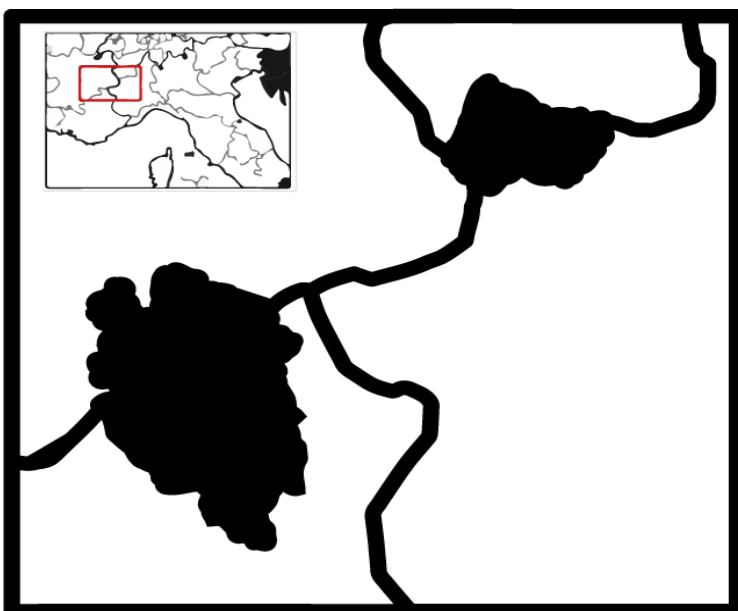# LIFE PASTORALP

LAYMAN'S REPORT

LIFE16 CCA/IT/000060

Grazing ecosystems play a key role in **biodiversity conservation**, **protecting against soil erosion**, **maintaining the landscape** and **preserving open spaces** useful for tourism activities. They also form the basis of local agricultural systems by safeguarding the **local economy**.

It is therefore necessary to analyse the effects of climate change on the characteristics of Alpine grasslands and their management in order to propose effective operational solutions that can address the expected impacts and mitigate their negative effects.

7 European partners

More than 70 people involved

2 National Park

PASTORALP is a LIFE project resulting from the collaboration between Italian and French partners from institutions, the research world and nature park management bodies.

The overall **objective** of PASTORALP is to reduce the vulnerability and increase the resilience of Alpine pastoral systems to climate change in two study areas: the Gran Paradiso National Park and the Des Ecrins National Park

Objectives:

- ☐ Analysis of climate change **impacts** on alpine grasslands using innovative tools
- ☐ Analysis of the environmental and socio-economic **vulnerability** of these systems in the current and future climate
- ☐ Identification of **technical measures and political recommendation** for climate change adaptation
- ☐ Definition of an **integrated adaptation plan**
- ☐ Implementation of **decision support** tools
- ☐ Increased **awareness and capacity building** on climate change issues of local **pastoral communities**

Budget 2314400 euro

5 years and a half of duration

38400 people involved

An **updated mapping** of the pasture vegetation of the Gran Paradiso National Park and the Parc National Des Ecrins was produced.

Thanks to the integration of **field surveys**, carried out between 2019 and 2021, and **remotely sensed data**, a shared and harmonised classification of **pastoral categories** was obtained between the two parks.

Remote sensing data (Landsat and Sentinel-2 images) were used to develop a **methodology for classifying and mapping** the main types of mountain pastures at a **functional scale for pastoral management**.

The mapping methodologies developed during the project are easily **replicable in other Alpine contexts**.

More than 10000 hectares of pastureland mapped

13 pastoral categories

3 productive pasture macro types
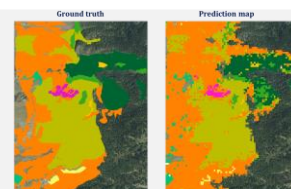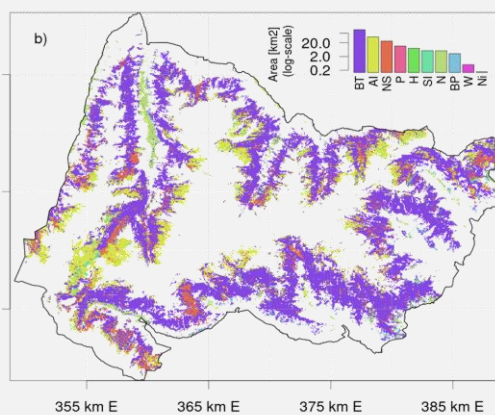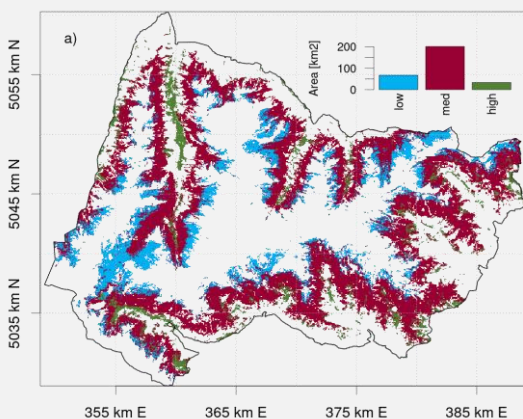

Classification Accuracy: 83%

Starting in spring 2019, field data were collected on the **vegetation dynamics**, **biodiversity and phenology of the pastures** in pilot areas of the two parks. These studies evidenced an increase in the species *Nardus stricta* in the plant communities of the nival valleys. This indicates that a replacement of a 'cold' alpine community by a generalist community is underway and is a sign of thermophilisation of alpine plant communities. Furthermore, according to our results, an exclusion from grazing in early summer would lead to a slight increase in biodiversity.

The investigations regarded also **numerous invertebrate communities**, measuring the variation in species richness and diversity according to different grazing management at low and high altitudes. In this case, **low grazing intensity** was found to have **positive effects on invertebrate biomass and species numbers**.

16 pilot sites in the Parc National Des Ecrins

10 pilot sites in the Gran Paradiso National Park

320 invertebrate species analysed
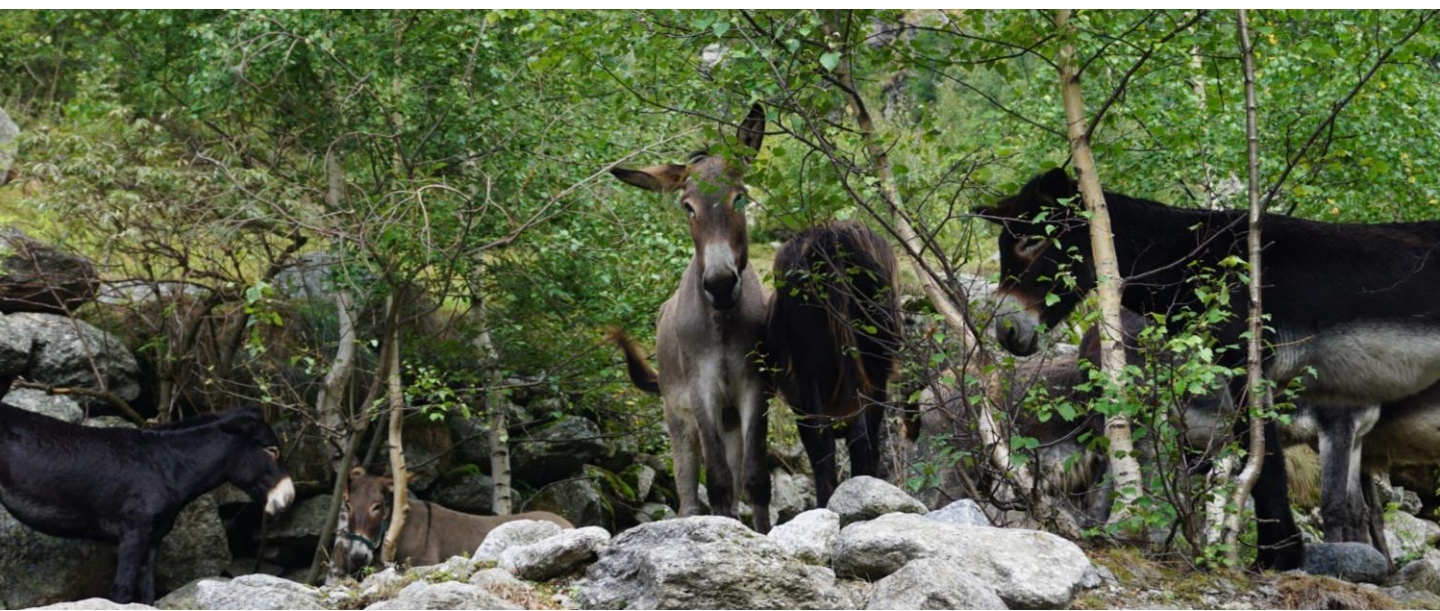
The project enabled the definition of the **vulnerability** of alpine grasslands in the two national parks in **environmental and socio-economic terms**.

Through constant interaction with **local stakeholders and relevant experts**, **adaptation measures and policy recommendations** were identified to mitigate the effects of climate change in mountain areas.

These measures were defined on the basis of their **applicability**, impact on **biodiversity**, **risk** factors and **difficulties** of implementation at the operational level.

63 environmental and socio-economic indicators identified

37 technical adaptation measures

24 policy recommendations

The impact of climate change on the **production** and **phenology** of Alpine pastoral resources in the **near** (2030) and **far** (2050) **future** was predicted by using simulation **models and satellite data**, and the effect of appropriate management strategies in terms of adaptation and emissions was analysed.

The models used made it possible to predict the evolution of the pasture production cycle in the near and far future at different altitudes.

The **peak of biomass production** will be **earlier**, especially at higher altitudes. An **earlier start of the growing season** and a **postponement of the end of the growing season** are expected.

Many are the **uncertainties** resulting from the modelling approach, further and appropriate science-based investigations are needed.
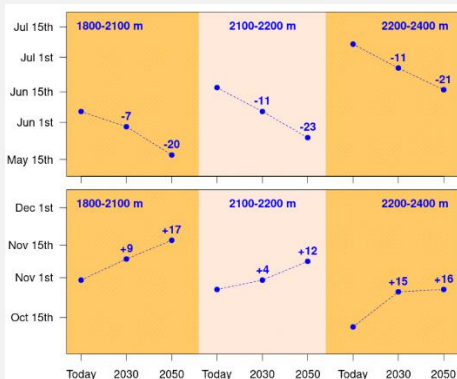
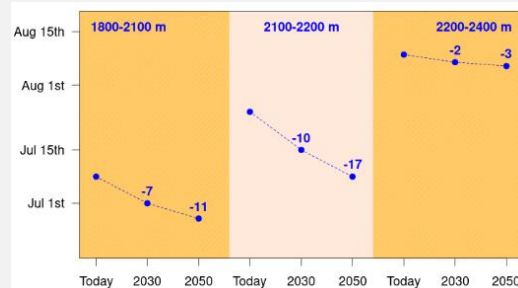## 2 simulation models

36 impact indicators generated

5 simulated adaptive measures

Dates of beginning and end of vegetative season Gran Paradiso

Date of peak productivity Des Ecrins

An **integrated adaptation plan** and **replication plan for pasture management** has been drawn up. **Guidelines and policy recommendations** were produced for more effective decision-making in pasture management to cope with future climate effects and biodiversity conservation.

Some of the **good practices** highlighted thanks to our project have been included in the national platform on adaptation to climate change created by **ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale) and Ministry of Ecological Transition.**

Thanks to the purchase of land, it was possible to see in the field the benefits of applying appropriate adaptive grassland management in permanent demonstration areas.

2 permanent demonstration areas

1 integrated adaptation plan

1 replication plan
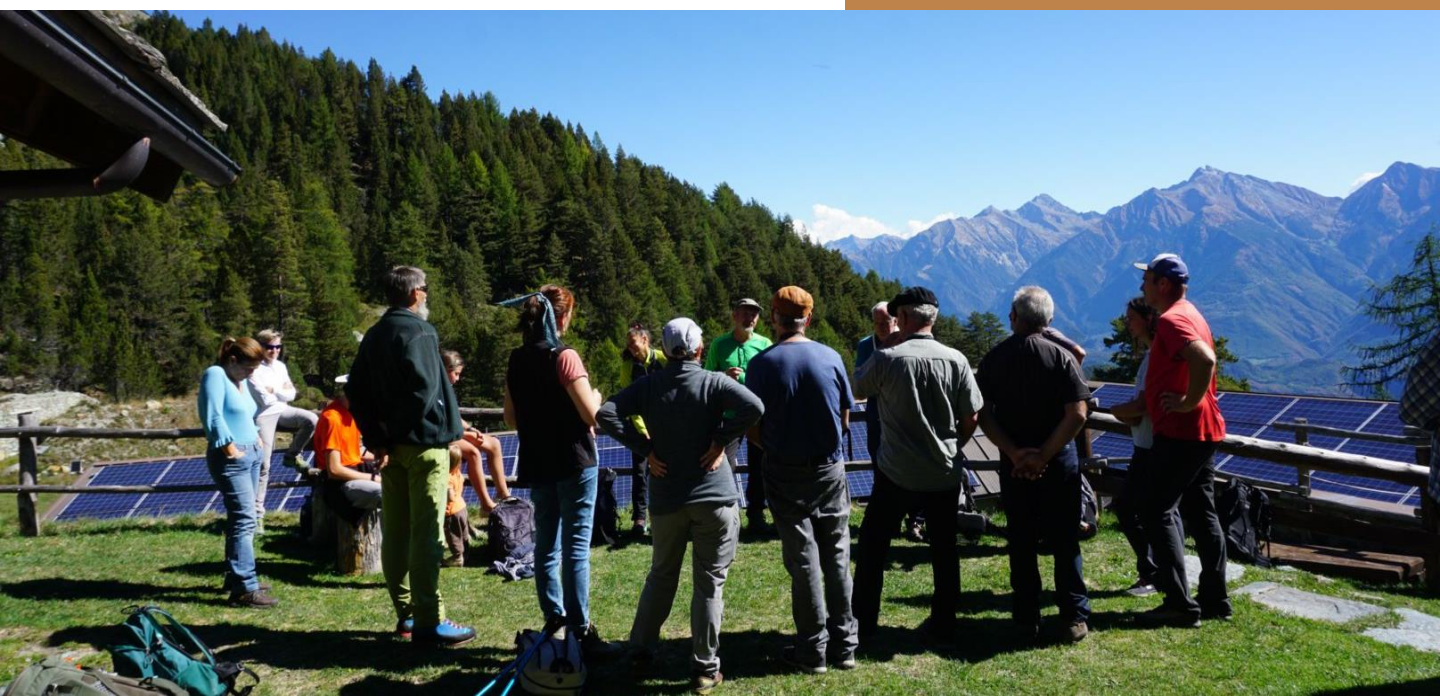
Local actors such as livestock farmers, technicians, policy makers and academics were involved throughout PASTORALP duration. Two **Steering committees** were established, and several **discussion tables**, **interviews, workshops and seminars** were organized.

This ensured **awareness and capacity building** on mountain pastures and climate change issues, ensuring sharing and synergising ideas and direct experience.

In addition, an **online platform (PASTORALP platform)** was developed containing the **project results** and designed in an interactive manner, as a decision support tool and for greater dissemination of the identified adaptation strategies.

228 local actors involved

8 videos produced

Over 15 networking activities

The **LIFE PASTORALP** project will continue to carry out some of the activities, such as the **monitoring** of alpine pastures, the promotion of **technical measures** and **policy recommendations**, the implementation and **replication** of grazing plans and diagnostic plans for more climate resilient pastoral systems, in order to preserve pastoral resources, related ecosystem services, and the activities of local communities.

The **PASTORALP platform** entails all the results obtained such as the cartography for pastoral management, real-time data from cameras and sensors placed in the study areas, current and future climate data, adaptation measures and policies, vulnerability analysis. The platform has a dynamic and user-friendly design which can be used by experts and no-expert users.

20 grazing plans

3 languages of the platform

9 diagnostic plans
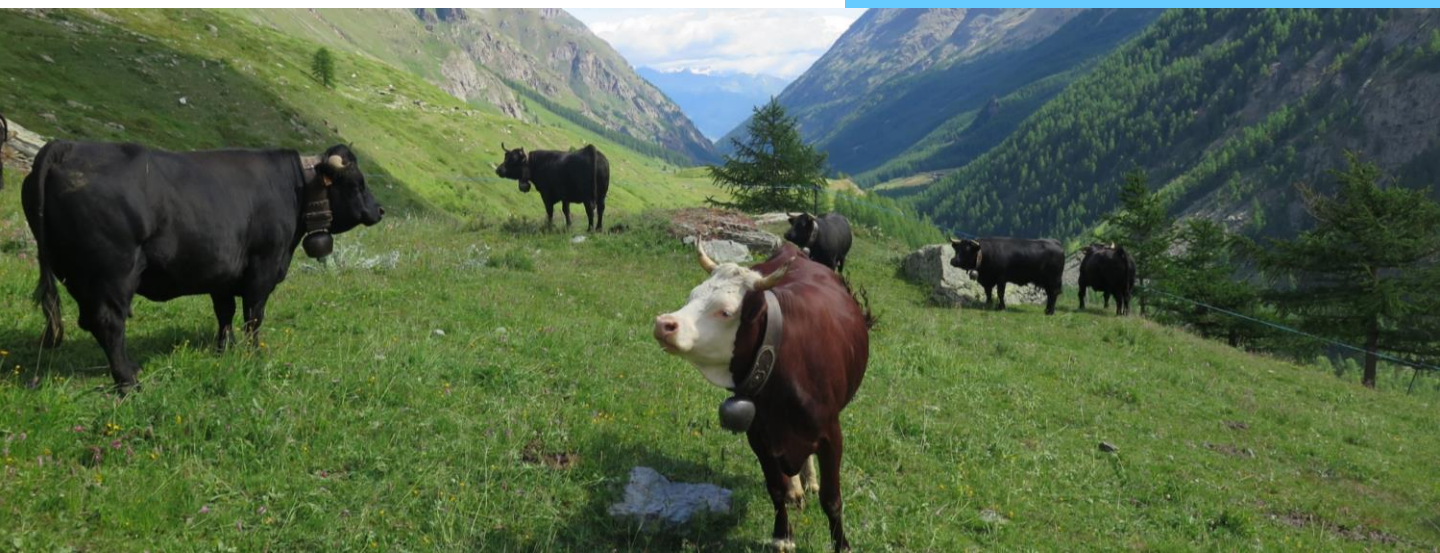
LIFE PASTORALP

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

LIFE PASTORALP
LIFE16 CCA/IT/000060
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Budget: 2314400 €

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