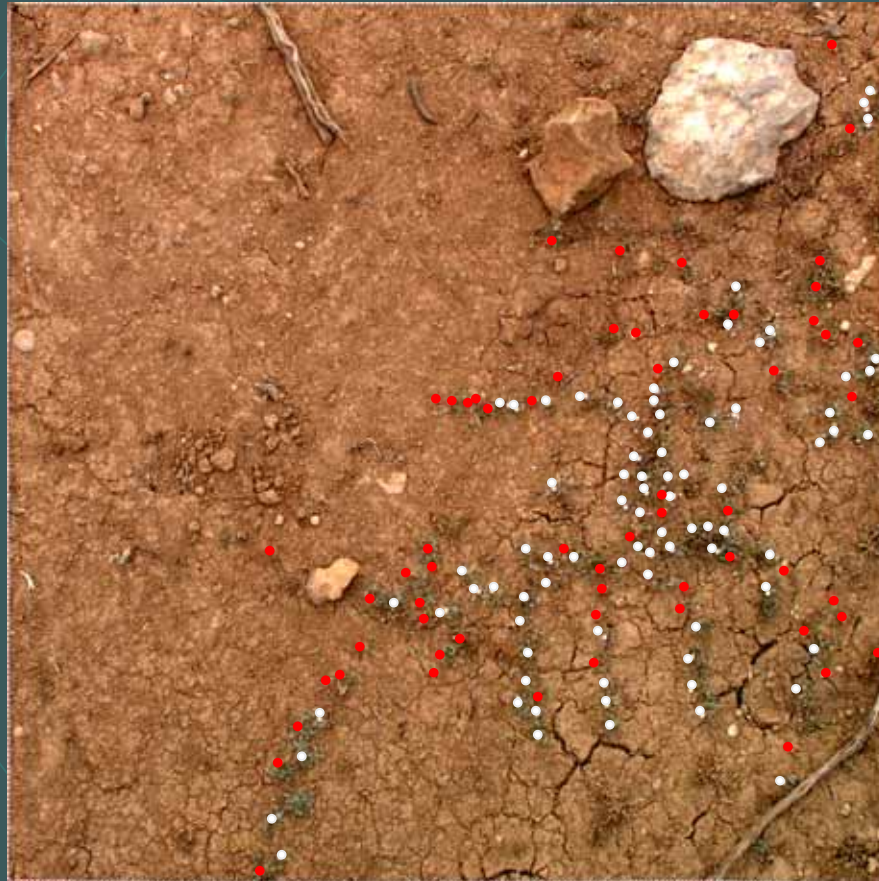


Marsilea strigosa as a target species



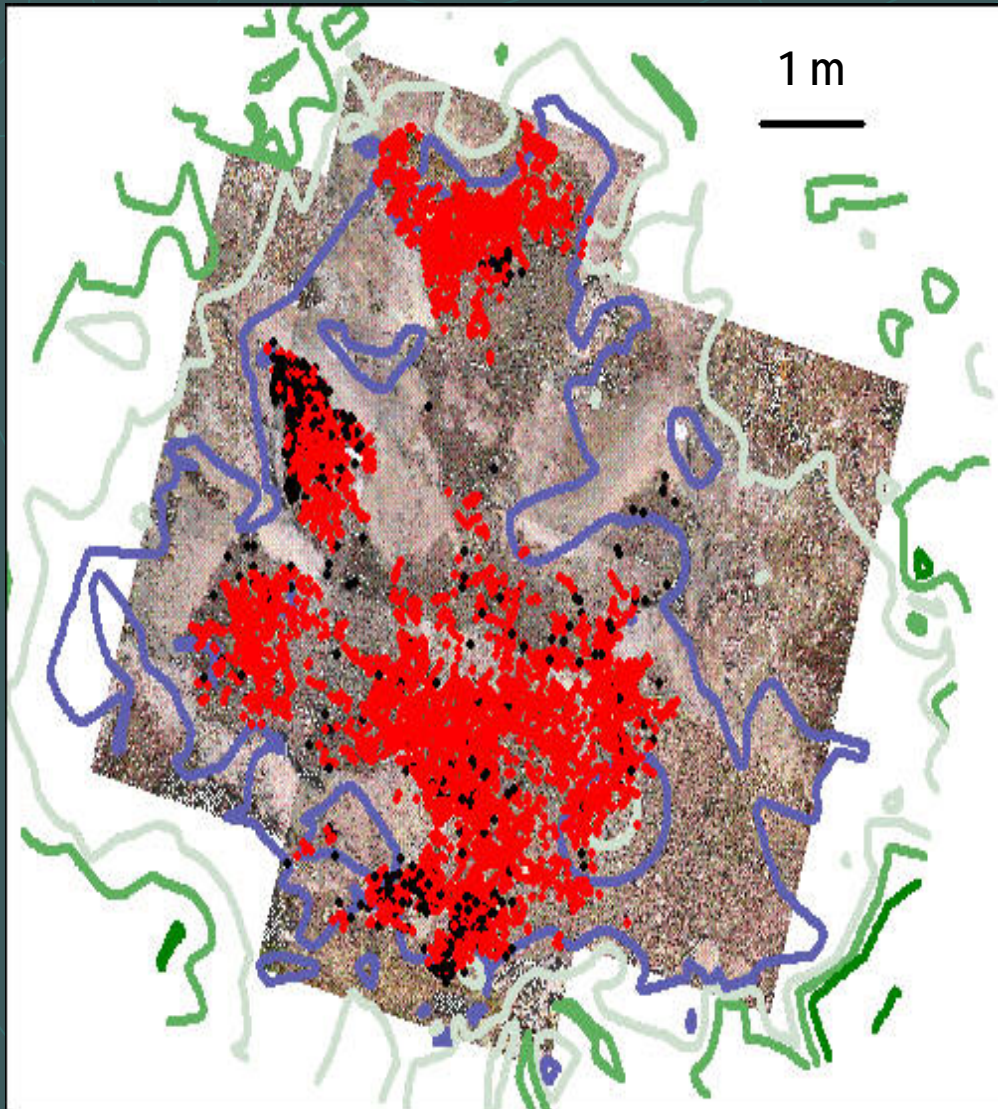
x

Marsilea strigosa as a target species



x

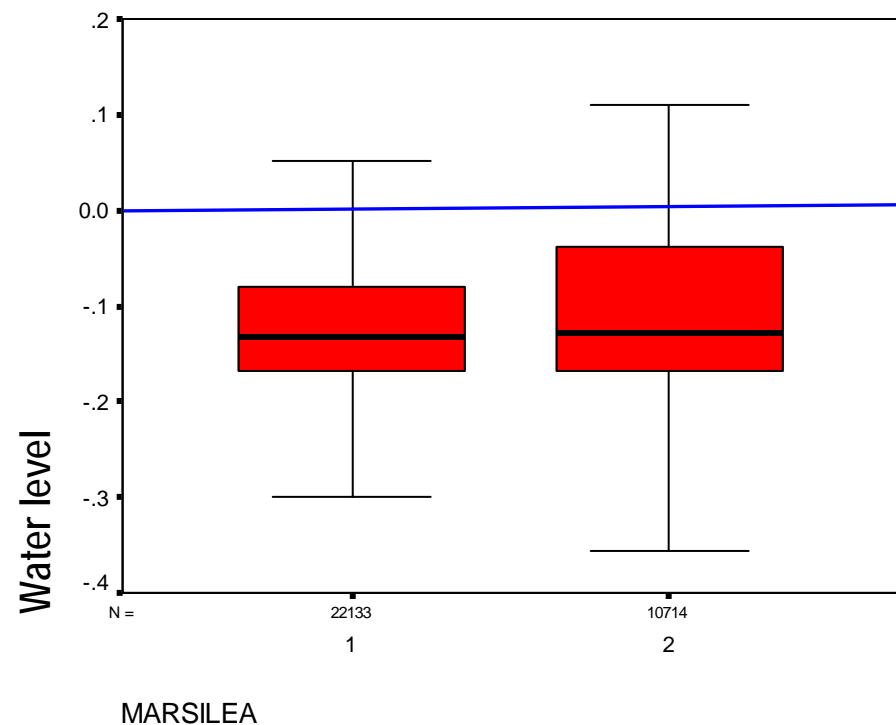
Marsilea strigosa as a target species

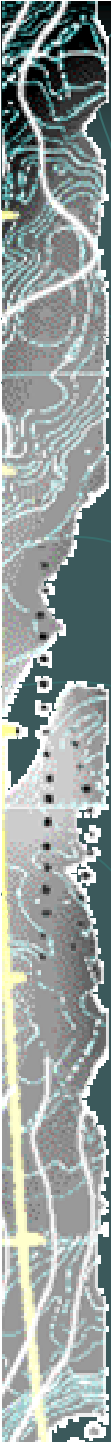


x

Has *Marsilea strigosa* different ecological requirements to grow and to produce spores?

- Is there any relation between pond profile and reproductive strategy?



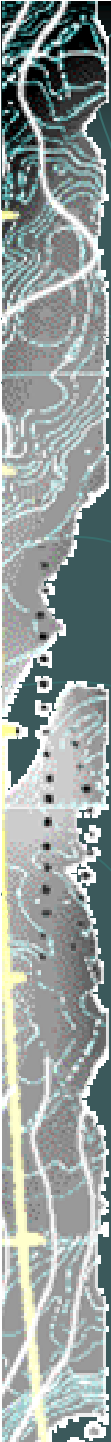


Has *Marsilea strigosa* different ecological requirements to grow and to produce spores?

- Are there places more suitable for sexual reproduction in the pond?

Logistic regressions were performed considering vegetative nodes *vs.* absences and sexual nodes *vs.* absences (true absences)

Validation with an external sample was also performed (25%)



Has *Marsilea strigosa* different ecological requirements to grow and to produce spores?

Vegetative nodes:

$$Y = -9.00 + 1.00 * [\text{transX}] + 0.01 * [\text{transY}] + 0.48 * [\text{dist2shore}] + 0.25 * [\text{dist2deep}] - 36.21 * [\text{transShore}] - 5.377632 * [\text{transCotaMin}]$$

Classification of independence sample: 99.20%

	Pred.	Pred.	%
0	18615	11	99.94
1	267	16328	98.39

Sexual nodes:

$$Y = -8.00 + 1.00 * [\text{dist2shore}] + 0.77 * [\text{dist2deep}] - 59.39 * [\text{transShore}] - 9.23 * [\text{transCotaMin}]$$

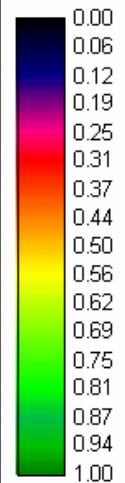
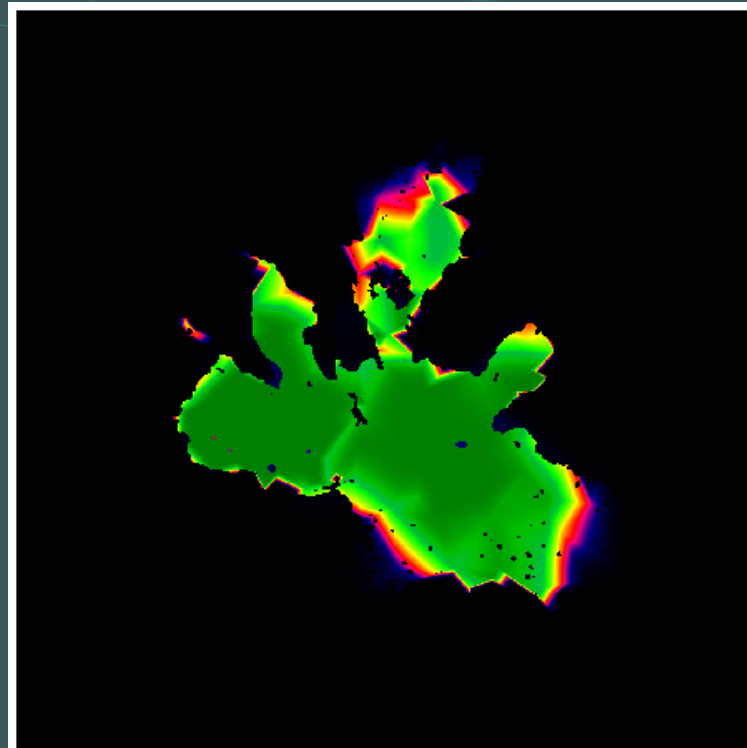
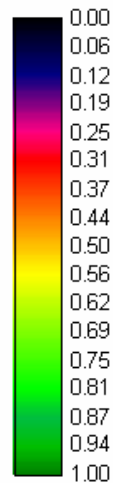
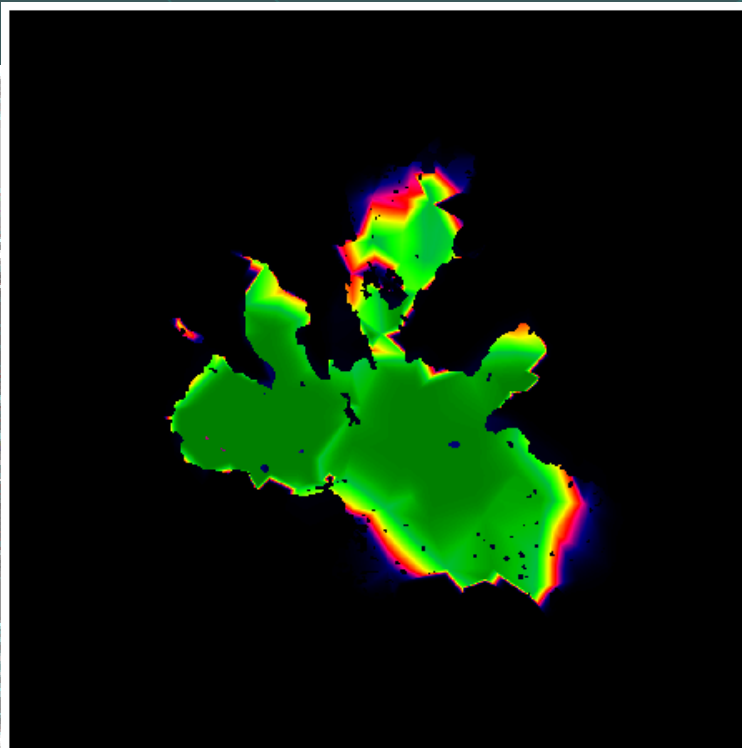
Classification of independence sample: 99.87%

	Pred.	Pred.	%
0	8107	22	99.73
2	94	7920	98.83

Has *Marsilea strigosa* different ecological requirements to grow and to produce spores?

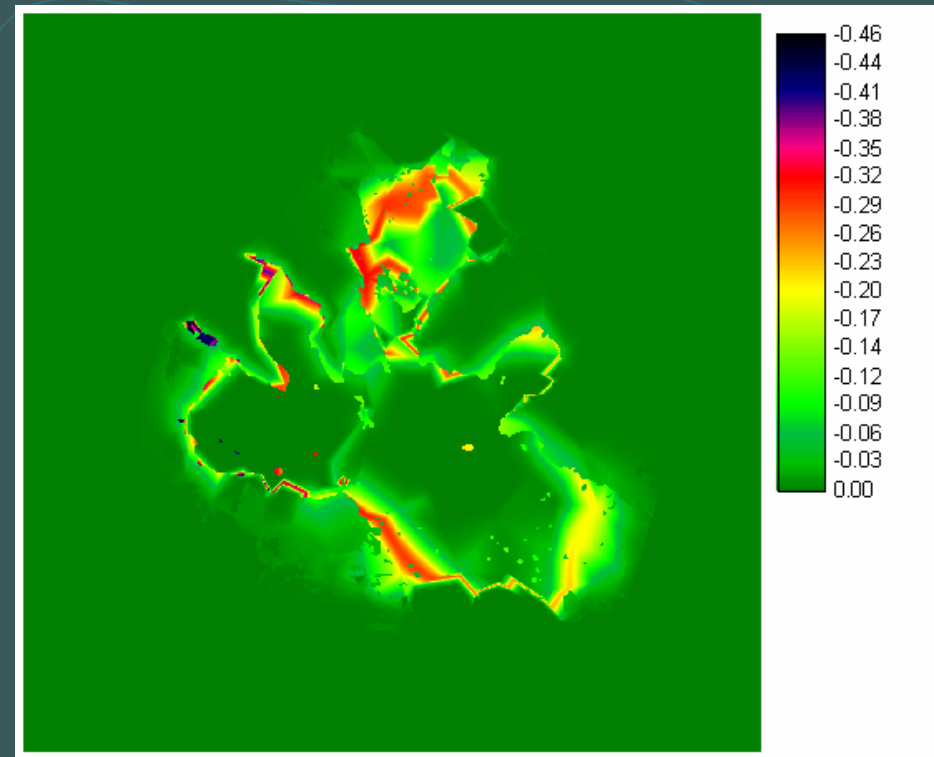
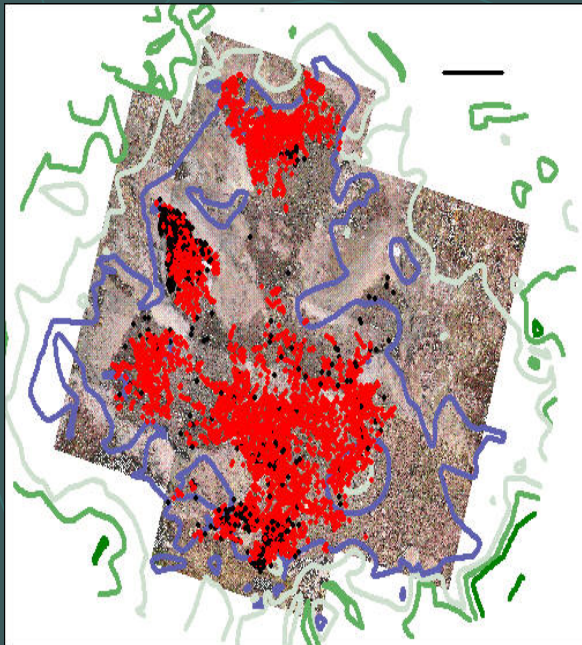
Vegetative

Sexual



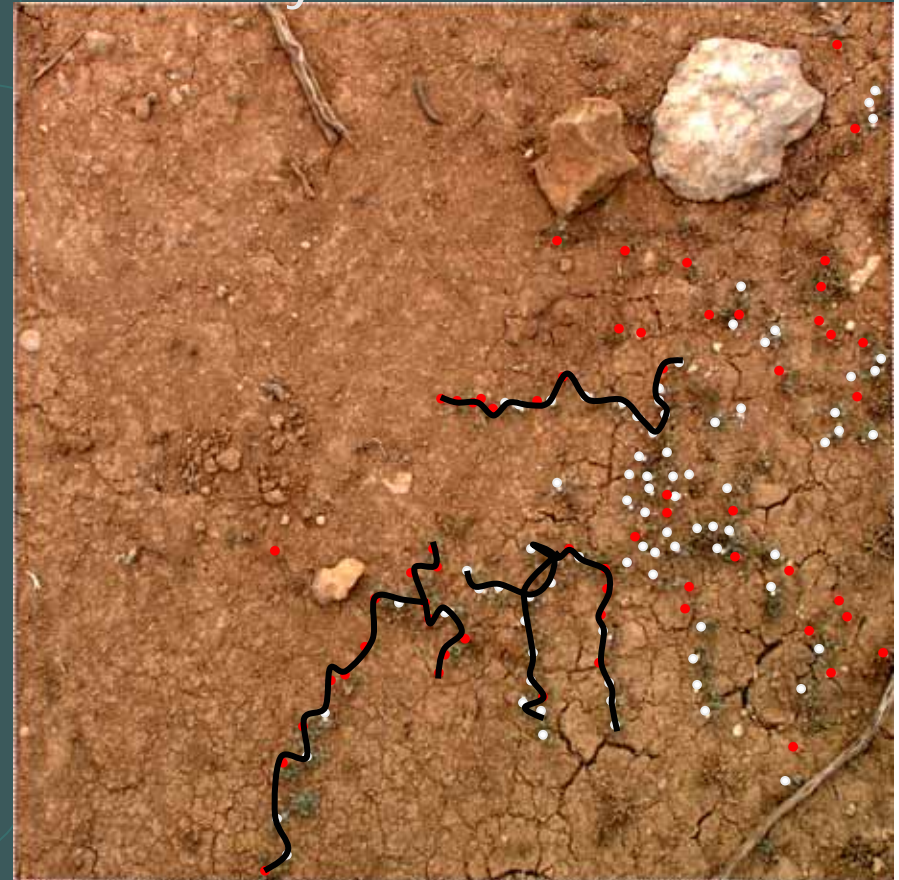
Has *Marsilea strigosa* different ecological requirements to grow and to produce spores?

- Main differences between vegetative – sexual behaviour



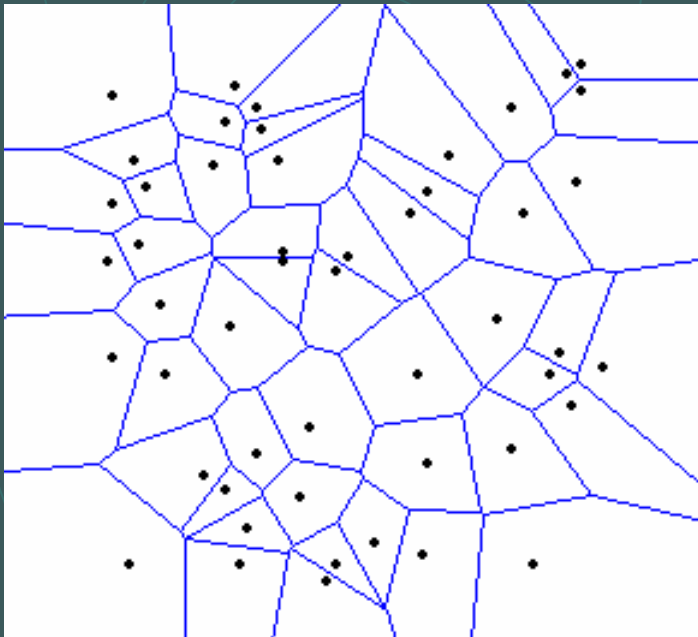
Which other morpho-ecological data can we obtain?

- ▣ Which is the spatial pattern of the nodes?
 - Distance between nodes, connectivity



Which other morpho-ecological data can we obtain?

- Needs on area/node and reproductive strategy



Vegetative minimum area is 1cm^2
Sexual minimum area is 4cm^2



Which other morpho-ecological data can we obtain?

- Can the populations grow?

According to our results the population can grow in area near 2 times its present occupation (525 m²)



Importance of models in threatened populations:

Define the habitat requirements of threatened species

Understand if population growth is restricted by absence of adequate space

Define the areas with more available space

Provide important information to the definition of actions

Thank you for your attention

Acknowledgements

All people that collaborated collecting data:

Maria José Albert

Nelly Alanoka

Isabel Marques

Pere Fraga LIFE2000NAT/E/7355



Josep Lluís Gradaille

Magdalena Vicens