



# THE LIFE PASTORALP PROJECT

LIFE16 CCA/IT/000060

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UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**DAGRI**  
DIPARTIMENTO DI SCIENZE  
E TECNOLOGIE AGRARIE,  
ALIMENTARI, AMBIENTALI E FORESTALI



Final Conference “GLOBAL CHALLENGES IN MOUNTAIN AGROPASTORAL SYSTEMS”, Forte di Bard (AO) 15-17 March 2023

# Life PASTORALP project

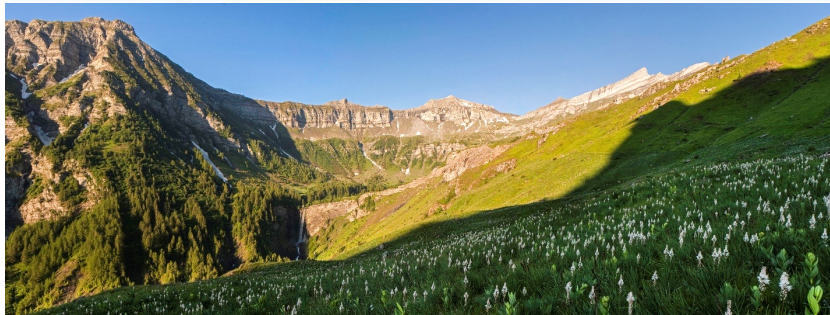


DURATION: 01/10/2017 - 31/03/2023 (5.5 YEARS)

BUDGET: 2,314,400 €

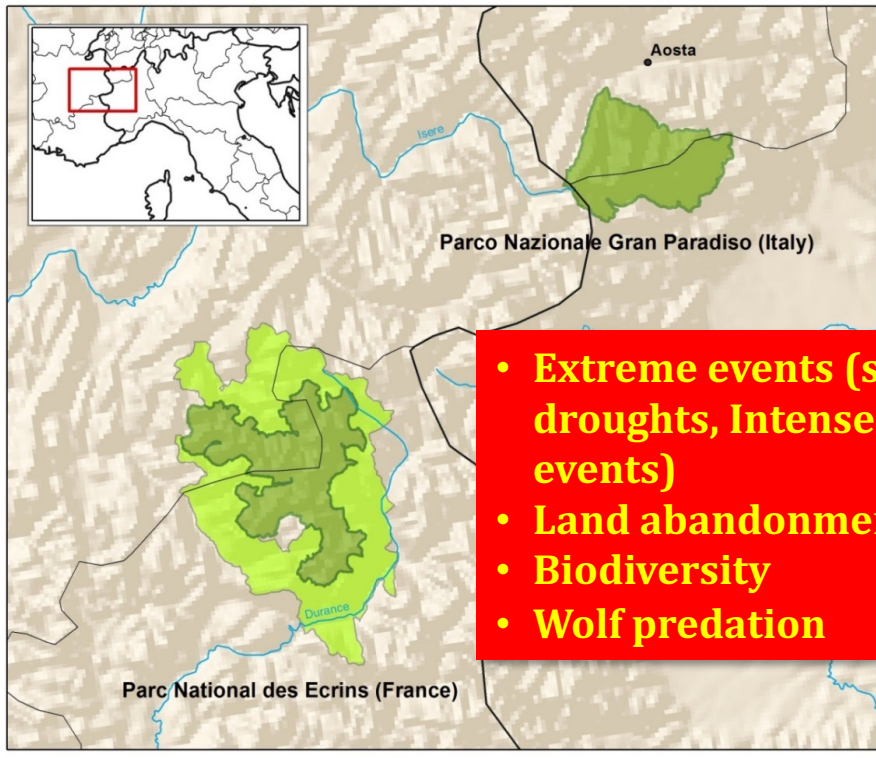


COFUNDED (60%) BY THE EUROPEAN COMMISSION (LIFE PROGRAMME, *CLIMATE CHANGE ADAPTATION*)



# Life PASTORALP Objectives

Reduce the **vulnerability** and increase the **resilience** of **alpine mountain pastures** and **pastoral communities** by assessing **impacts of climate change** and testing **feasible, integrated and improved adaptation technical measures** and **policies recommendation** in intended case study areas (**PNE and PNGP**) – two open air laboratories



- **Extreme events (summer droughts, Intense rainfalls events)**
- **Land abandonment**
- **Biodiversity**
- **Wolf predation**

- **70.000 ha of extensive pastures grazed by sheep, cattle goats, horses**
- **70% national collective properties regulated by national laws (creation of pastoral units and breeder consortia)**
- **First National protected area in Italy (1922)**
- **Protect the Alpine ibex (*Capra ibex* L.) at risk of extinction, now >2800 individuals.**
- **71.000 ha of rural area and 8.400 habitants**
  - **Cattle and sheeps**



# Life PASTORALP overall strategy



Farmers' perception of climate change & capacity for adaptation



Impacts of climate change



Vulnerability of the entire system



Best adaptation strategies for adoption



Biodiversity conservation



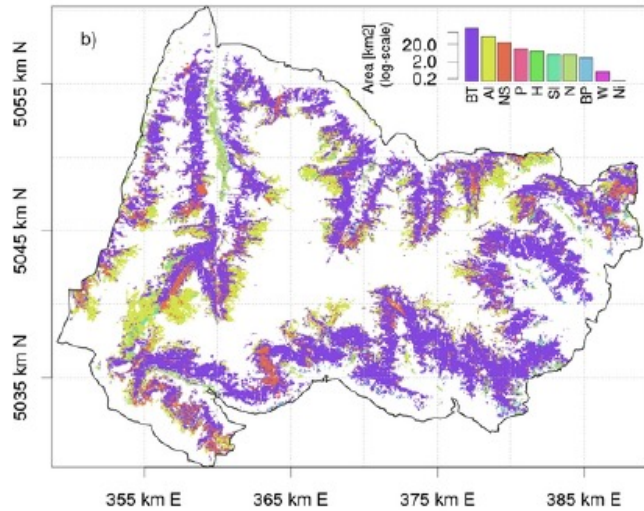
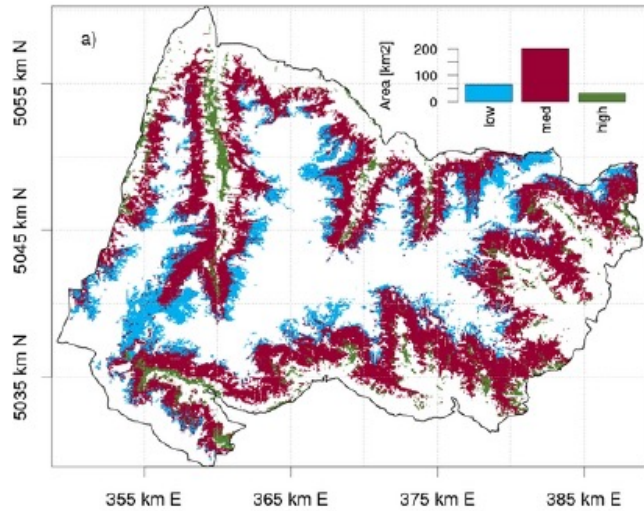
Replicability  
Governance and adoption

**Mountain permanent grasslands (Multifunctionality)**

# Pasture mapping update

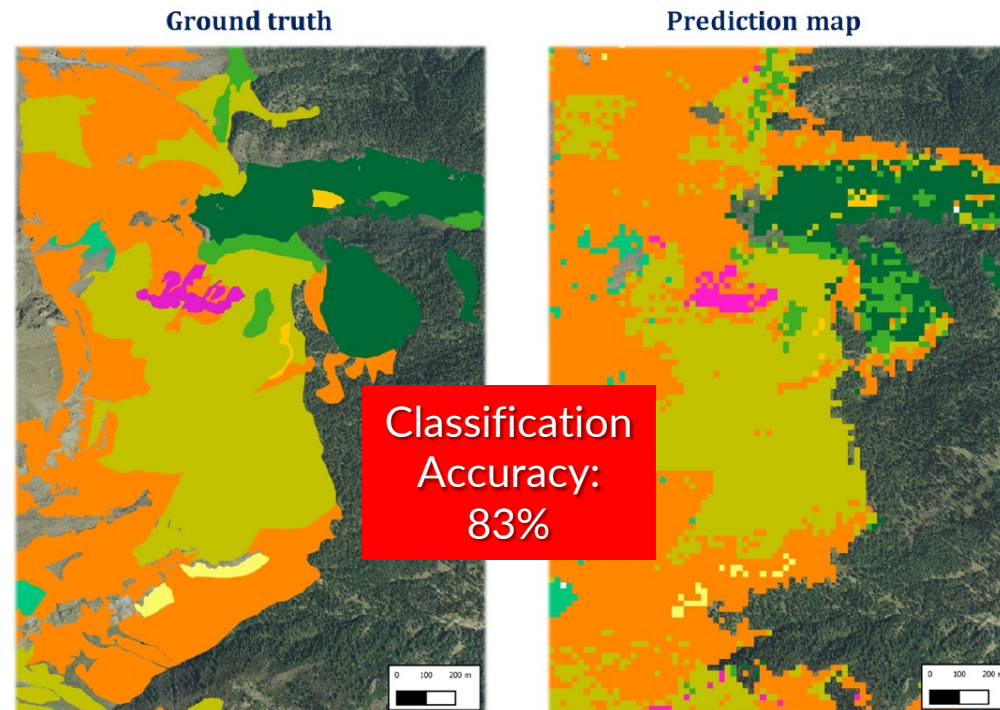
Stendardi L. et al., 2022

Filippa G. et al., 2022

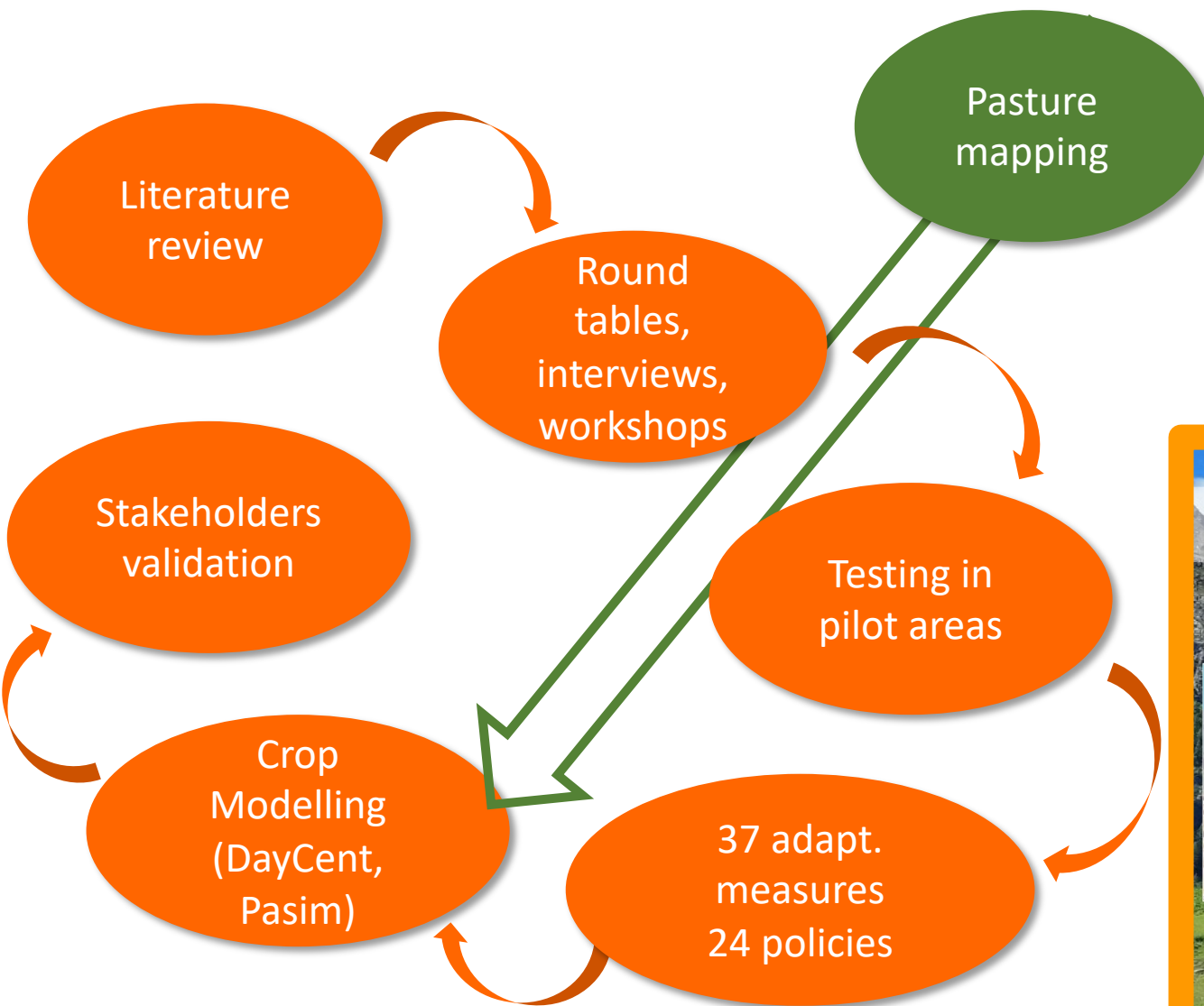


More than 10,000 hectares of pastureland mapped

- Field surveys & remote sensing (Sentinel 2) & modelling
- Harmonized legend: Grasslands (Y-N) / productivity / 13 pastoral categories



# Adaptation measures and policies recomm.



This composite image shows a mountain landscape with sheep and several text boxes. The text boxes include:

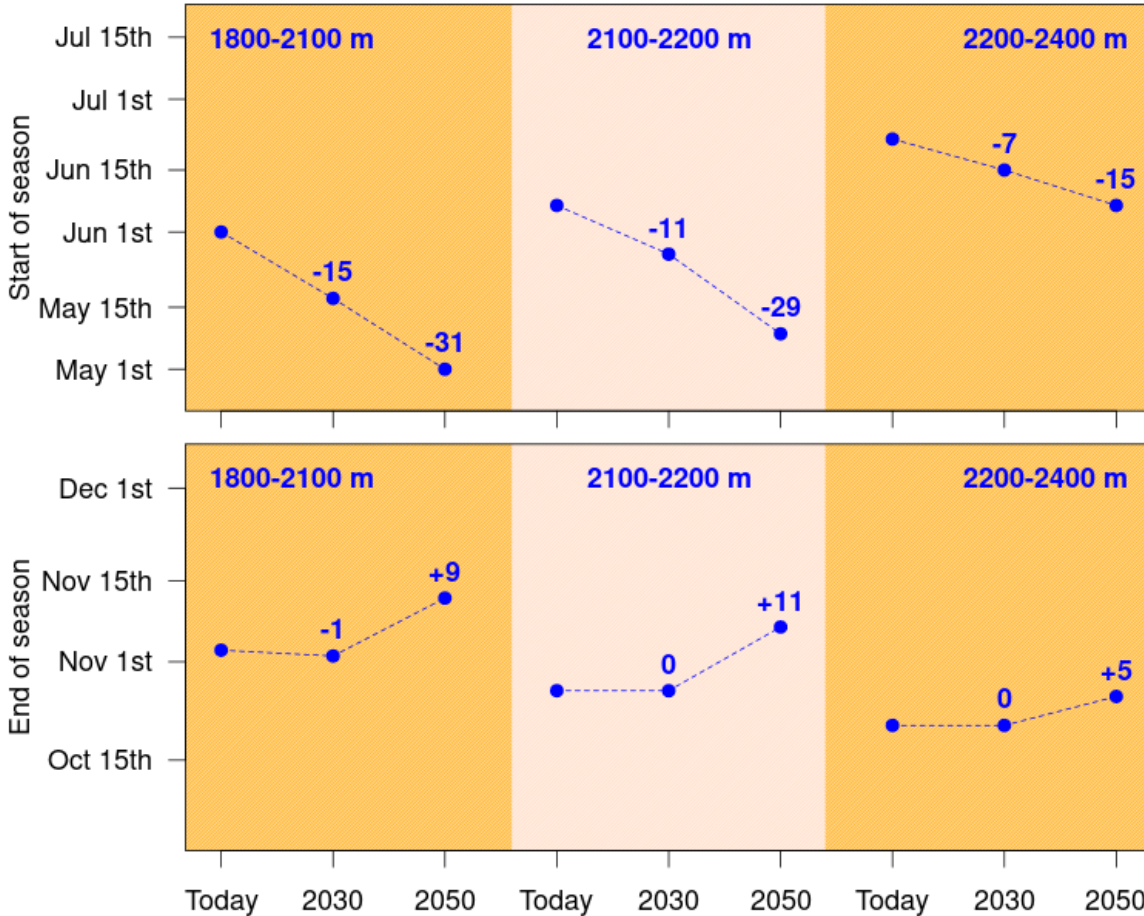
- Warning boxes:** 'springs...', 'sources...', 'difficulty to make the herd drink', and 'additional pastures Reduction of the stocking rate'.
- Warning box:** 'WARNINGS about BIODIVERSITY or MANAGEMENT' with the text: 'Beware of overgrazing on fragile grasslands or other impacts on species. Difficulty in keeping the same milk production'.
- Technical box:** 'TECHNICAL DIFFICULTIES and FACTORS for FAILURE or SUCCESS' with the text: 'Guided grazing or installation of fences=> shepherd skills. Finding of free grasslands => to support in the search of lands'.

# Biophysical vulnerability

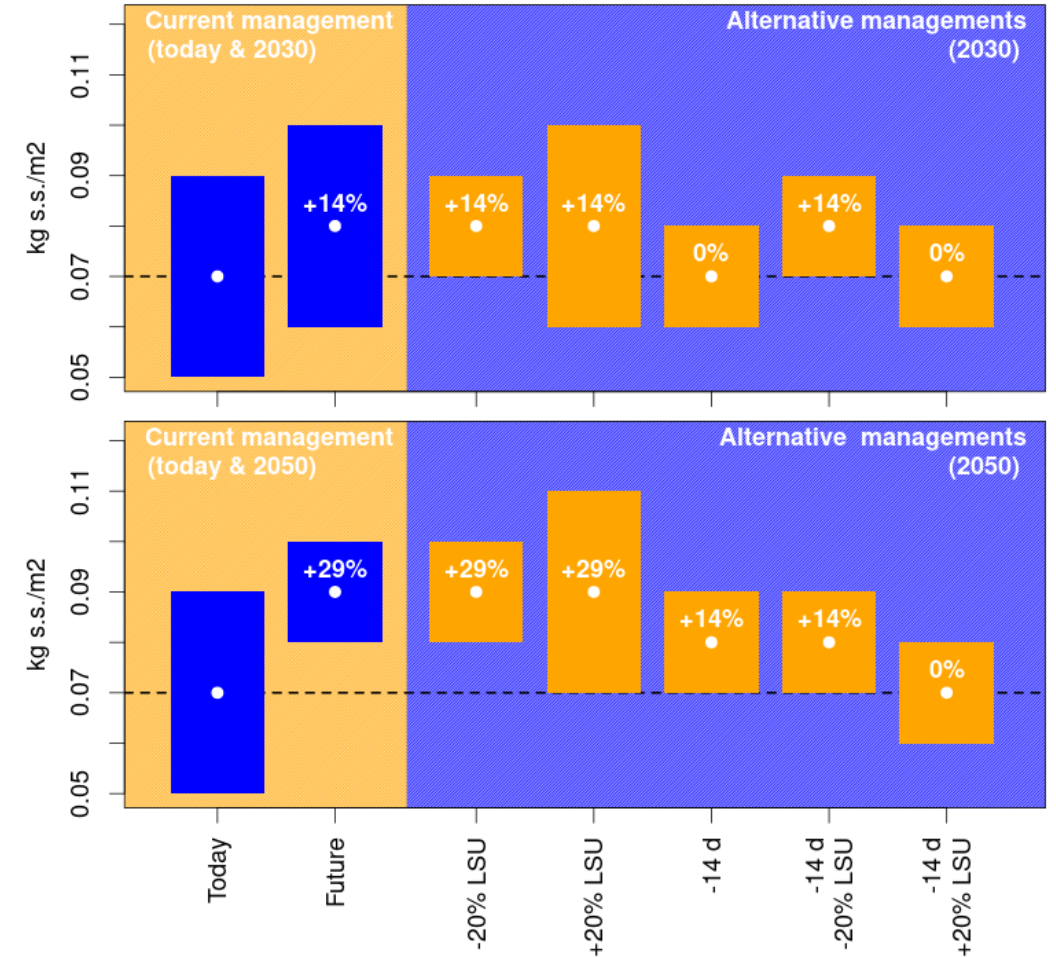
Brilli et al., 2023



## Start and end of the growing season



## Adaptation strategies Productivity peak (2200-2400 m)



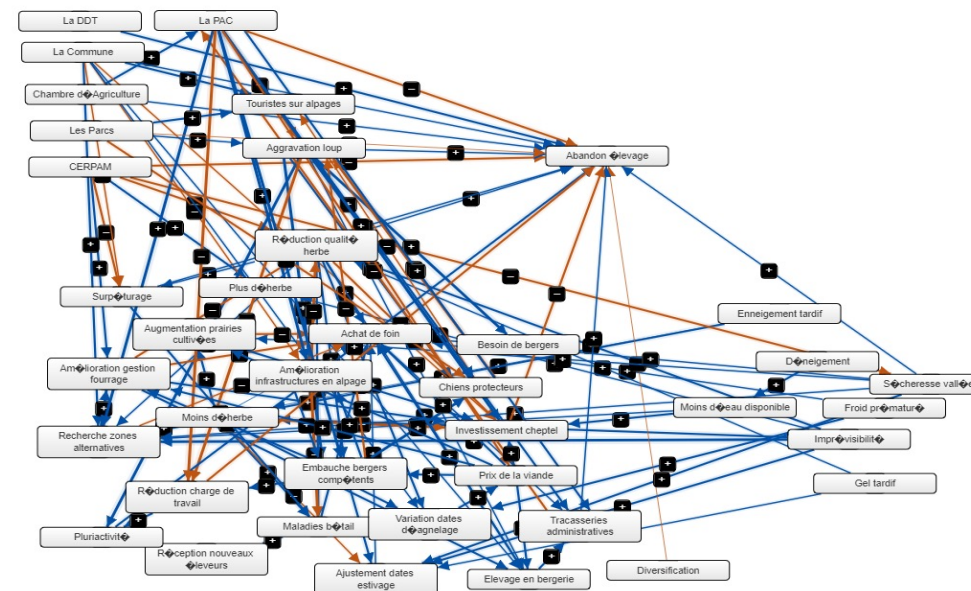
UNCERTAINTIES

# Socio-economic vulnerability



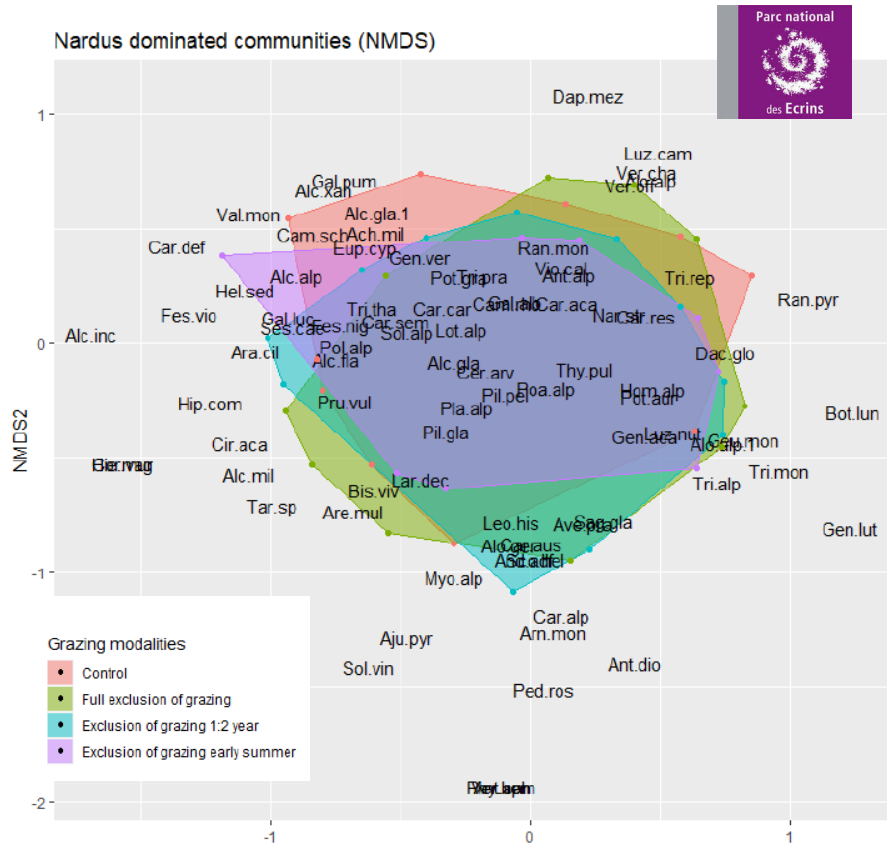
KEY FACTORS OF PASTORAL SYSTEMS			
Gran Paradiso National Park		Parc National des Ecrins	
Factors	Centrality <sup>2</sup> Score	Factors	Centrality Score
Upland grasslands	14.47	CAP subsidies	8.88
Relevance of farm productivity	12.01	Predation	8.73
Revenue	11.15	Experienced shepherd hiring	8.30
Bottom valley meadows	10.00	Upland grassland quality reduction	8.20
Tourism	8.00	Search for alternative forage resources	6.17
Farm organisation and life quality	7.96	Investments	6.15
Predation	7.87	Abandonment	5.98

	Baseline	With training and infrastructure
Relevance of upland pastures	↓ ↓ ↓	↓ ↓
Hay buying	↑ ↑ ↑	↑ ↑ ↑
Intensification (bergerie)	↑ ↑	↔
Organisation and life quality	↓ ↓	↓





# Biodiversity vulnerability



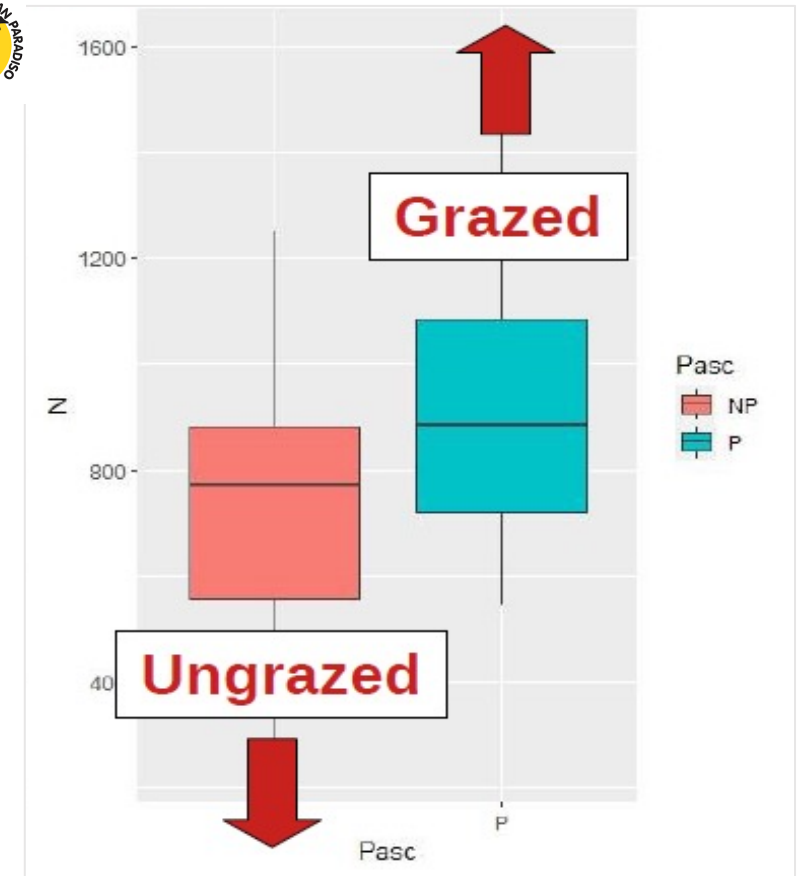
thermophilisation of alpine plant communities due to *Nardus stricta*

exclusion from grazing in early summer -> slight increase in plant biodiversity

16 pastures PNE

10 pastures PNGP

320 invertebrate species analysed

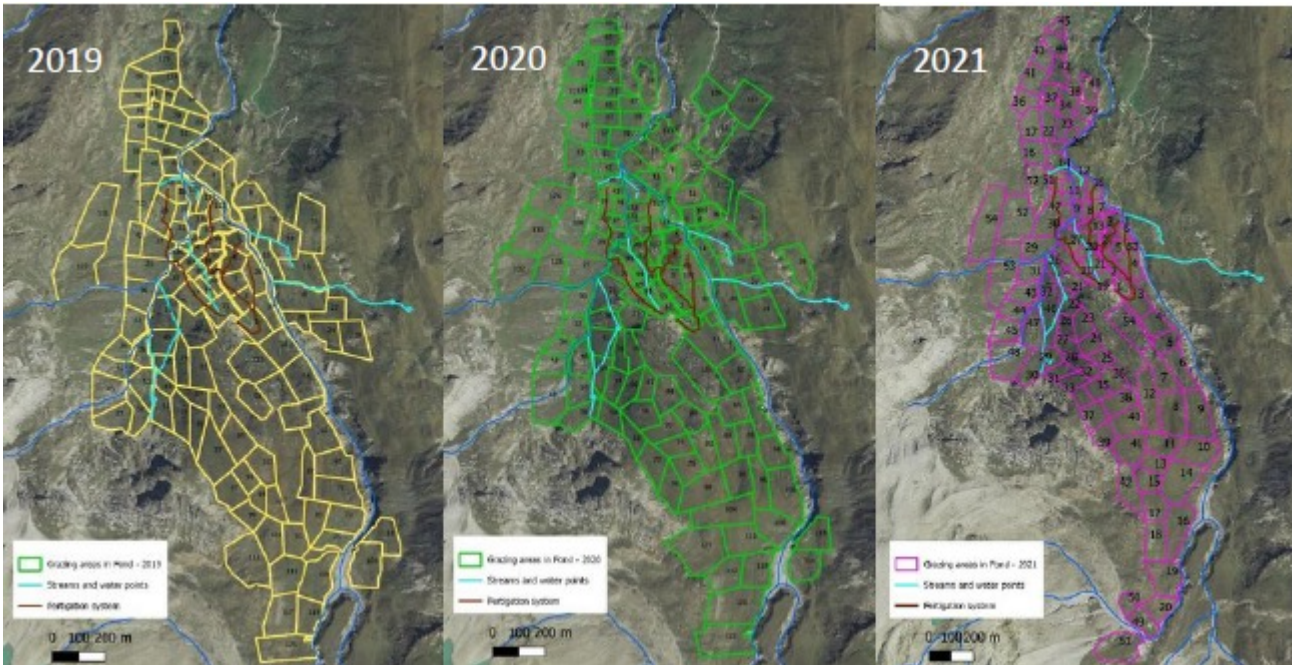


- Positive effect of low density grazing on invertebrate biomass
- Un-grazed patches as nectar sources for adult pollinators

# Pasture management and demonstration areas

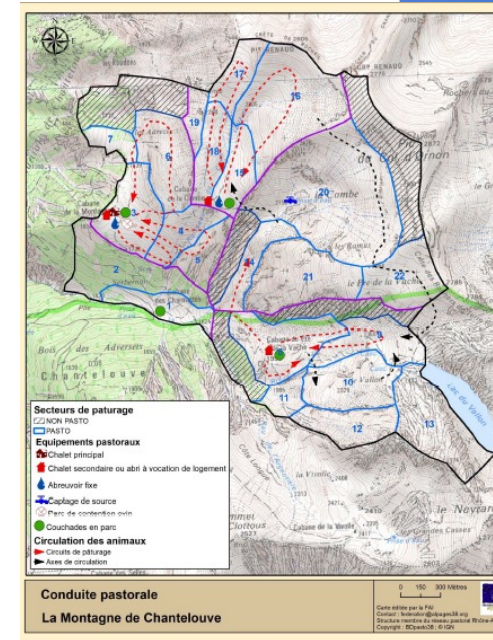


## Diagnostic pastoral de la Montagne de Chantelouve



20 grazing plans

(Guidelines for pasture management and adaptation in test areas)



Commune de Chantelouve  
Bonnais, Parc National des Ecrins, Département de l'Isère

Janvier 2019

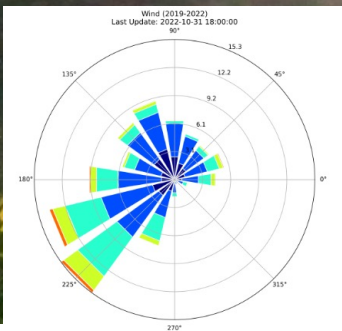
9 diagnostic plans

# PATORALP WEB-PLATFORM

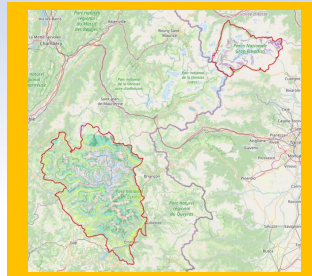


## Real time monitoring

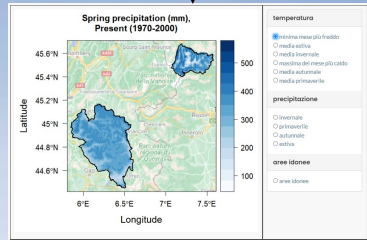
Phenocam  
NDVI  
Snow cover  
Temperature



## Cartography



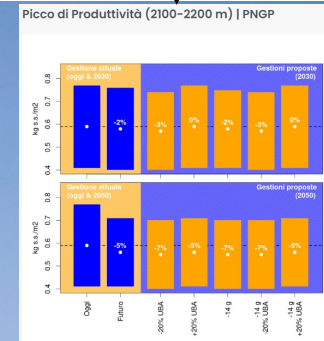
## Impacts



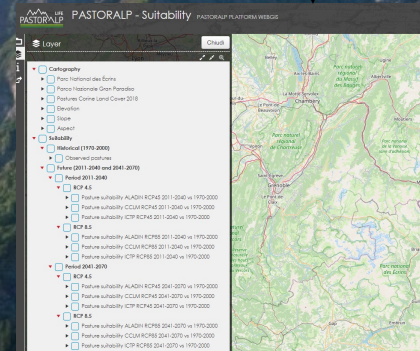
## Adaptation

STRATEGIE DI ADATTAMENTO	POLITICHE DI ADATTAMENTO
<p><b>Rischi climatici</b></p> <ul style="list-style-type: none"> <li>• Scarsità di neve, inverno molto secco oppure</li> <li>• Precoce fusione della neve seguita da gelate primaverili oppure</li> <li>• Primavera tardiva o fredda</li> </ul>	<p><b>Conseguenze sull'ambiente (suolo, vegetazione e acqua) o sugli animali</b></p> <p>Scarsa produzione di erba a causa della mancanza di acqua o delle basse temperature o dell'arresto della crescita per gelo</p> <p>Scarsa produzione di erba all'inizio della stagione e/o erba troppo tenera</p>

## Vulnerability



## WebGIS



La plateforme PASTORALP a pour but de soutenir les communautés pastorales pour l'adaptation au changement climatique et de sensibiliser les parties prenantes, les groupes cibles et le grand public sur les questions liées à la vulnérabilité, aux impacts et à l'adaptation au changement climatique en haute montagne.

# PATORALP WEB-PLATFORM *Questionnaire*

## QUESTIONNAIRE



- 13 multi-choice questions
- Important for evaluating the project

PATORALP a pour but  
gement climatique  
blic sur les questio  
atique en haute m

The screenshot shows the top part of a questionnaire web page. At the top, there is a header image of a mountain landscape with the logo 'LIFE PASTORALP'. Below the header, the title 'Questionnaire d'évaluation de la PLATEFORME PASTORALP' is displayed. Underneath the title, there is a link: 'Visitez la plateforme à ce link : [PLATEFORME PASTORALP](#)'. Below the link, there is a user profile section showing the email 'camilladibari@gmail.com (non condiviso)', a 'Cambia account' button, and a 'Bozza salvata' button. The main content area shows a question titled 'Âge' with a dropdown menu currently set to '< 18' and a radio button next to it. The word 'Années' is visible to the right of the dropdown. A green pencil icon is in the bottom right corner of the form area.

# PASTORALP: the long-term legacy



EASILY  
UPDATED  
CARTOGRAPHY

PASTORALP  
PLATFORM

DEMONSTRATION  
AREAS

SCIENTIFIC  
DISSEMINATIO  
N

NETWORKING

JOINT POSITION  
PAPER





# Let's graze our future!!! 😊



  
LIFE  
**PASTORALP**  
Pastures vulnerability and adaptation strategies to climate change impacts in the Alps

[www.pastoralp.eu](http://www.pastoralp.eu)

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