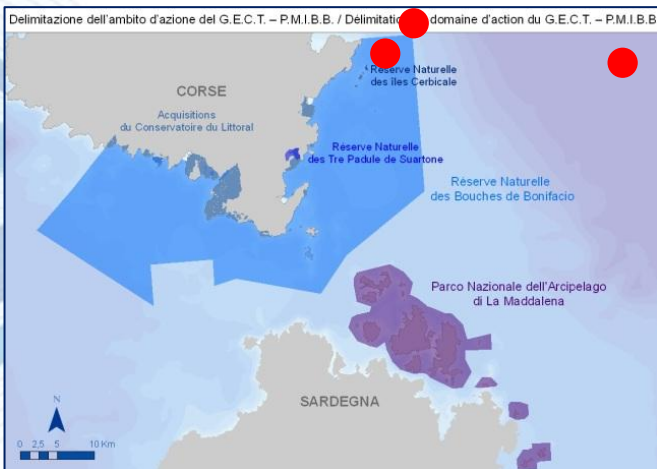
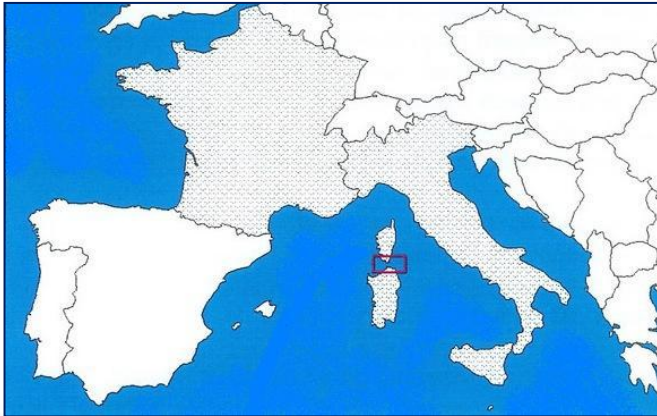


Knowledge of the flora and study of the vegetation dynamics on marine islets



NOSTRA Bonifacio - 4 and 5 June, 2014

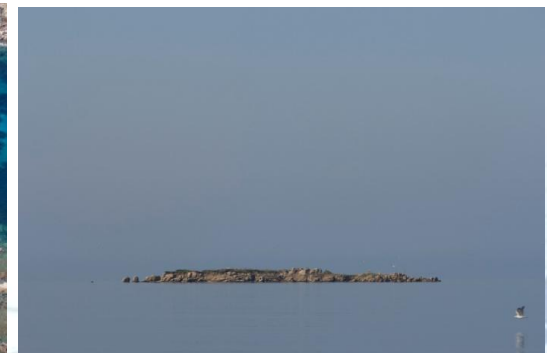
Localisation of the area



Localisation of the area



- Farina Island
- Forana Island
 - Cerbicale
 - Maestro Maria
 - Piana
 - Pietricaggiosa Islands
- Vacca Rock
- Toro Islets
- Folaca Island
- Capu d'Acciaju Islets
- Porraccia Island
- Ratino Island
- Piana Island
- In Vachetta
- Lavezzi Islands
- Cala Sciumara Islets
- Fazzio Island
- Tonnara Islands
- Bruzzi Islands
- Moines Islets



Islet Name	Surface area (m ²)	Surface area (ha)	N° of taxa
Lavezzu	729,370	72.9	226
Piana	64,500	6.5	214
Pietricaggiosa	45,800	4.6	96
Maestro Maria	28,200	2.8	88
Fazzio (small islet)	3,620	0.3	48
Fazzio (large islet)	12,130	1.2	41
Bruzzi	11,550	1.2	24
Grand Toro	16,200	1.6	15
Petit Toro	5,100	0.5	10
Folacchedda	990	0.01	7

Anthyllis barba-jovis



Nananthea perpusilla



Ipomea sagittata

Protected
Endemic
Limited to the area **Rare**



Helicodicerus muscivorus



Asplenium obovatum



Limonium lambinonii



Mesembryanthemum crystallinum

Monitoring a heritage species: *Silene velutina*

Corsica: 26 stations

14 micro island stations
12 coastal stations

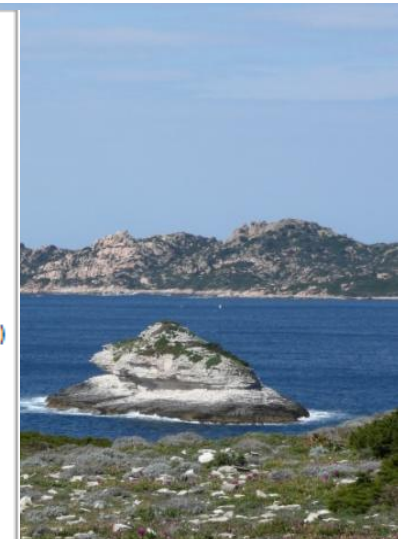
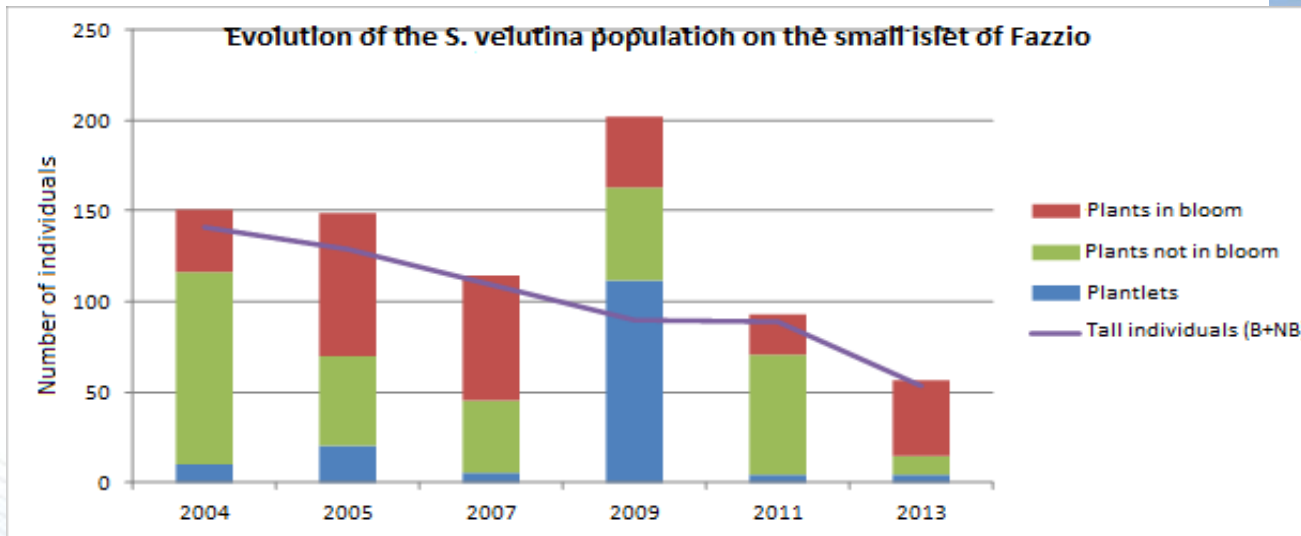
E.G.C.T.-P.M.I.B.B.: 26 stations

13 Corsican stations
13 Sardinian stations

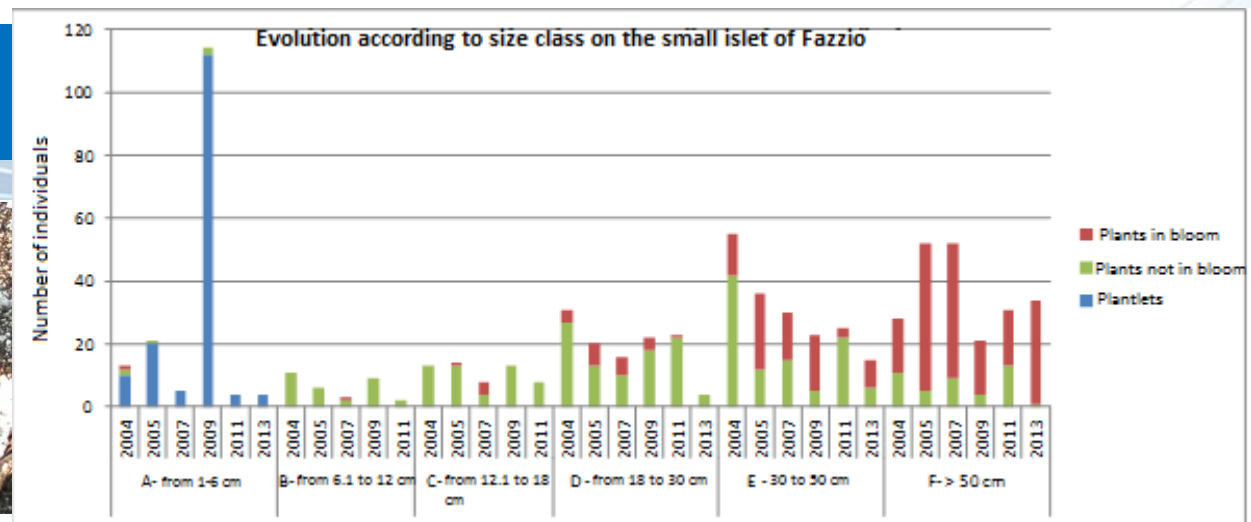
Sardinia: 13 stations

13 micro island stations

Monitoring a heritage species: *Silene velutina*



Decline in the population



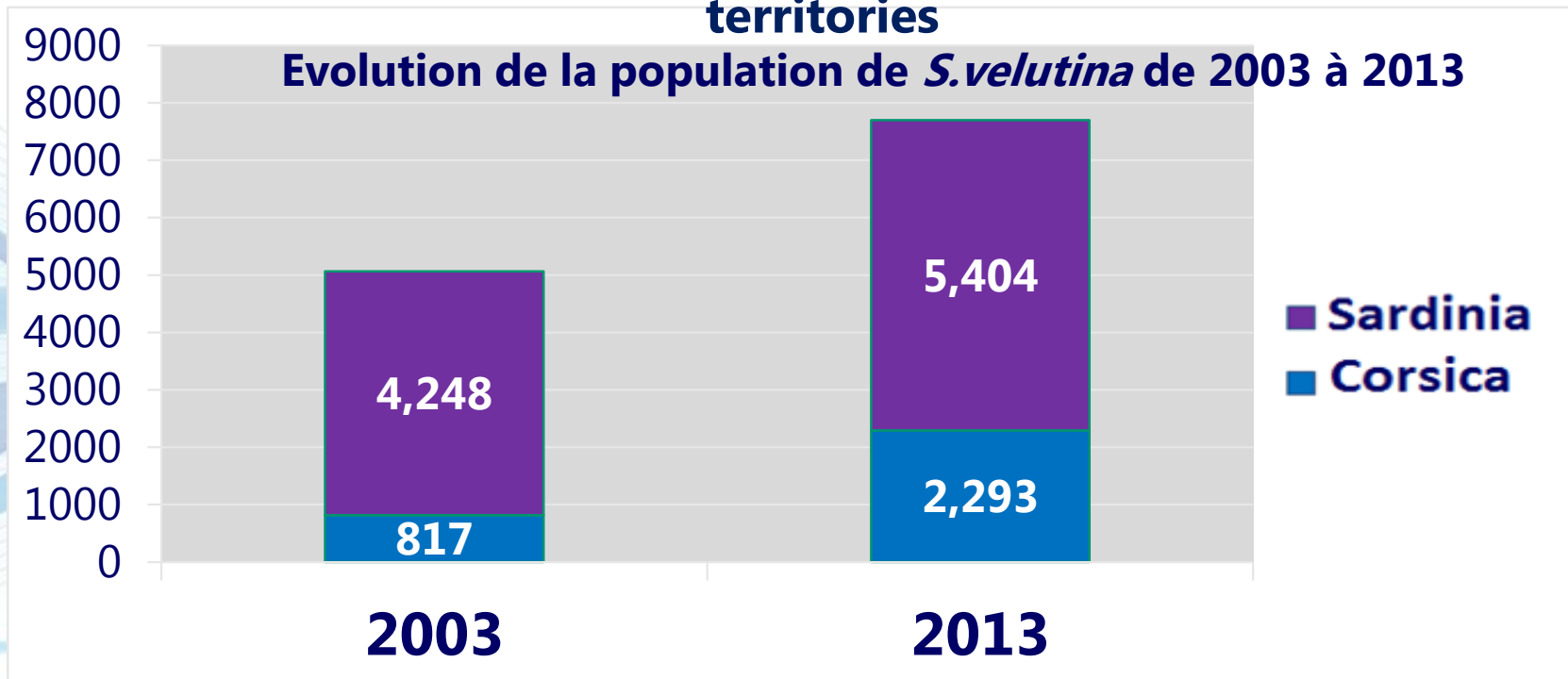
Population in 2013:

2,293 individuals in Corsica

5,404 individuals in Sardinia

7,697 individuals
In the EGCT-PMIBB territory

Monitoring of the population for more than 10 years in the territories



Changes in numbers - 4 trends:

drastic decline (Fazzio, Folaca)

decline (Ecueils d'Acciaju)

stability (Folaca, Folachedda and Cala Sciumara)

progression (Tamaricciu, Toro Islets, Silène and St Roch Islets)



Threats:

Presence of **breeding gulls**

Presence of *Lavatera arborea*

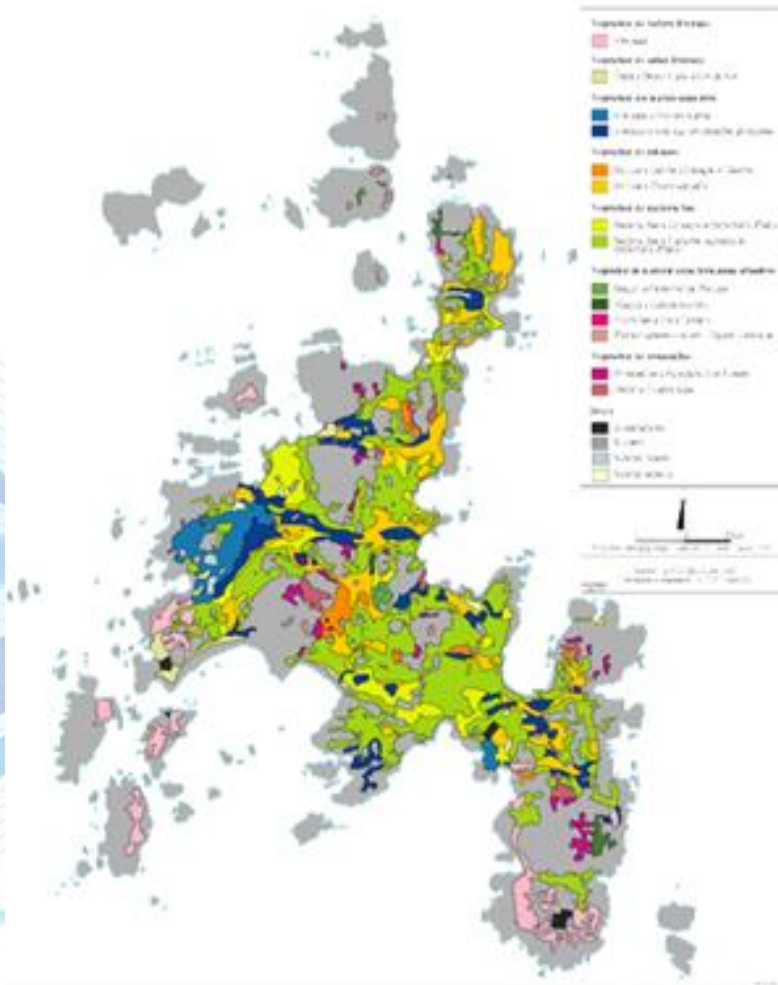
Presence of **black rats**

Trampling

Substrate **Erosion**

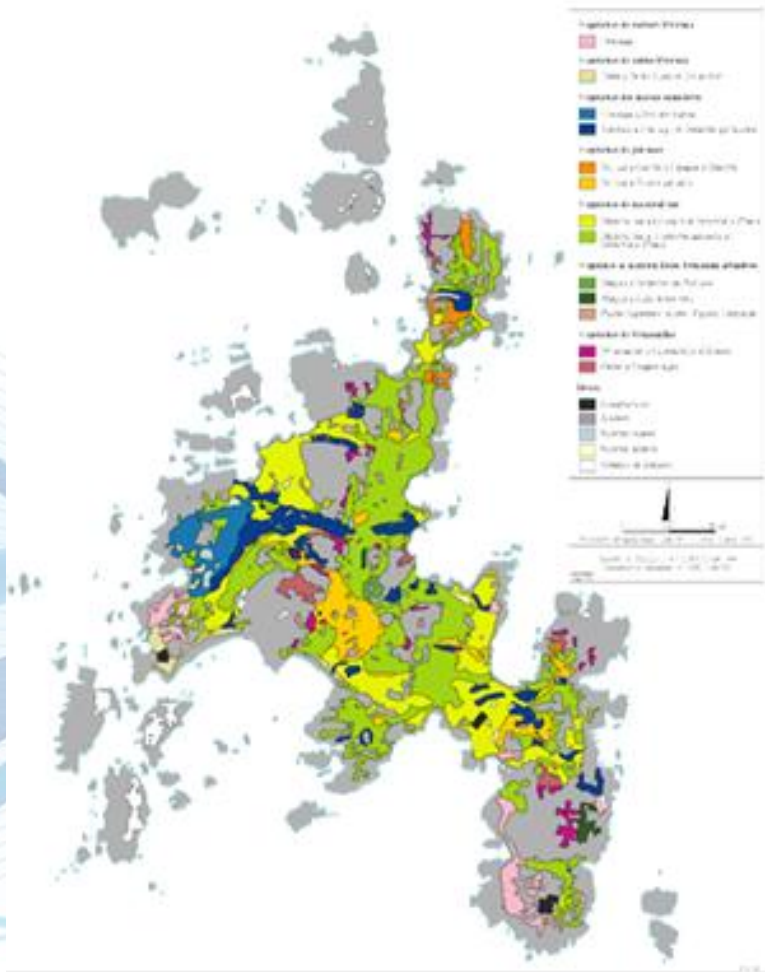
Study of vegetation dynamics on Lavezzu Island since 1982

VEGETATION SERIES
LAVEZZU ISLAND AND NEARBY ISLETS- SOUTHERN CORSICA
SPRING 1982



DUBRAY (1982)

VEGETATION SERIES LAVEZZU ISLAND AND NEARBY ISLETS- SOUTHERN CORSICA SPRING 1994

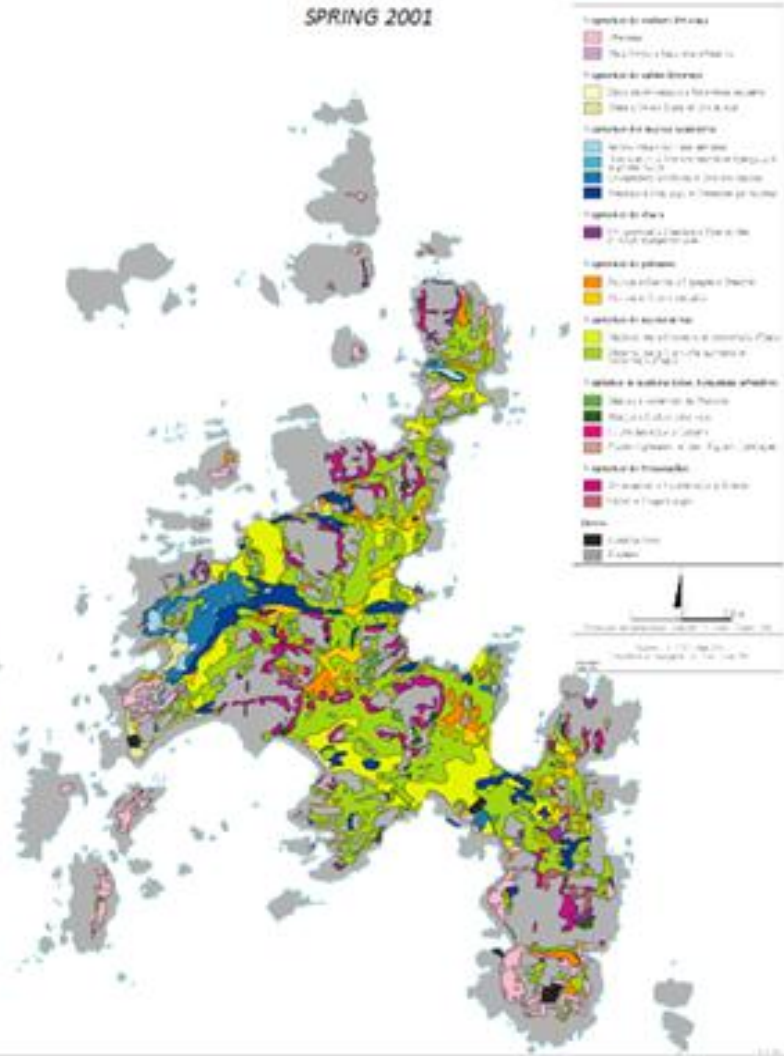


Study of vegetation dynamics on Lavezzi Island since 1982

DUBRAY

CHALLIOU and
LORiot(1994)

VEGETATION SERIES LAVEZZU ISLAND AND NEARBY ISLETS- SOUTHERN CORSICA SPRING 2001



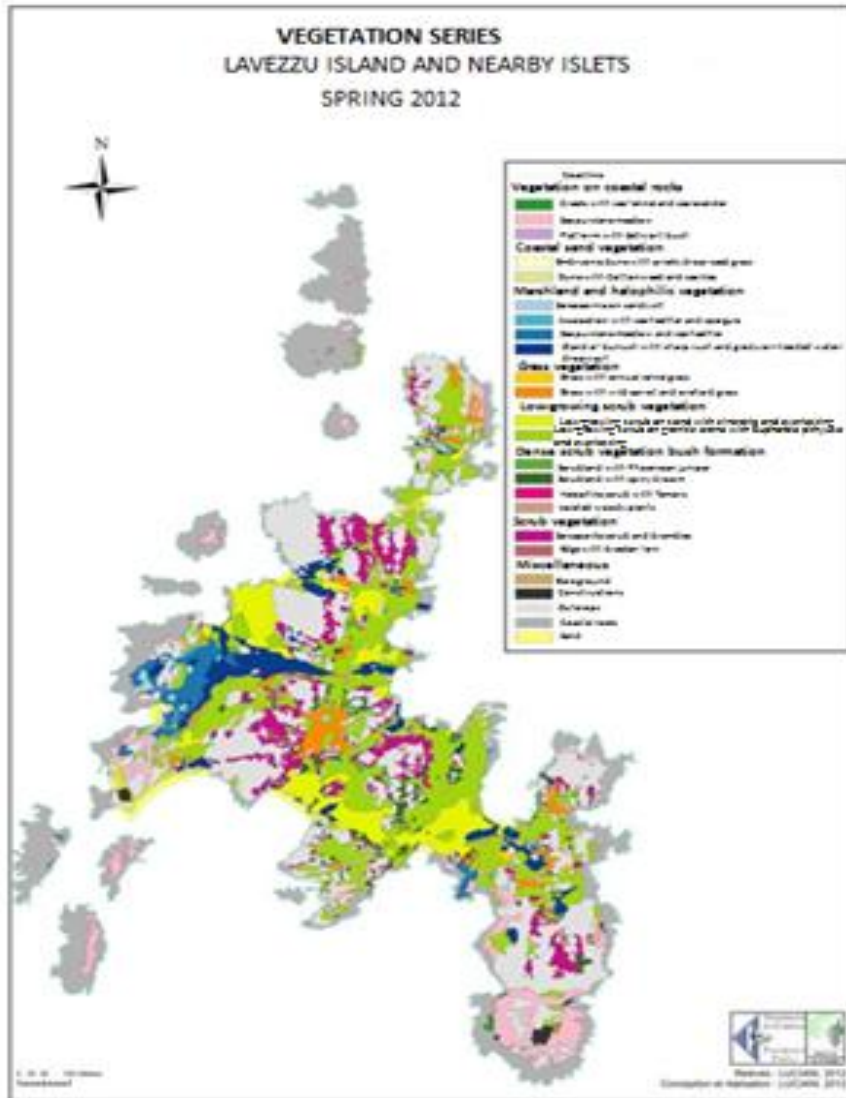
Study of vegetation dynamics on Lavezzi Island since 1982

DUBRAY (1982)

CHALLIOU and LORIOT
(1994)

COIC (2001)

Study of vegetation dynamics on Lavezzu Island since 1982



DUBRAY (1982)

CHALLIOU and LORIOT
(1994)

COIC (2001)

LUCIANI(2012)



30 year monitoring of the island's vegetation

Phytocoenotic inventory and identification of vegetation series

Ground prospecting: creation of the vegetation unit map

Each unit is:

- Attached to a **vegetation series**
- Characterised by a **dynamic sequence**
- Defined by one or several **dominant or characteristic species**

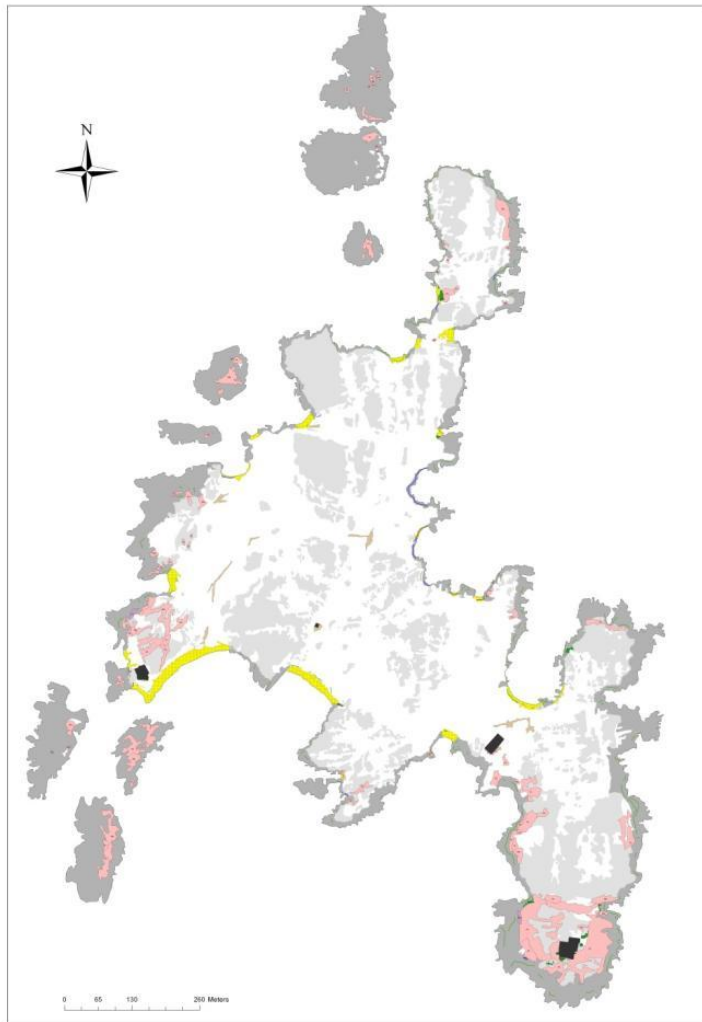
Entry of data into a GIS

A **dynamic series** assembles various sequences of an ecological succession, that is the whole made up of an initial, stable vegetal grouping, in harmony with the environmental conditions, the groupings demonstrating progressive dynamics and those which derive from regressive dynamics (OZENDA,1982).

Dynamic Sequences:

- Sequence 1 – Initial grouping
- Sequence 2 – Substratum or superimposition grouping
- Sequence 3 – Grouping of total substitution
- Sequence 4 – Bedrock exposed

Cartography 2012: Vegetation series and dominant species



Coastal rocks

Cartography 2012: Vegetation series and dominant species



Vegetation linéaire

- Lichén maritime
- Algues maritimes
- Vég. littorale
- Sédiments protégés

Vegetation des rochers littoraux

Planchettes à corallites maritimes et arborescentes

- Lichén maritime

Climacales

- 11M: Sédiments littoraux
- 11A: Sédiments littoraux
- 11B: Sédiments littoraux
- 11C: Sédiments littoraux
- 11D: Sédiments littoraux
- 11E: Sédiments littoraux
- 11F: Sédiments littoraux
- 11G: Sédiments littoraux
- 11H: Sédiments littoraux
- 11I: Sédiments littoraux
- 11J: Sédiments littoraux
- 11K: Sédiments littoraux
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- 11P: Sédiments littoraux
- 11Q: Sédiments littoraux
- 11R: Sédiments littoraux
- 11S: Sédiments littoraux
- 11T: Sédiments littoraux
- 11U: Sédiments littoraux
- 11V: Sédiments littoraux
- 11W: Sédiments littoraux
- 11X: Sédiments littoraux
- 11Y: Sédiments littoraux
- 11Z: Sédiments littoraux

Planchettes à corallites arborescentes

- 11A: Sédiments littoraux

Vegetation des sables littoraux

Dunes embryonnaires à végétation pionnière

- 11A: Sédiments littoraux
- 11B: Sédiments littoraux
- 11C: Sédiments littoraux
- 11D: Sédiments littoraux
- 11E: Sédiments littoraux
- 11F: Sédiments littoraux
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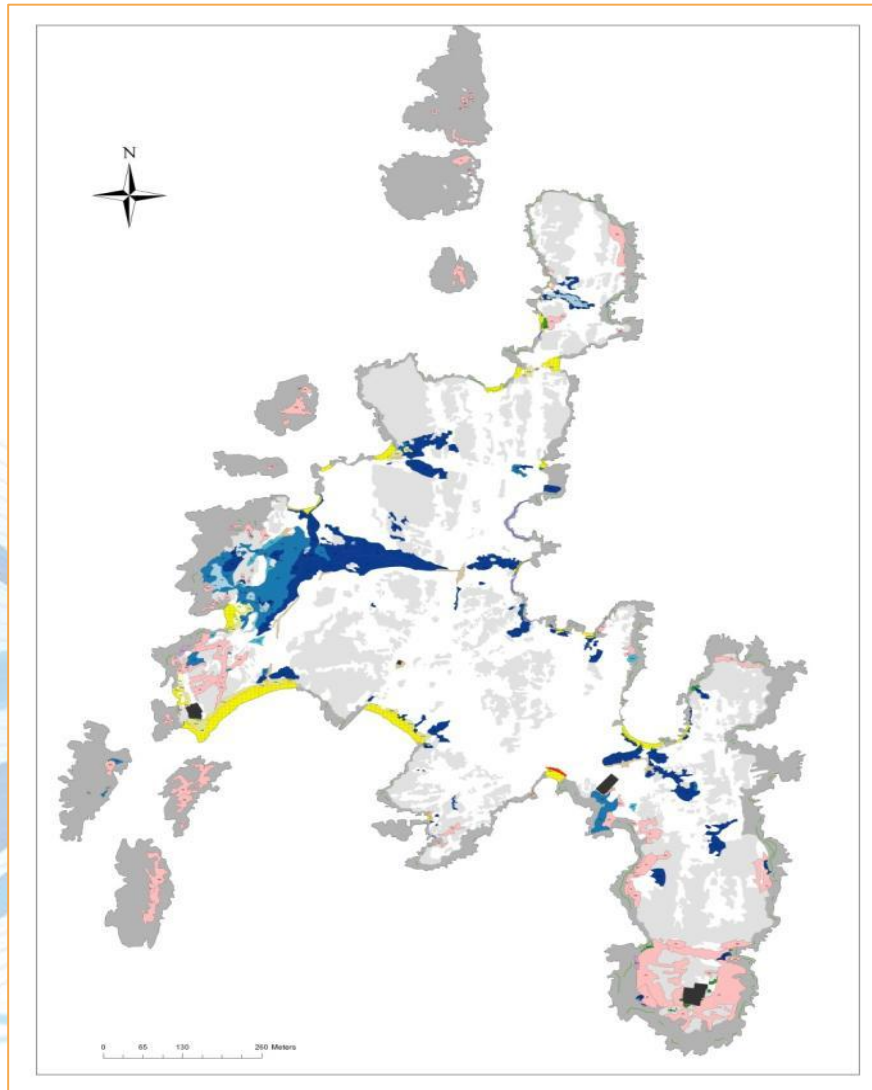
Dunes à dunes blanches et de mer

- 11A: Sédiments littoraux

Autres dunes

Coastal rocks
Coastal sand

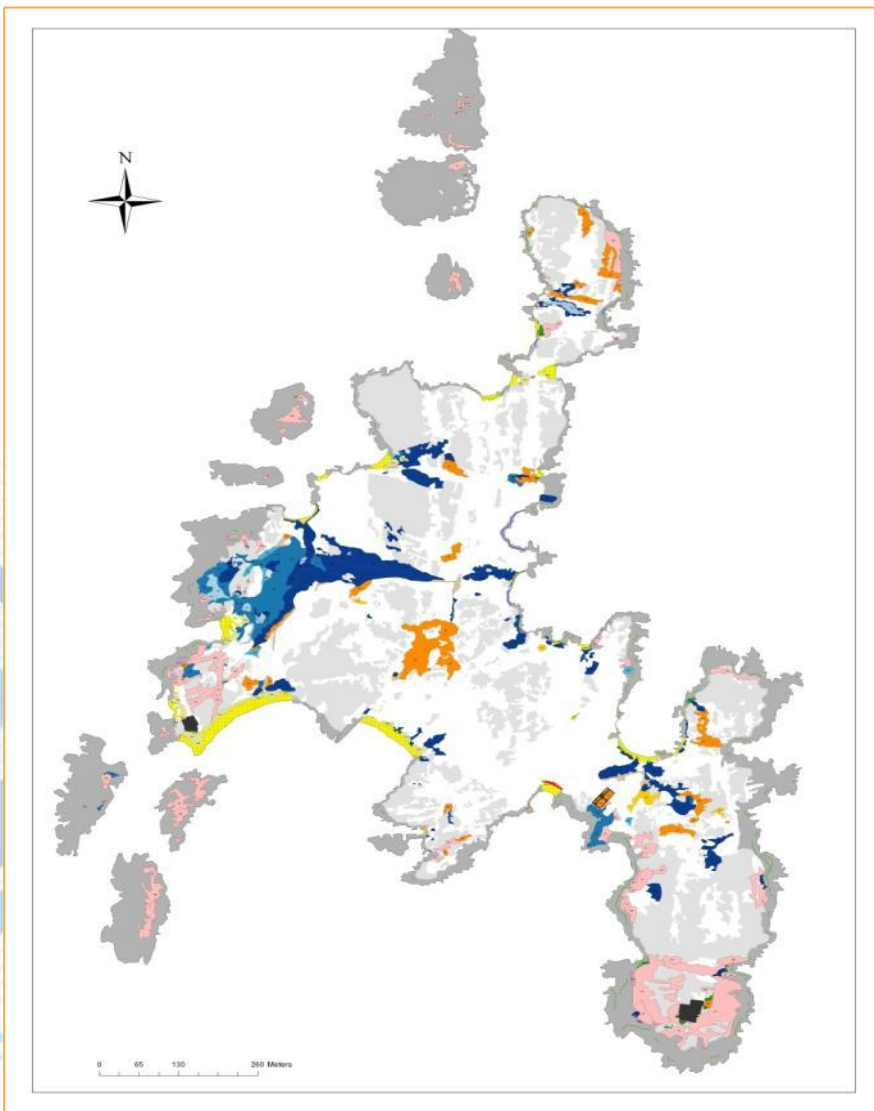
Cartography 2012: Vegetation series and dominant species



Vegetation linéaire	
010	Linéaire maritime
020	Épave maritime
030	Voie littorale
040	Succédané progressif
Vegetation des rochers littoraux	
Pierres à corail marines et ostrées	
100	Linéaire maritime
Olivéales	
110	Linéaire maritime
120	Linéaire maritime
130	Linéaire maritime
140	Linéaire maritime
150	Linéaire maritime
160	Linéaire maritime
170	Linéaire maritime
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Coastal rocks
Coastal sand
Brackish and
halophilic marshland

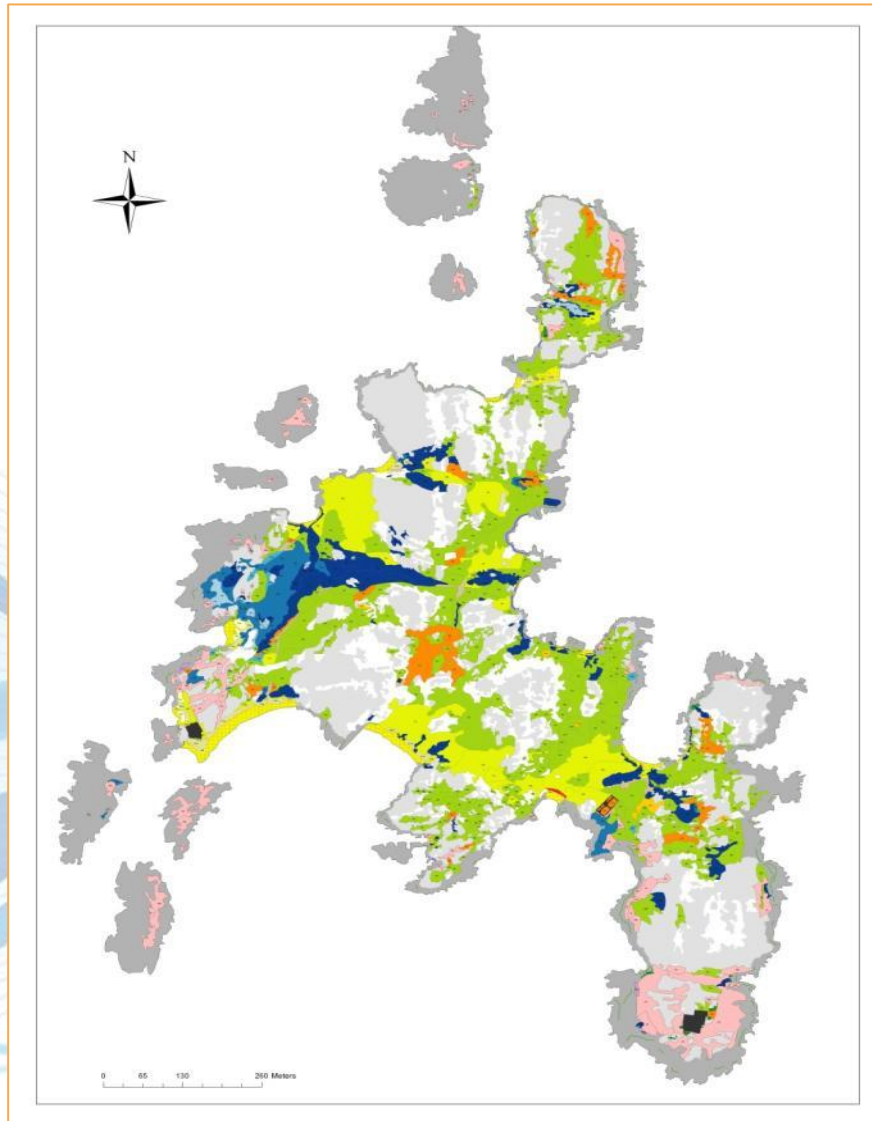
Cartography 2012: Vegetation series and dominant species



Vegetation linéaire	
—	Colonne rochers
—	Épave rochers
—	Roche calcaire
—	Succédané propre
Vegetation des rochers littoraux	
Pierres à corail marines et vertes	
■	Colonne rochers
Climacale	
■	136A: Laurus rosalia
■	136B: Sesuvium portuense
■	136C: Sesuvium portuense
■	136D: Sesuvium portuense
■	136E: Sesuvium portuense
■	136F: Sesuvium portuense
■	136G: Sesuvium portuense
■	136H: Sesuvium portuense
■	136I: Sesuvium portuense
■	136J: Sesuvium portuense
■	136K: Sesuvium portuense
■	136L: Sesuvium portuense
■	136M: Sesuvium portuense
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■	136R: Sesuvium portuense
■	136S: Sesuvium portuense
■	136T: Sesuvium portuense
■	136U: Sesuvium portuense
■	136V: Sesuvium portuense
■	136W: Sesuvium portuense
■	136X: Sesuvium portuense
■	136Y: Sesuvium portuense
■	136Z: Sesuvium portuense
Vegetation des sables littoraux	
Dune embryonnaire à sporopode rampant	
■	137A: Sesuvium portuense
■	137B: Sesuvium portuense
■	137C: Sesuvium portuense
■	137D: Sesuvium portuense
■	137E: Sesuvium portuense
■	137F: Sesuvium portuense
■	137G: Sesuvium portuense
■	137H: Sesuvium portuense
■	137I: Sesuvium portuense
■	137J: Sesuvium portuense
■	137K: Sesuvium portuense
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■	137R: Sesuvium portuense
■	137S: Sesuvium portuense
■	137T: Sesuvium portuense
■	137U: Sesuvium portuense
■	137V: Sesuvium portuense
■	137W: Sesuvium portuense
■	137X: Sesuvium portuense
■	137Y: Sesuvium portuense
■	137Z: Sesuvium portuense
Vegetation de marais salins et halophiles	
Association à bruyère marine et sporopode à grosse racine	
■	138A: Sesuvium portuense
■	138B: Sesuvium portuense
■	138C: Sesuvium portuense
■	138D: Sesuvium portuense
■	138E: Sesuvium portuense
■	138F: Sesuvium portuense
■	138G: Sesuvium portuense
■	138H: Sesuvium portuense
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■	138J: Sesuvium portuense
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■	138L: Sesuvium portuense
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■	138Q: Sesuvium portuense
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■	138V: Sesuvium portuense
■	138W: Sesuvium portuense
■	138X: Sesuvium portuense
■	138Y: Sesuvium portuense
■	138Z: Sesuvium portuense
Vegetation de pelouses	
Pelouse à carotte d'Espagne et destyle	
■	139A: Sesuvium portuense
■	139B: Sesuvium portuense
■	139C: Sesuvium portuense
■	139D: Sesuvium portuense
■	139E: Sesuvium portuense
■	139F: Sesuvium portuense
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■	139X: Sesuvium portuense
■	139Y: Sesuvium portuense
■	139Z: Sesuvium portuense

Coastal rocks
Coastal sand
Brackish and halophilic marshland
Grass

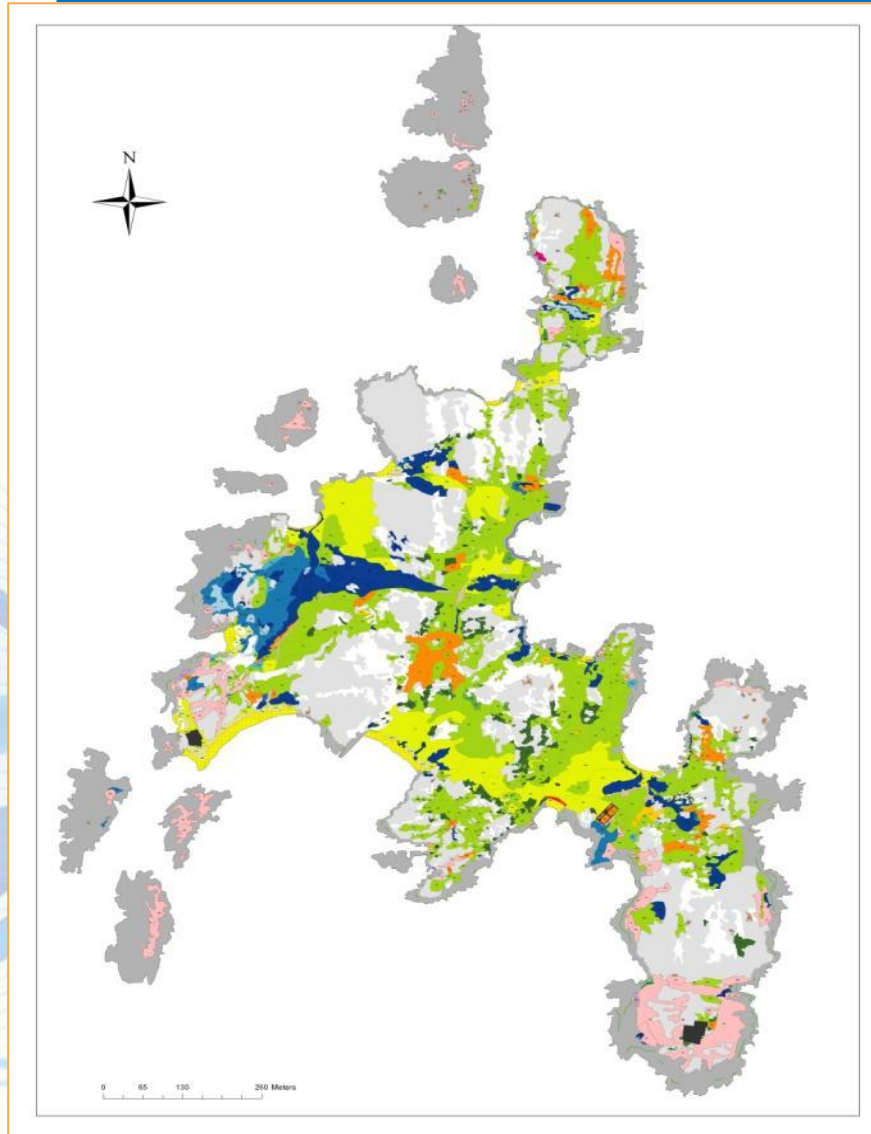
Cartography 2012: Vegetation series and dominant species



Vegetation linéaire	
010	Linéaire maritime
020	Épave maritime
030	Voie côtière
040	Sécheresse côtière
Vegetation des rochers littoraux	
Pierres à corail marines et vertes	
100	Linéaire maritime
Clonales	
110	Linéaire maritime
120	Linéaire maritime
130	Linéaire maritime
140	Linéaire maritime
150	Linéaire maritime
160	Linéaire maritime
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Coastal rocks
 Coastal sand
 Brackish and halophilic marshland
 Grass
 Low-growing scrub

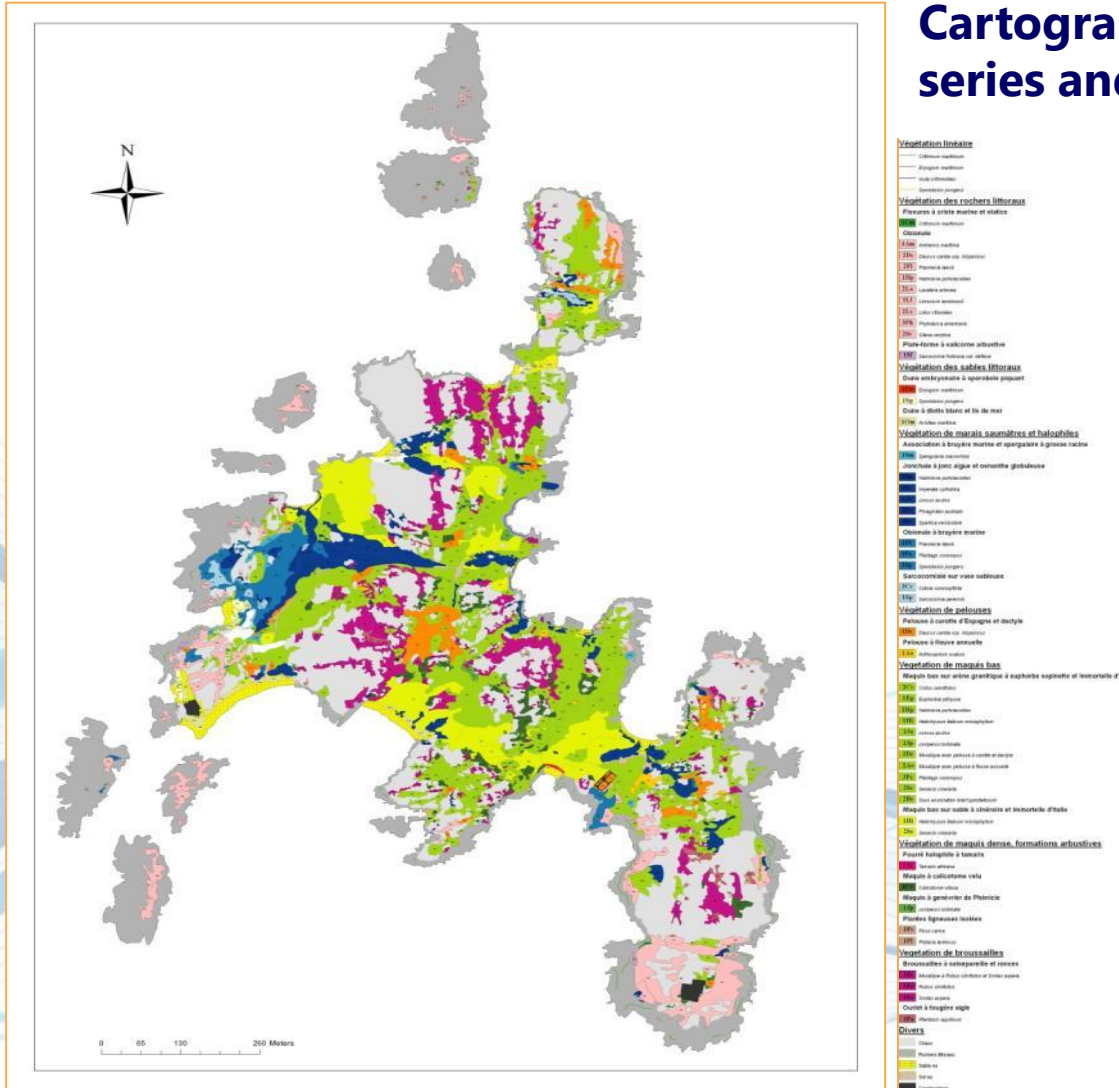
Cartography 2012: Vegetation series and dominant species



Vegetation linéaire	
010	Linéaire maritime
020	Épave maritime
030	Linéaire littoral
040	Linéaire d'origine
Vegetation des rochers littoraux	
Plancher à corail marins et sautés	
100	Linéaire maritime
Climacale	
110	Linéaire maritime
120	Linéaire maritime
130	Linéaire maritime
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150	Linéaire maritime
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970	Linéaire maritime
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990	Linéaire maritime

Coastal rocks
 Coastal sand
 Brackish and halophilic marshland
 Grass
 Low-growing scrub
 Dense scrub, bush formations

Cartography 2012: Vegetation series and dominant species



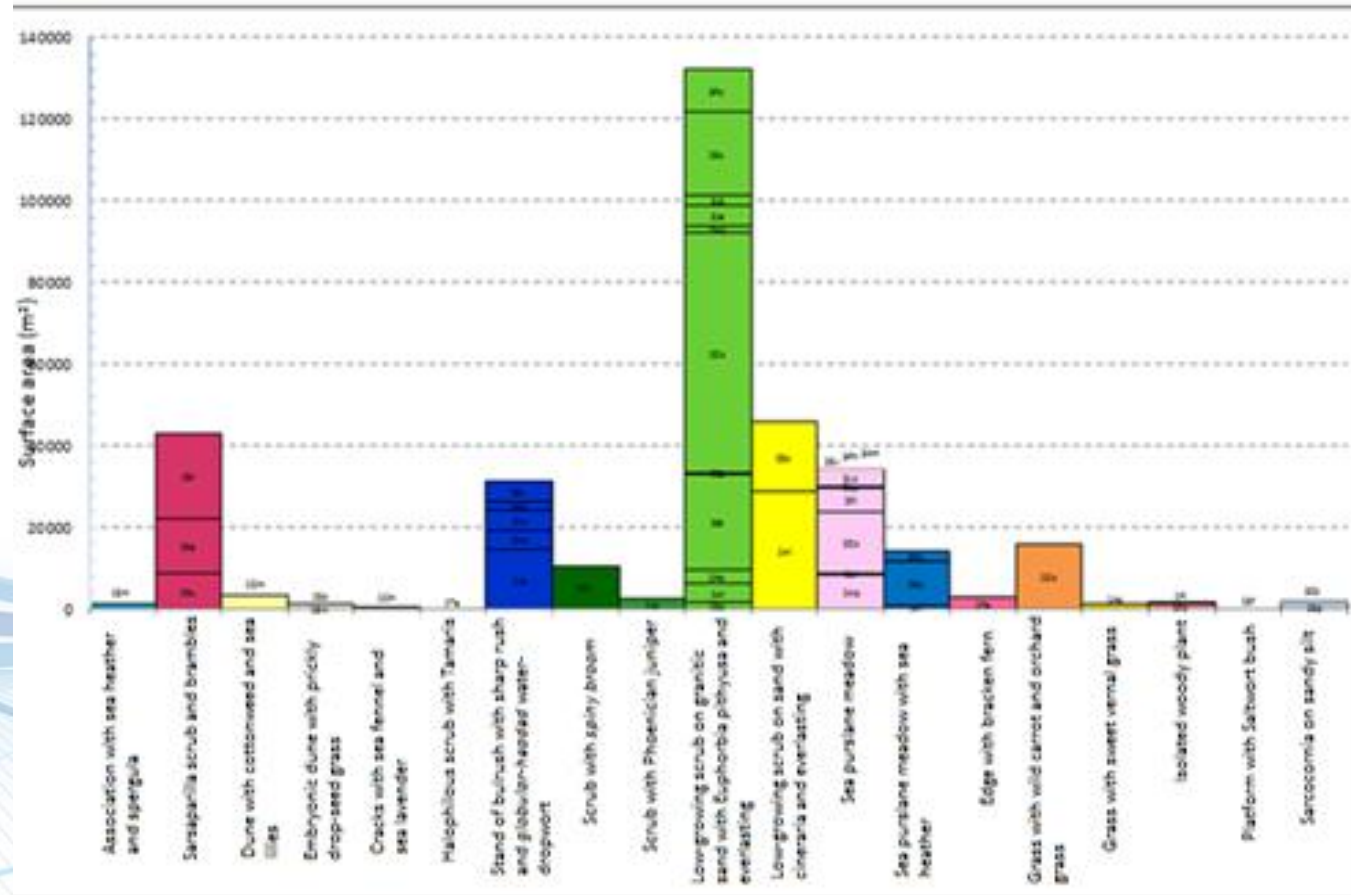
Coastal rocks
 Coastal sand
 Brackish and halophilic marshland
 Grass
 Low-growing scrub
 Dense scrub, bush formations
 Scrubland

Surface analysis:

Strong dominance of low-growing scrub (51.43%)

Significant Proportion of scrubland (12.37%)

11 vegetation series representing less than 1% each



Diachronic analysis

Regression:

Grass with sweet vernal grass

Dunes with Cottonweed and sea lily

Progression:

Grass with wild carrot and orchard grass

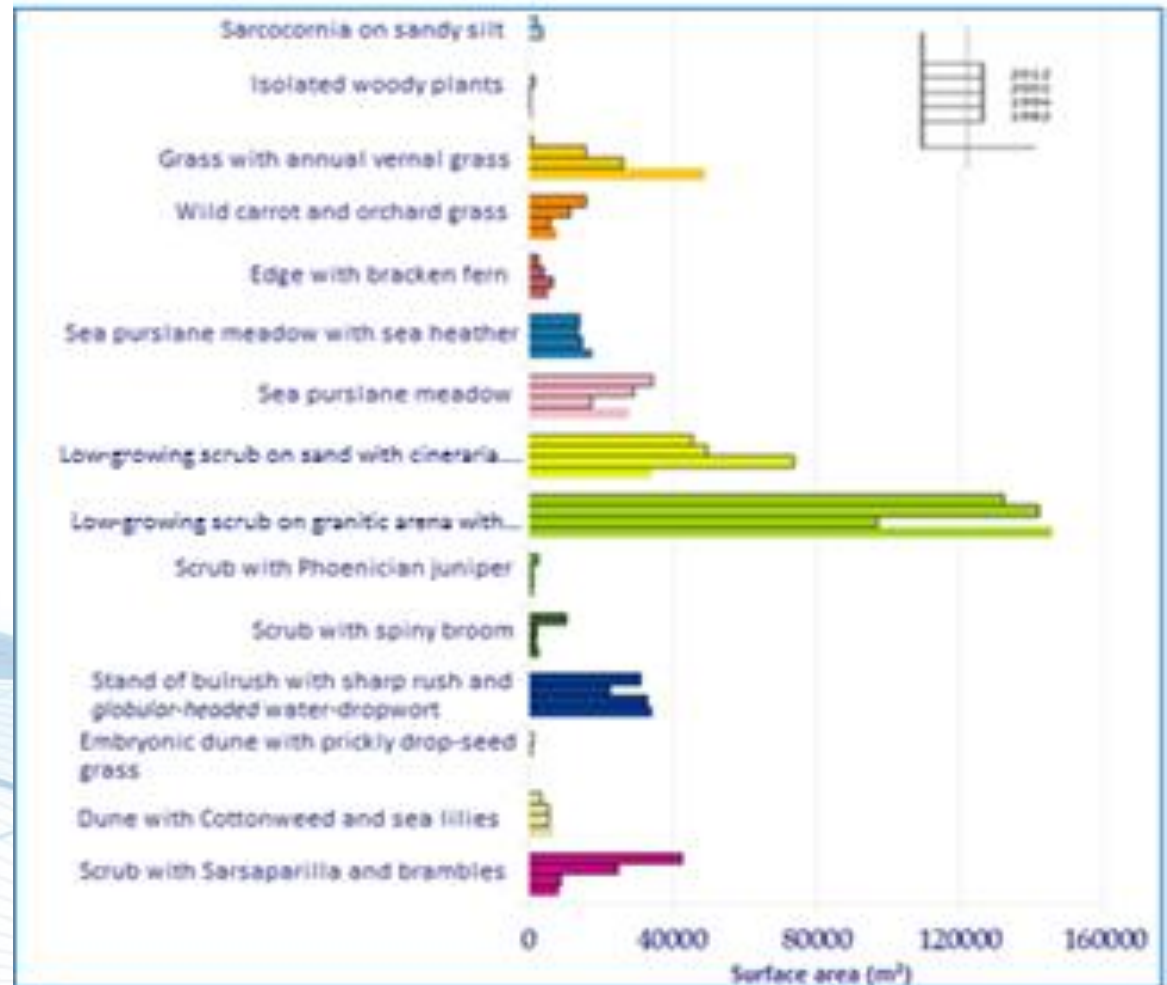
Scrub with Phoenician juniper

Scrub with spiny broom
Sarsaparilla scrub and
brambles

Stability:

Sea purslane meadow
Low-growing scrub on
sand

Bulrush stands



Vegetation dynamics: variation of natural factors

Grazing on Lavezzu Island:

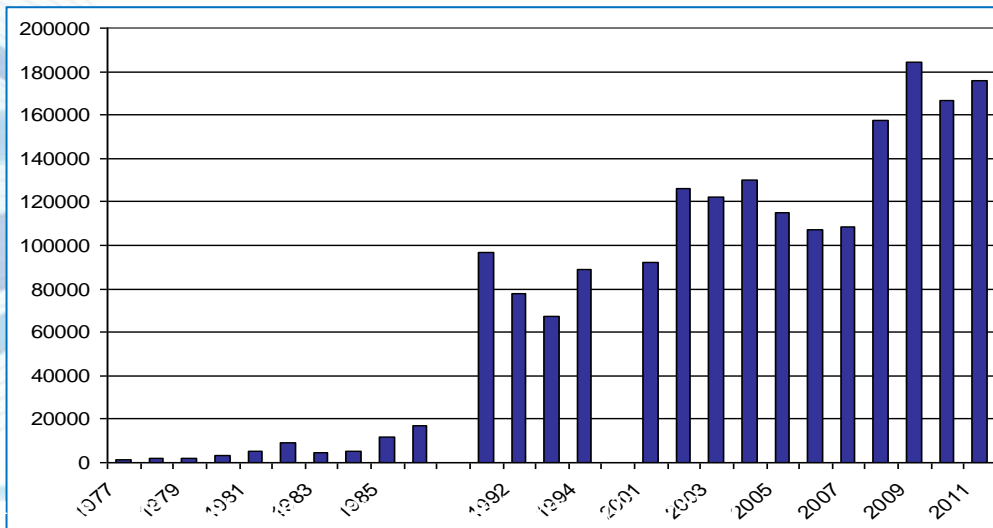
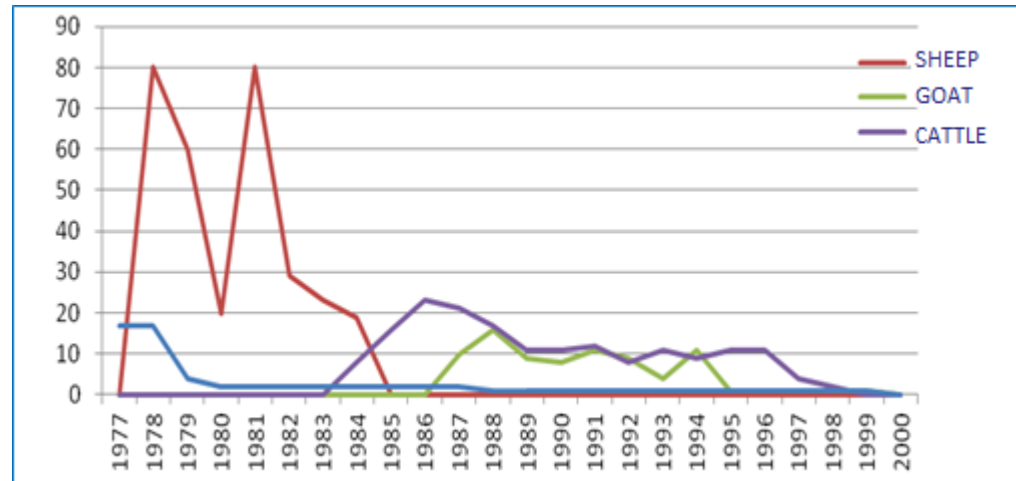
1977-1983 Strong sheep domination

1983 Introduction of cattle
Lack of sheep

1986 Introduction of goats

1995 Absence of goats

1999 End of grazing

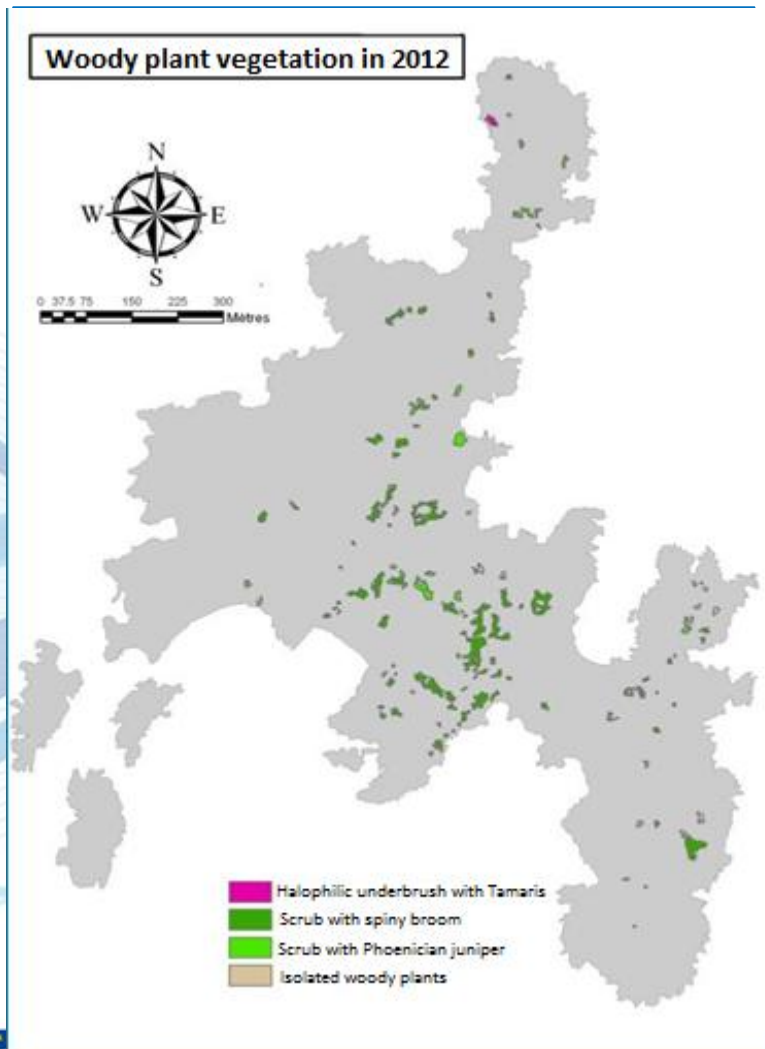


Visitors to Lavezzu Island:

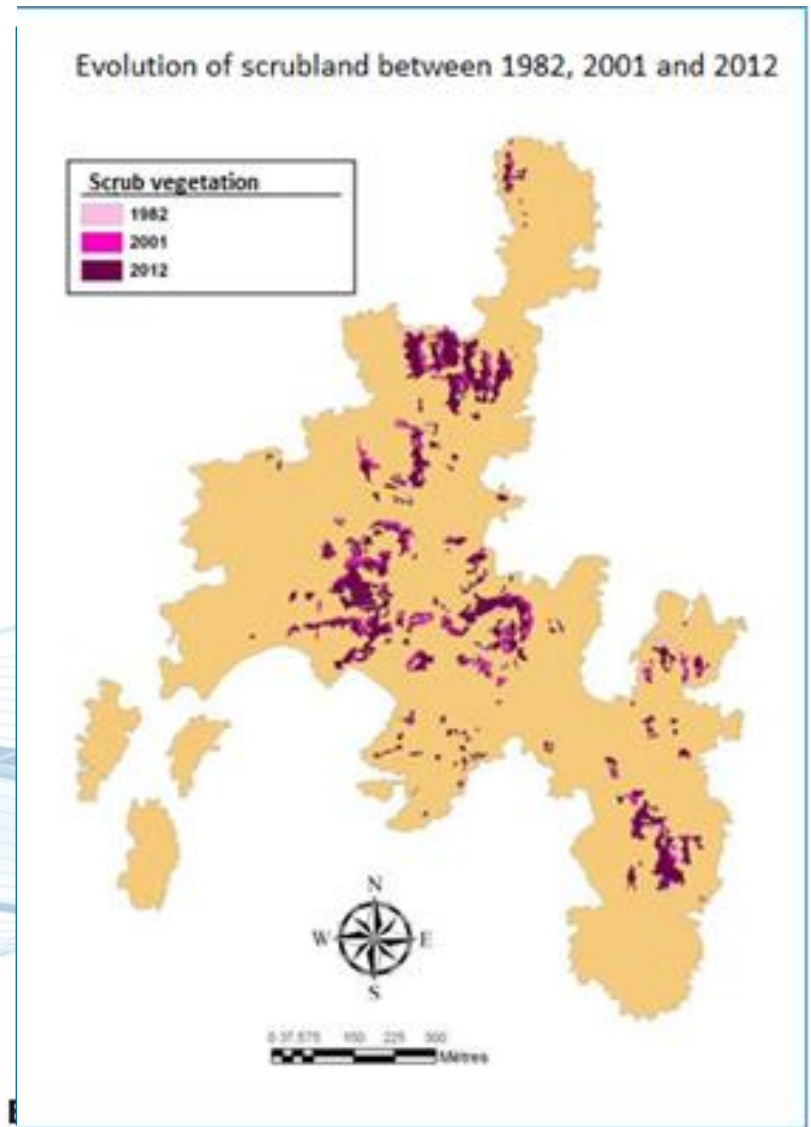
1982 < 10,000 people
1994 65,000 people
2001 90,000 people
2012 175,000 people

Vegetation dynamics: Analysis of the end to grazing

Progression of scrub with *Juniperus turbinata* and *Calicotome villosa*



Strong progression of scrub



Vegetation dynamics: Management measures



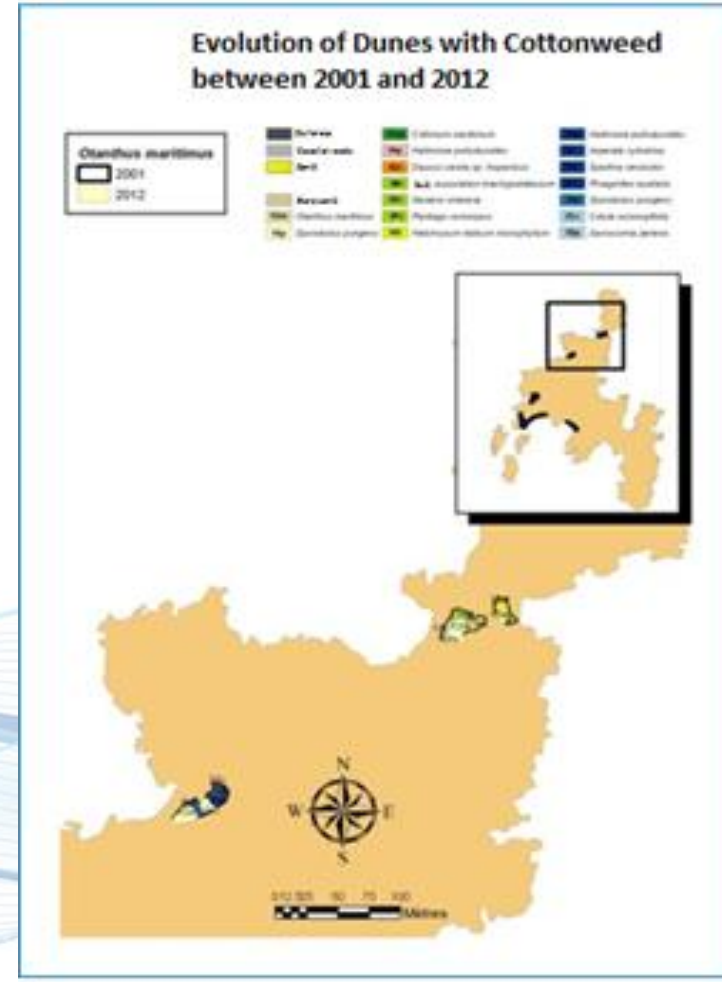
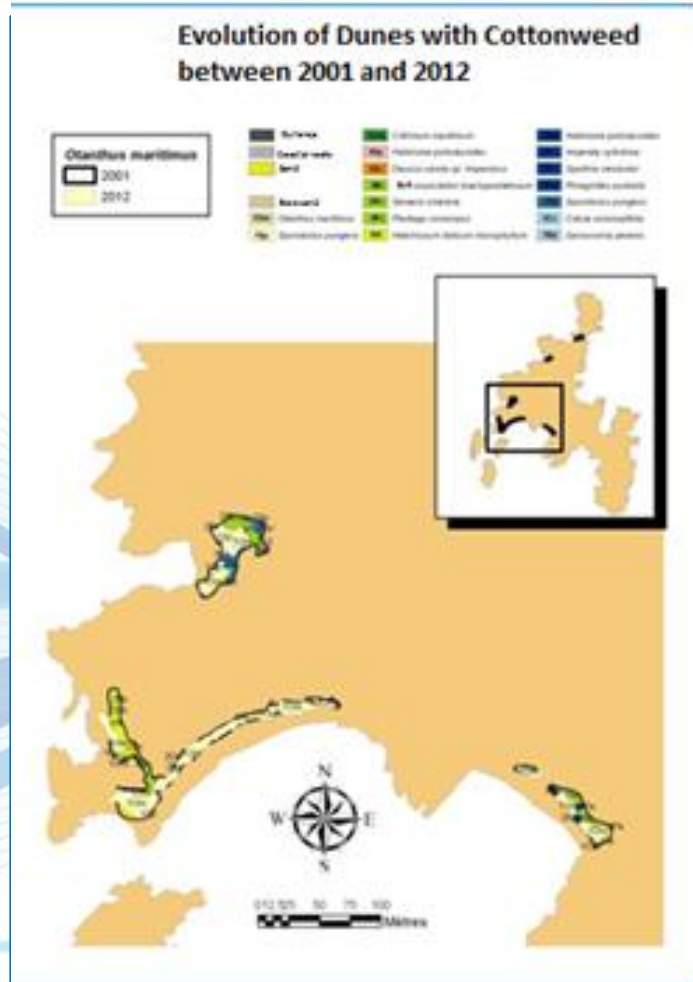
End of grazing=closing of environments:

- Development of woody plants
 - Development of tall grasses
 - Loss of biodiversity?
 - Risk for the species with high heritage value?
- +Positive effect on *Anthyllis barba-jovis*

No intervention
Reintroduction of grazing
Mechanical clearing

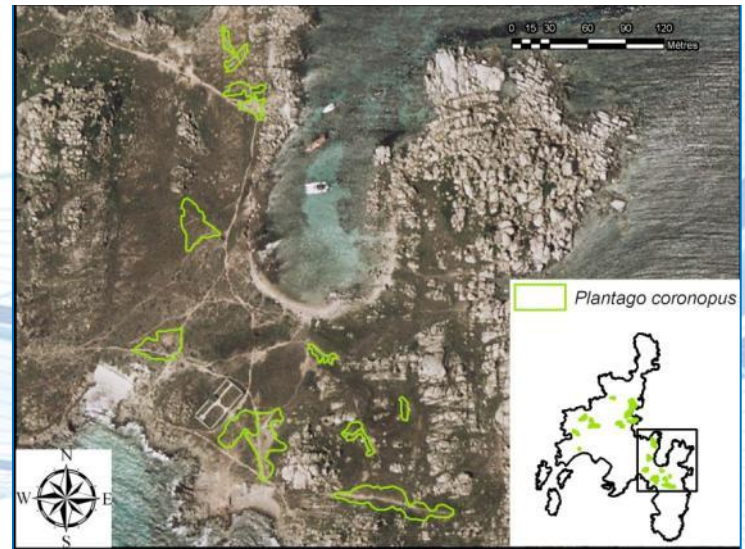
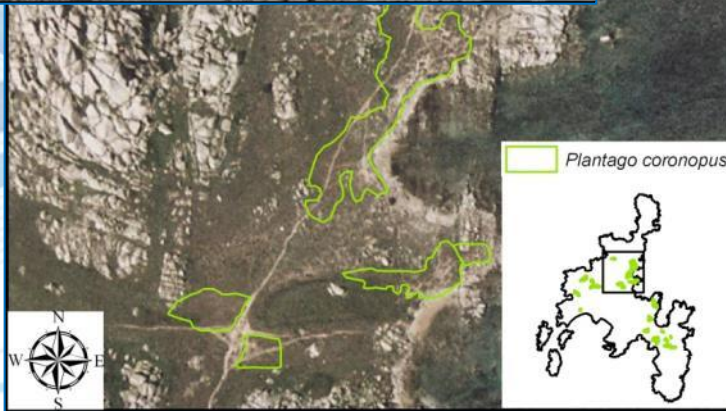
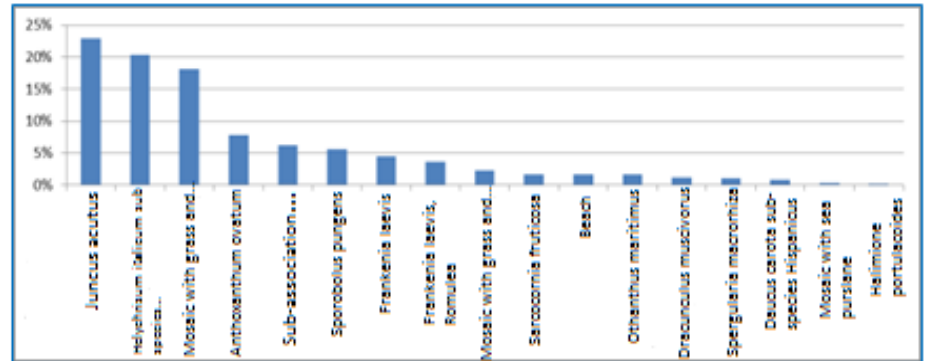
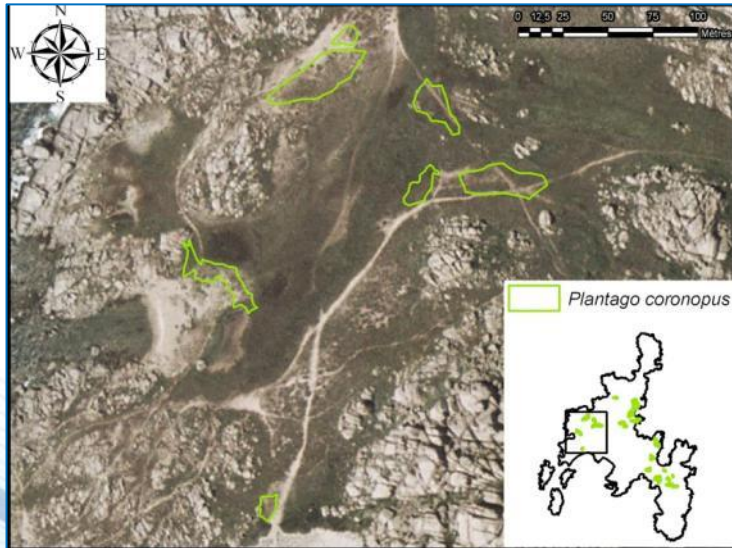
Vegetation dynamics: Analysing the impact of tourism

Fragmentation of dunes with *Othantus maritimus*



Vegetation dynamics: Analysing the impact of tourism

Apparition of a facies with *Plantago coronopus*



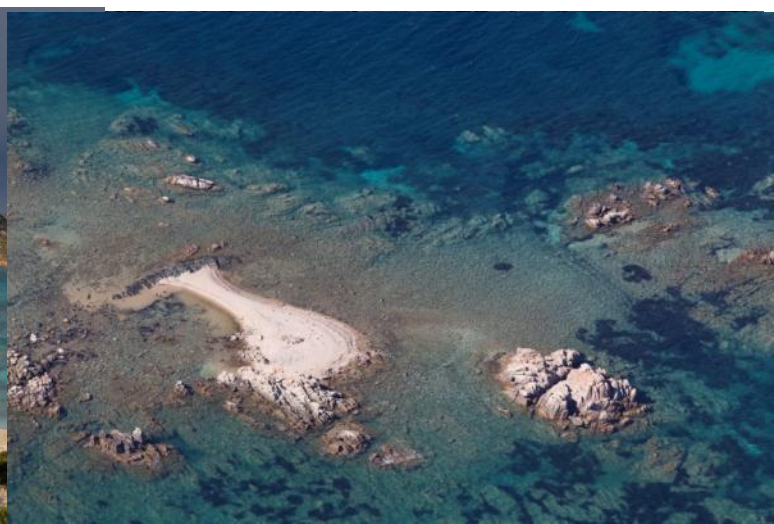
Increase in visitor numbers: impact of trampling



- Degradation of dune environments
- Degradation of areas attracting high numbers of visitors

Restricted access to fragile areas
Channelling of visitor traffic
Path maintenance





*Thank you for your
attention!*