The importance of monitoring translocations for a long-time period. The case of a hybridization of a narrow endemic species from Balearic Islands, *Helosciadium bermejoi*

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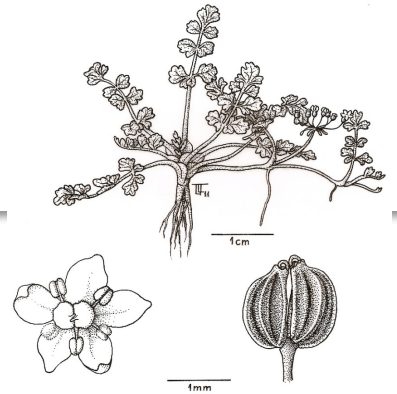

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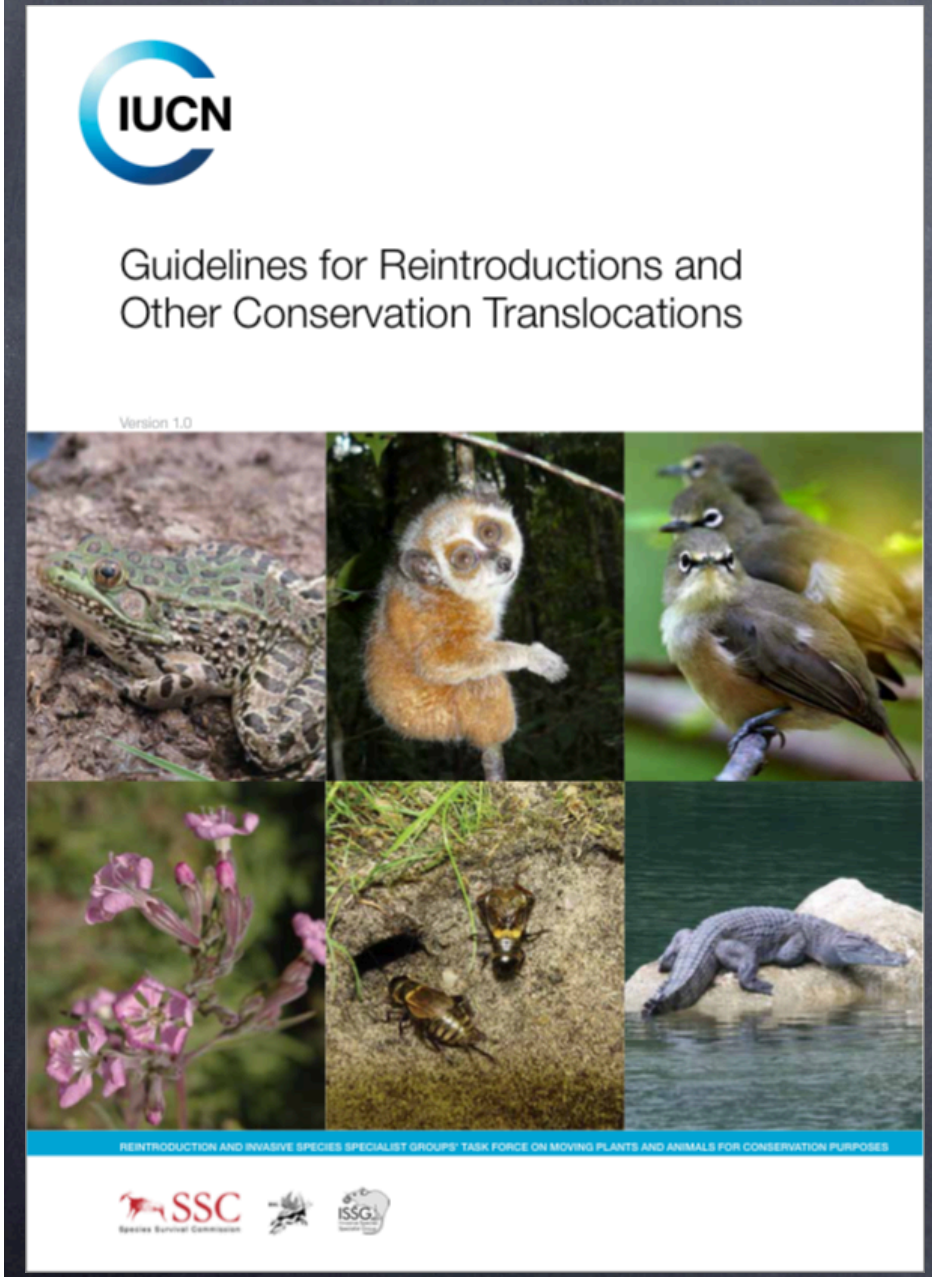
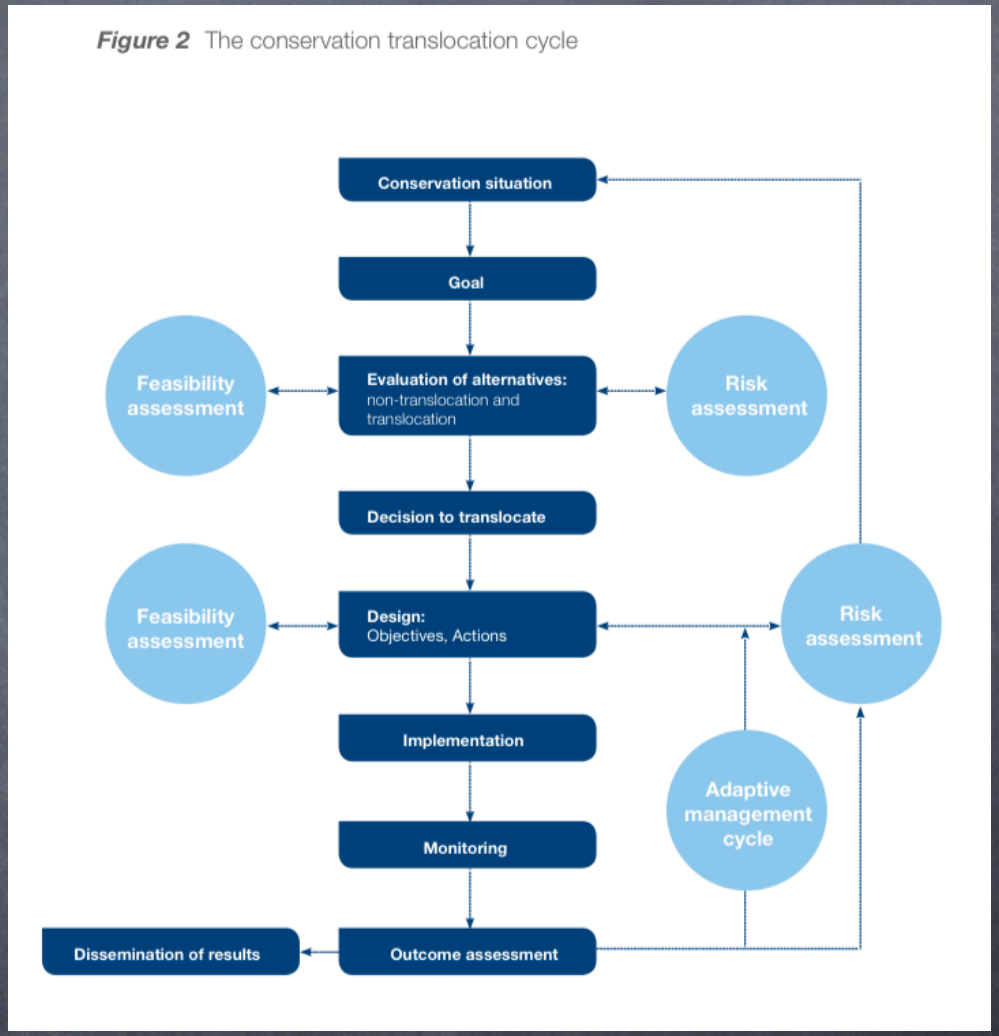
Hybridization is a risk to the survival of threatened species





Flow scheme of a traslocation

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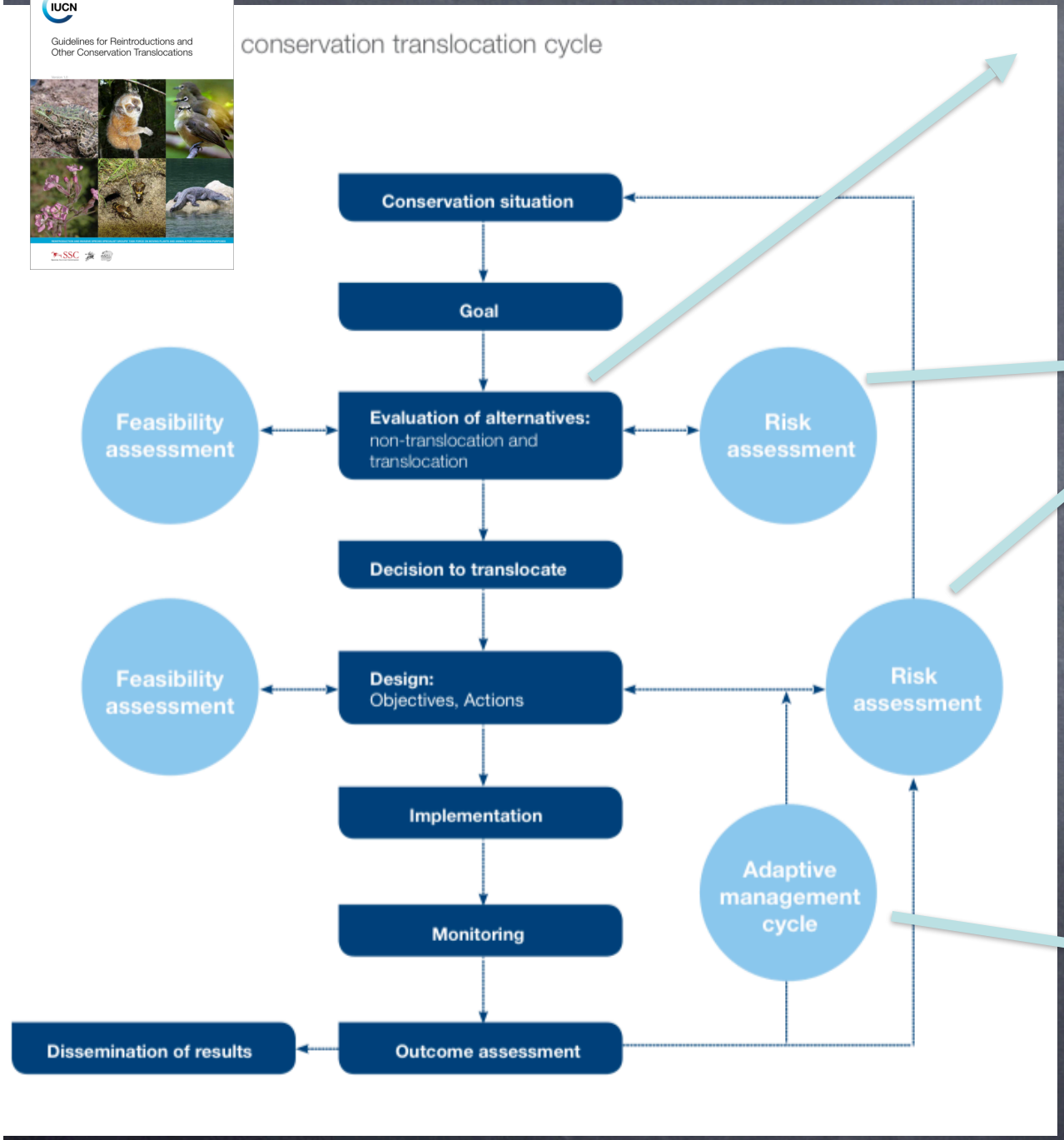


Deciding when translocation is an acceptable option

2. Species or populations that have small or declining populations or ranges, and/or high probabilities of extinction, will often be prime candidates. The metrics used by the

Risk assessment

6.6 Gene escape

Interspecific hybridisation

1. Translocation of a population into the close vicinity of a closely related species may result in inter-specific hybridisation which would not have occurred naturally. This is particularly

Monitoring

Adaptive management

Dissemination of results

What should be done if a man-induced hybrid of a threatened species appears in the wild?

Options:

- **Passive action**: monitoring what happens
- **Soft action**: remove the hybrid
- **Heavy action**: remove both the parents and the hybrid

Helosciadium bermejoi (= Apium bermejoi)

-Apiaceae of small dimensions, creeping, stoloniferous

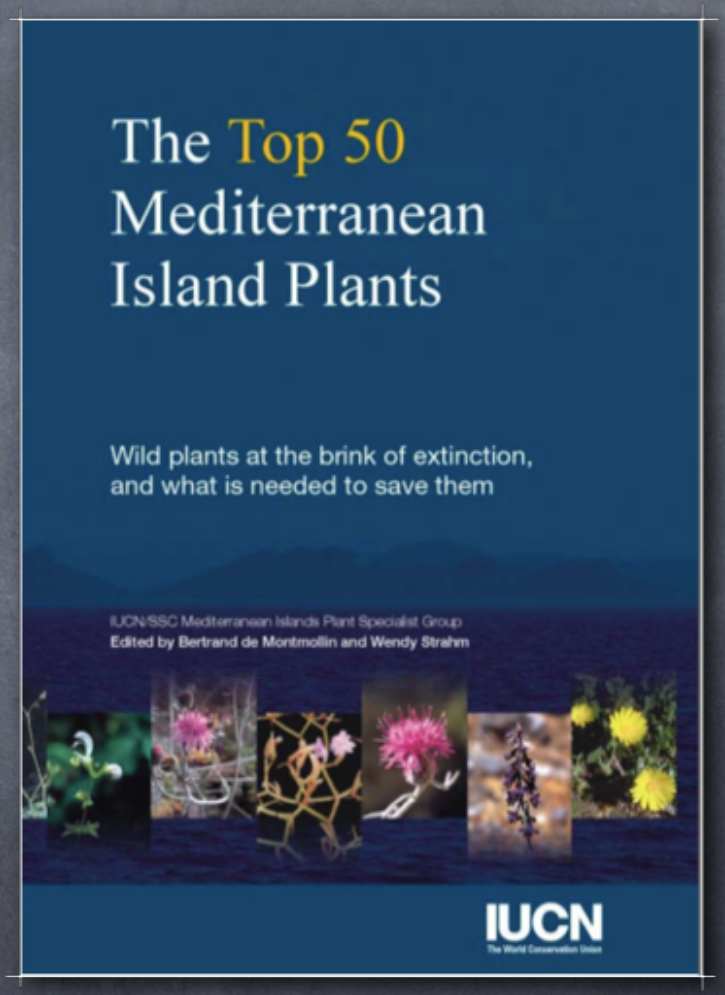
-Shape rosettes and lawns

-Simple umbels, with 5-15 flowers 2-3 mm

-Esquizocarps, adapted to geoautochory.

-Flowering in V-VI, fruiting VII-VIII.

-Hemicryptophyte / terophyte



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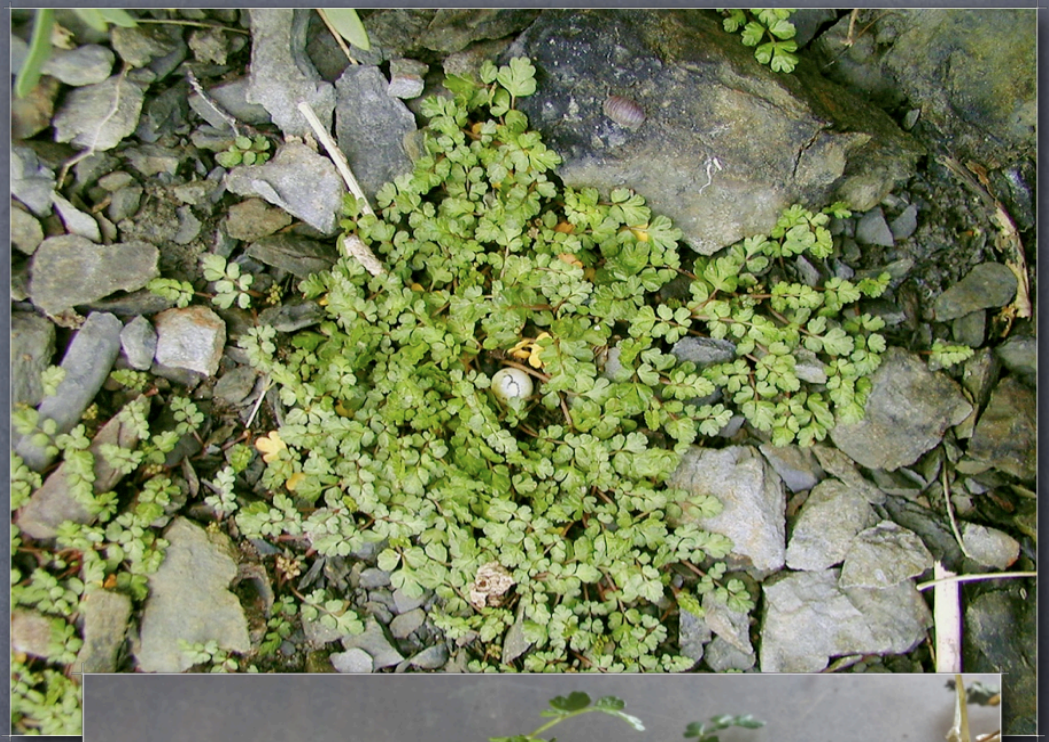

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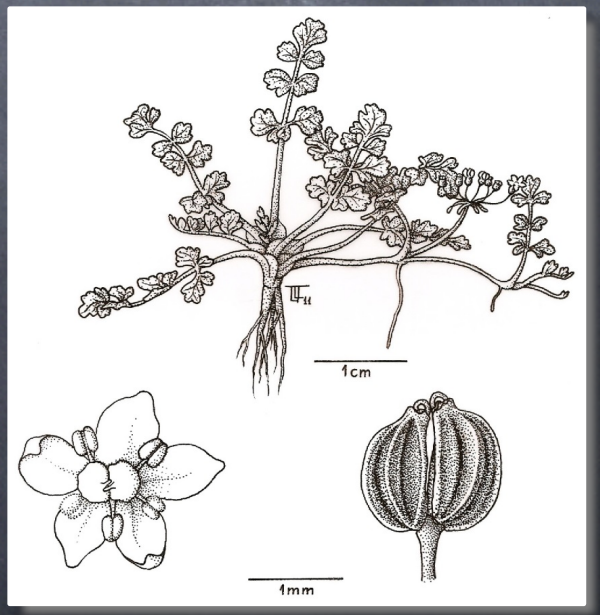


Distribution

A unique site on the northeast coast of Menorca

Fluctuating population, <100 individuals

A perfect candidate for an assisted colonization program

Conservation performances since 2004

- Seed bank
- Reinforcement the original population
- Assisted colonisations
- Monitoring
- Diffusion

Supported by

CONSELL INSULAR DE MENORCA

Govern de les Illes Balears
Conselleria de Medi Ambient, Agricultura i Pesca

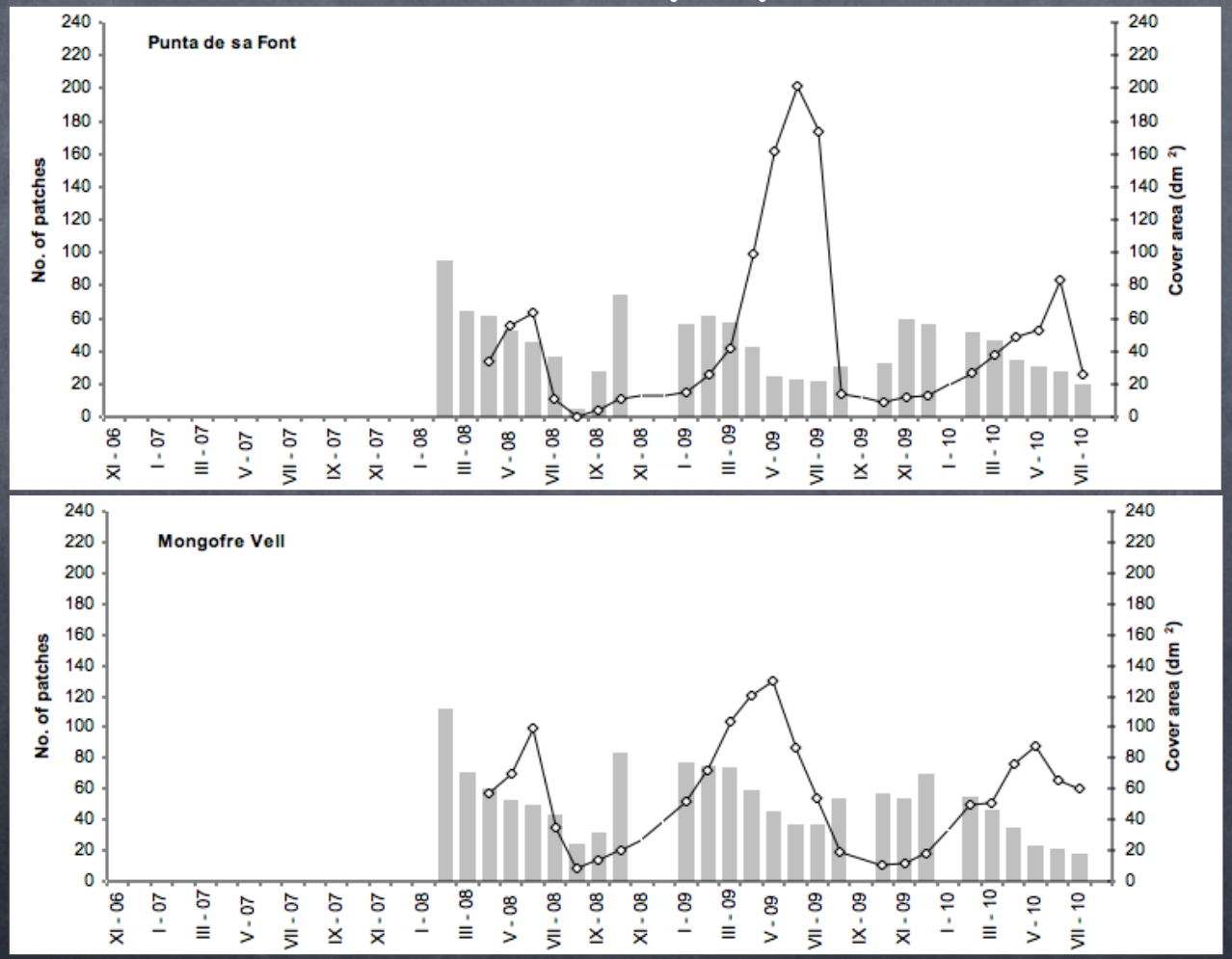
Supported by: MAVA FONDATION POUR LA NATURE

Assisted colonisations (2008)

Tipo de proyecto	Población	Código	Fecha	Tipo de propágulo	n.º individuos introducidos
Introducción	Punta de sa Font	PF	II - 2008	De semilla/ de esqueje	63 / 32
Introducción	Mongofre Vell	MV	II - 2008	De semilla/ de esqueje	72 / 39
Reforzamiento	Cap Negre	CNe	III - 2007	De semilla	16
Reforzamiento	Sa Cudia Nova	CNo	II - 2008	De semilla/ de esqueje	18 / 12
Reforzamiento	Sa Cudia Nova	CNo	V - 2010	De esqueje	107

Monitoring of the First two years (2008-2010)

Good cover and new germinations in the two new populations



Dissemination of results

Nordic Journal of Botany 30: 754–768, 2012
doi: 10.1111/j.1756-1051.2012.01437.x,
© 2012 The Authors. Nordic Journal of Botany © 2012 Nordic Society Oikos
Subject Editor: Åsa Lankinen. Accepted 25 May 2012

Reproductive biology and reproductive output assessment in natural and introduced subpopulations of *Apium bermejoi*, a 'Critically Endangered' endemic plant from Menorca (western Mediterranean)

Joana Cursach and Joan Rita

J. Cursach (joana.cursach@uib.es) and J. Rita, Dept de Biologia, Univ. de les Illes Balears, Ctra. Valldemossa km 7.5, ES-07122 Palma, Spain.

2012

Anales del Jardín Botánico de Madrid 70(1): 27-38, enero-junio 2013. ISSN: 0211-1322. doi: 10.3989/ajbm. 2303

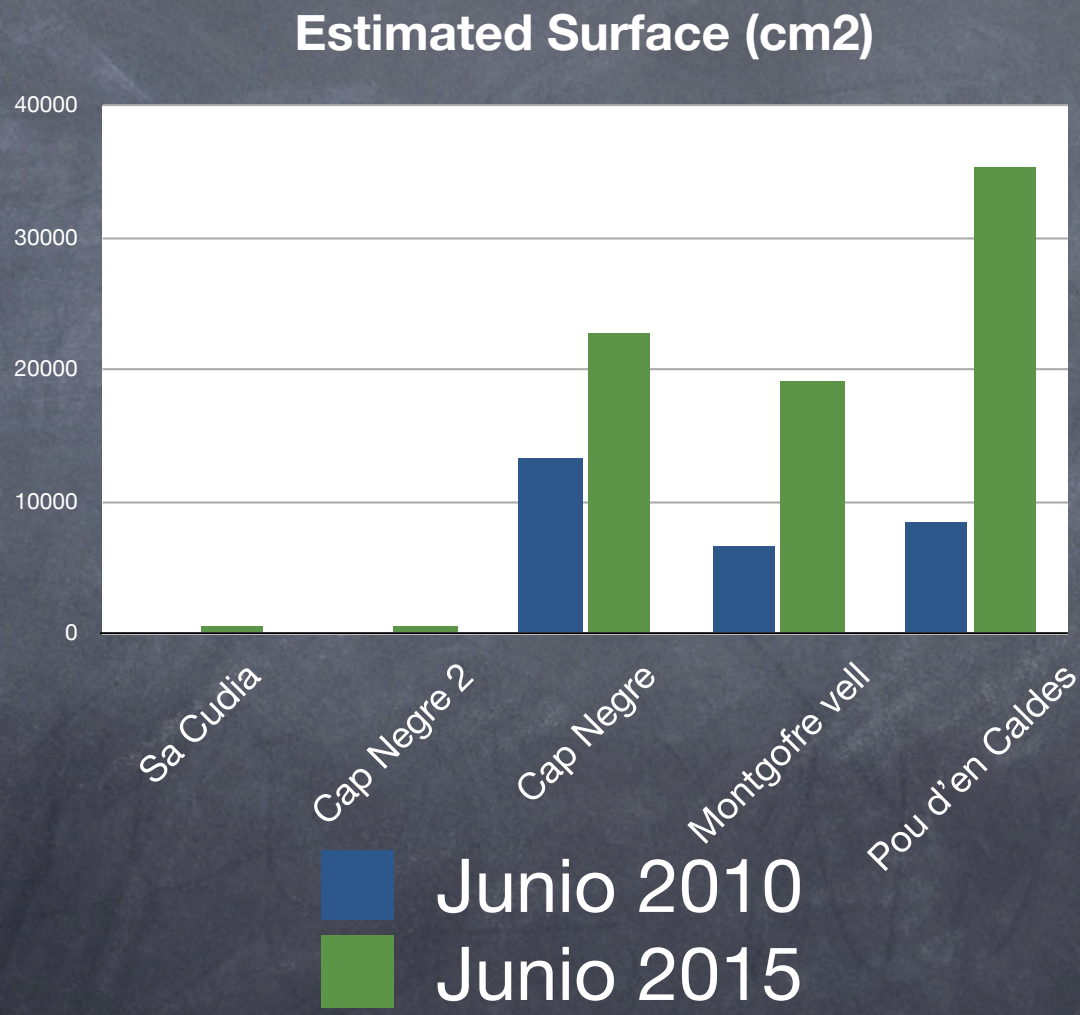
Creating new populations of *Apium bermejoi* (Apiaceae), a critically endangered endemic plant on Menorca (Balearic Islands)

Juan Rita* & Joana Cursach

Dep. de Biología, Universitat de les Illes Balears, ctra. Valldemossa km 7,5, E-07122 Palma de Mallorca, Spain
jrita@uib.es; joana.cursach@uib.es

2013

Assessment populations 2015: Excellent cover and germination



Assessment population 2015:

Unexpectedly H. bermejoi and H. nodiflorum physically coincided in a new locality (MV)

Assessment population 2015:

Unexpectedly H. bermejoi and H. nodiflorum physically coincided in a new locality (MV)

H. nodiflorum with dwarf and creeping forms and behaving as an amphibian, with flowers at ground level

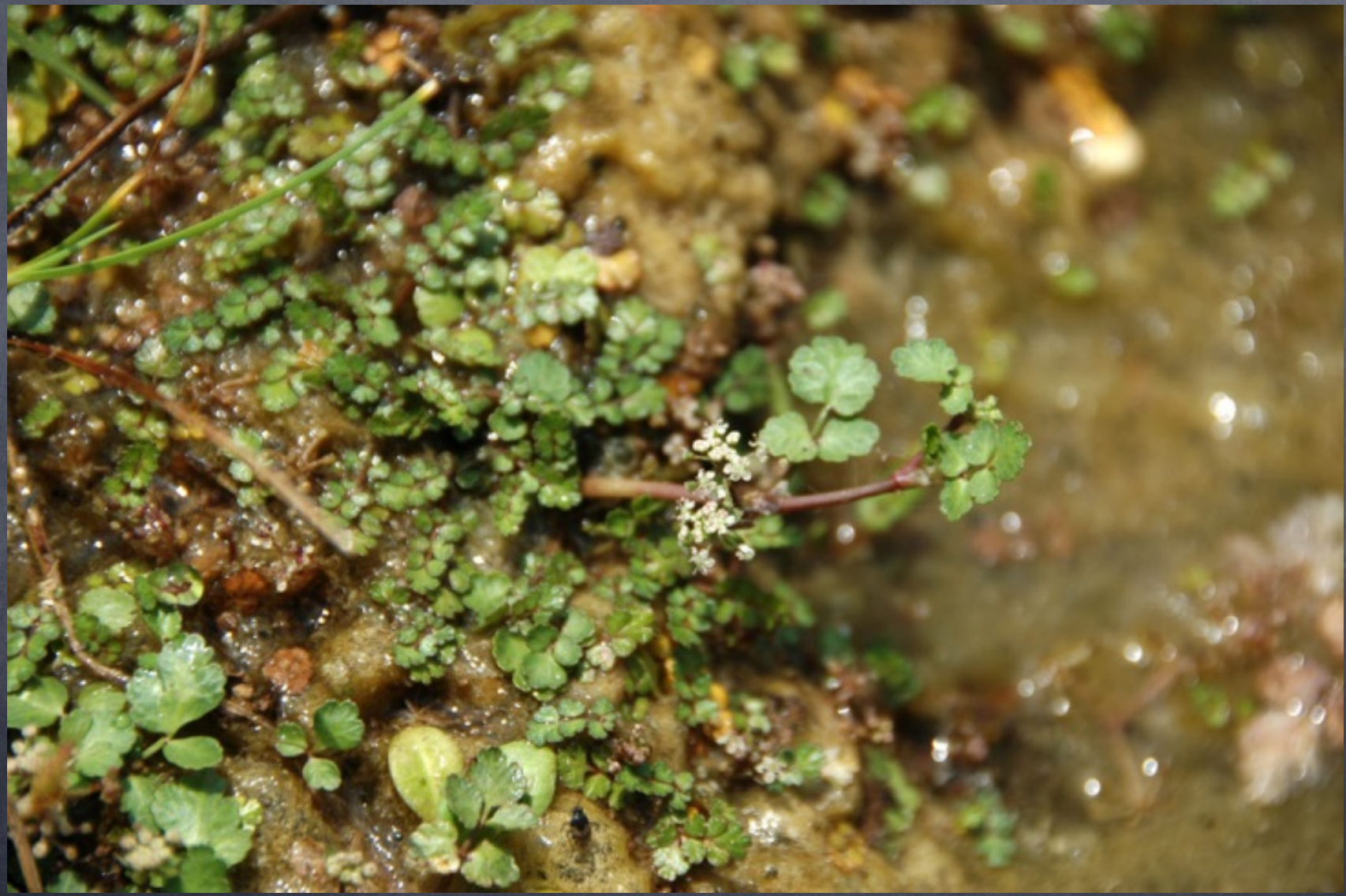
Assessment population 2015:

and... putative hybrids with H. nodiflorum were found

the new hybrids were more vigorous

Assessment population 2015:

and... putative hybrids with H. nodiflorum were found



the new hybrids were more vigorous

The putative hybrid presented an intermediate morphology between its two parents

H. nodiflorum (Mall)

H. nodiflorum (MV)

H x clandestinum

H. bermejoi

The putative hybrid presented an intermediate morphology between its two parents

H. bermejoi

H. x clandestinum

H. nodiflorum

Its hybrid origen was geneticaly confirmated

Ambiguous results in those positions of ITS sequences with different bases in the parent species

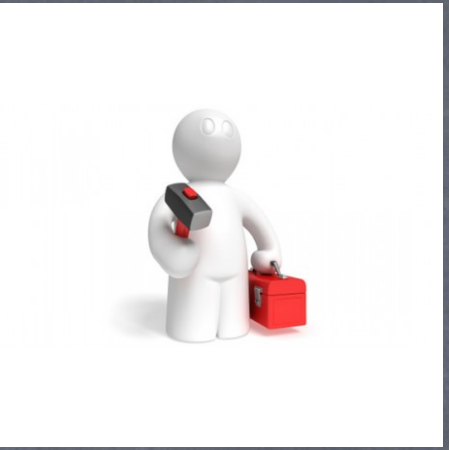
	nrDNA ITS Position				
	12	69	89	109	396
Helosciadium bermejoi	A	T	A	G	-
Helosciadium x clandestinum	W	K	R	G	A/-
Helosciadium nodiflorum	T	G	G	G	A

In the hybridization process both parents can act as pollen or ovule donor

Some hybrids had chloroplast DNA from H. bermejoi, but other from H. nodiflorum

	cpDNA					
	13	85,86	177	418	429	509
Helosciadium bermejoi	C	AT	T	C	G	C
Helosciadium x clandestinum	C	AT	T	C	G	C
Helosciadium x clandestinum	C	-	A	T	G	C
Helosciadium nodiflorum	C	-	A	T	G	C

What we did?



- Consultation with the environmental authority
- It was considered that the risk was unacceptable
- It was considered that it could not be wait for a molecular confirmation

What we did?

It was decided to proceed to:

- Remove the putative hybrids
- Remove the introduced population of H. bermejoi
- Remove all the nearby H. nodiflorum
- Cut all the inflorescences of the surrounding H. nodiflorum
- Remove from the site all the plant material and soil
- Monitoring during next years
- Maintain some hybrids ex situ and isolates

Removing introduced population of Montgofre Vell

June 2015

Removing introduced population of Montgofre Vell

Dissemination of results

Flora Montiberica 63: 130-136 (V-2016). ISSN: 1138-5952, edic. digital: 1988-799X

HELOSCIADIUM × *CLANDESTINUM* UN NUEVO HÍBRIDO APARECIDO EN MENORCA (ISLAS BALEARES)

Juan RITA LARRUCEA, Miquel CAPÓ SERVERA & Joana CURSACH SEGUÍ
[1]Dept. de Biologia, Universitat de les Illes Balears. 07122-Palma. jrita@uib.es

2016

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Hybridization processes in an introduced subpopulation of an endangered plant: Management strategies to guarantee the conservation of *Helosciadium bermejoi* (Apiaceae)

Juan Rita[a,*], Miquel Capó[a], Eva Moragues[b], Josefina Bota[a], Joana Cursach[a]

2018

Wetlands are very dynamics, so long term monitoring and adaptive management are imperative

2008

Punta de sa Font

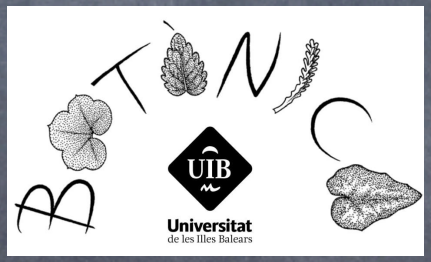
2015

Learned lessons

- Monitoring during long periods of time is imperative for any traslocation
- The introductions have a real risk, mainly in wetlands for their extreme dynamism
- Ex situ populations have a real risk too ¡attention the botanical gardens!
- Collaboration between scientist and managers is fundamental

Thanks for your attention

Supported by



With the collaboration