

Enhancing the provision of ecosystem services by cattle grazing on a ski station



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Synergies between livestock farming and ski stations

- livestock: forage resources of high mountain ranges
- ski resort: pasture consumption - stability of the snowpack



Objectives

1. Analyse the effects of a ski station on the farming systems in the area, considering farmers' opinions.
2. Determine the factors influencing pasture use by cattle in the ski resort, and suggest correcting measures where needed.

Material and Methods

Aramón-Panticosa ski station

Spanish Pyrenees, **297 ha** resort (1450-2200 m)
Grazed in the summer-early autumn by a free-ranging
communal cattle herd (10 farmers)
2011: 314 cows and their offspring



Objective 1: Farming systems and farmers opinions

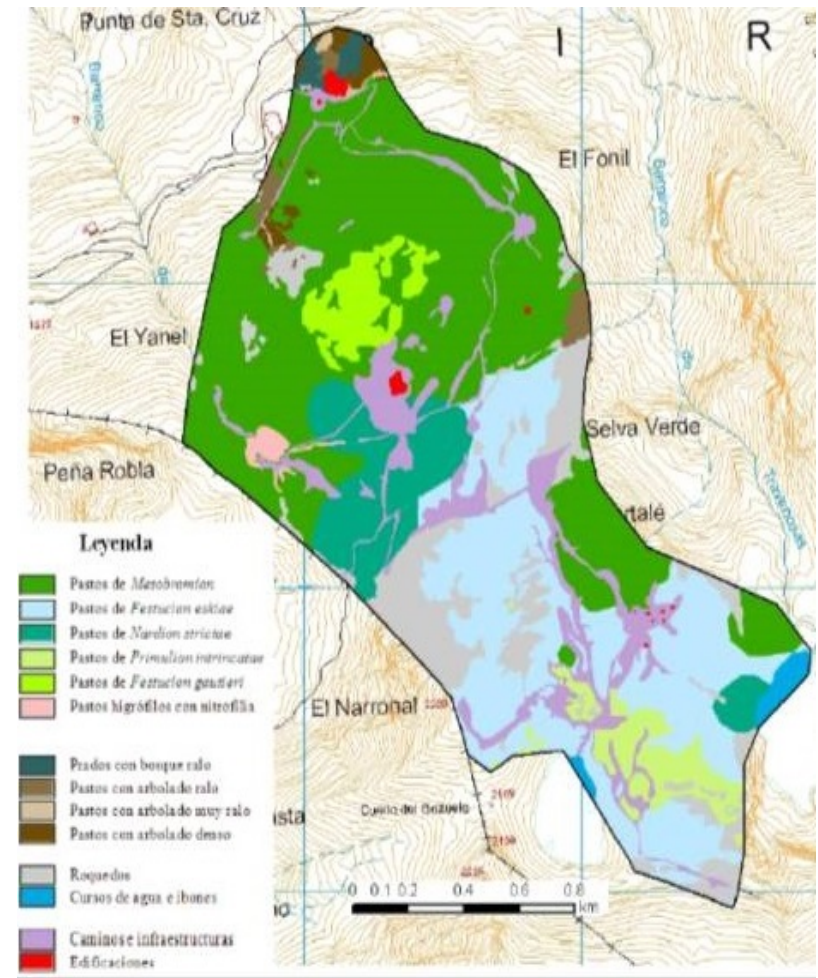
Structured interview to all farmers:



- **Production system**
*herd size, land use
management, performance...*
(EAAP 2013)
- **Opinions**
*environmental concerns
effects of the ski station*

Objective 2: Space use by cattle

- Data recording
 - weekly observation during daylight
 - scan sampling each 30 min
group size & grazing area
- Geographic Information System
 - ArcGis Desktop 9.3*
 - 9 vegetation types, pastoral value
 - altitude, slope, exposure
 - distance roads, buildings, water, salt
 - stocking rate (LU*month/ha)



- Factors influencing pasture use and stocking rate
- Comparison of actual use with advised management of each pasture type

1) Farming systems and farmers' opinions



Production system

Similar livestock **management** and technical **performance** to neighbouring valleys except for:

- High **pluriactivity index** (60%)
summer & winter tourism
- Increasing role of **winter transhumance**
reduces purchased feedstuffs
releases workforce



Farmers' opinions

Environment



Effect of the ski resort and tourism



- Grazing = environmental **benefit**
- Ski resort positive for their circumstances **diversification + collaboration**



2) Use of space by cattle

- Livestock used **64% total area** (190 ha)
stocking rate of 0.646 LU*month/ha
globally adjusted to pasture offer
- They **rejected 36%** of the area:
 - areas of lower
pastoral value
 - at higher altitude
 - with higher slope
 - farther from salt areas
& infrastructures
 - not limited by distance
from water



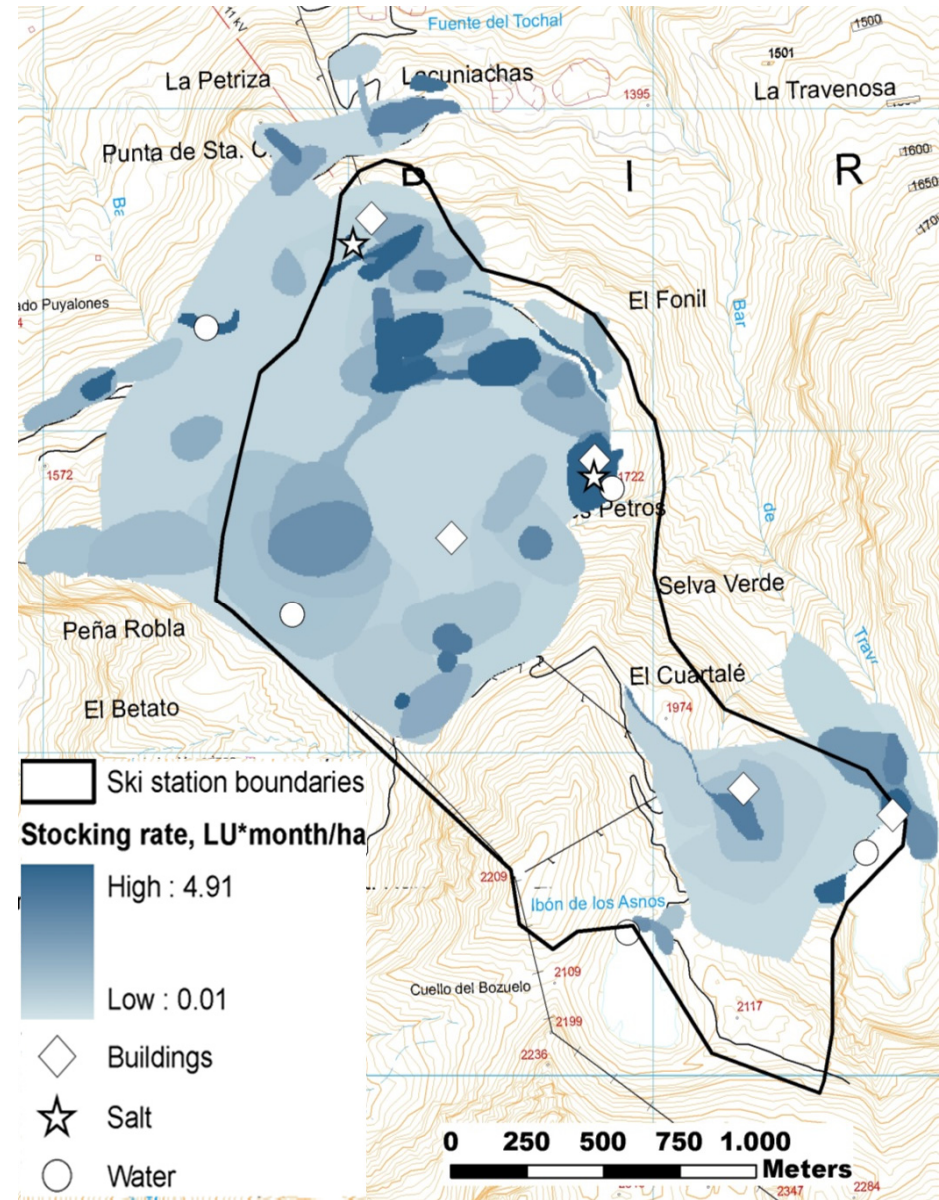
- Within grazed areas **cattle distribution** was not homogeneous:

stocking rate related to **pasture type & characteristics**

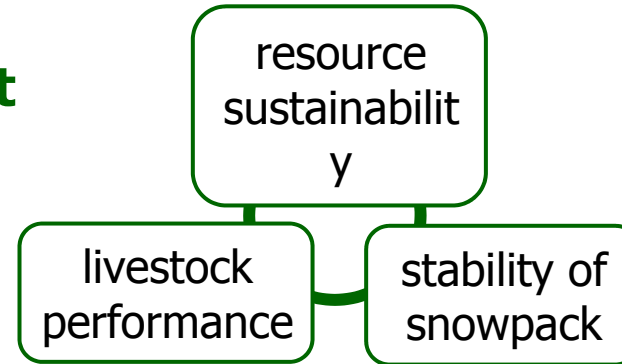
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Altitude	-0.38
Distance to salt	-0.35
Distance to buildings	-0.34
Distance to roads	-0.32
Slope	-0.23

natural & anthropic

- Preferences and stocking rates changed throughout the **grazing season**



- **Actual use vs. advised management** for each pasture type



Adequate

- *Bromion erecti* : start & end of grazing season
- *Festucion eskiae* & *F. gautieri* : naturally avoided - prevents erosion

Not Adequate

- *Primulion*: short grazing period
- *Nardion*: low stocking rate - refusals
- Hygronitrophylous past. by water troughs

Proposals

- salt in target areas
- restrict access to others
- water troughs in steep areas

- *modify temporal & spatial management*
- *provide or improve infrastructures*



Conclusions

- The provision of ES by cattle grazing on a ski station could be enhanced by modifying animal management and providing infrastructures.
- Farmers considered that the ski station was beneficial for the valley economy and that reciprocally it profited from livestock grazing. They were prone to implement the suggested management correction measures.

Synergies between both activities can be strengthened

