



A prospective study of the impacts of protective strategies for livestock farms facing the coming back of wolves (Massif Central, France)

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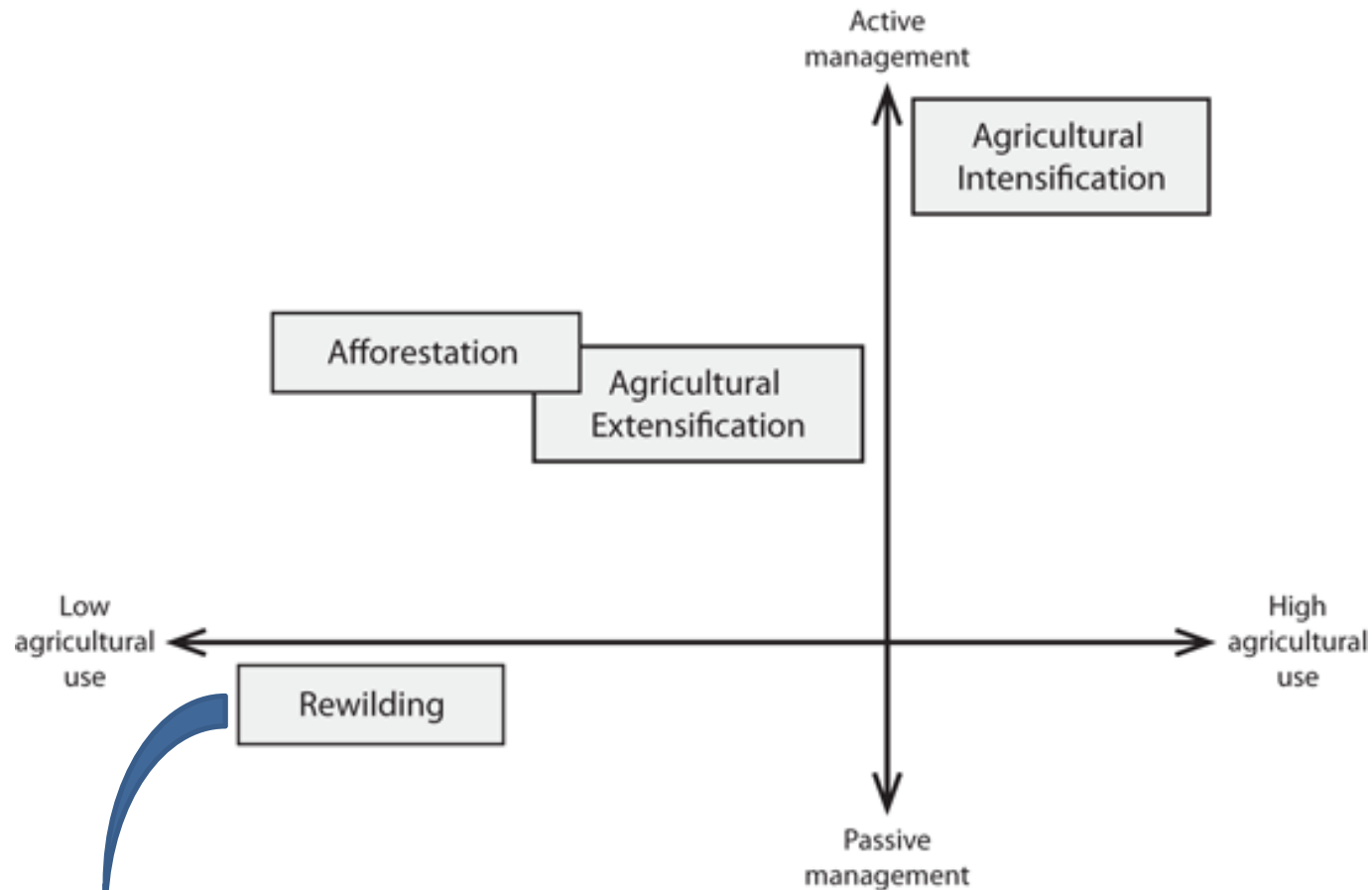
The landscapes of many mountain areas are the results of human practices and activities linked with livestock



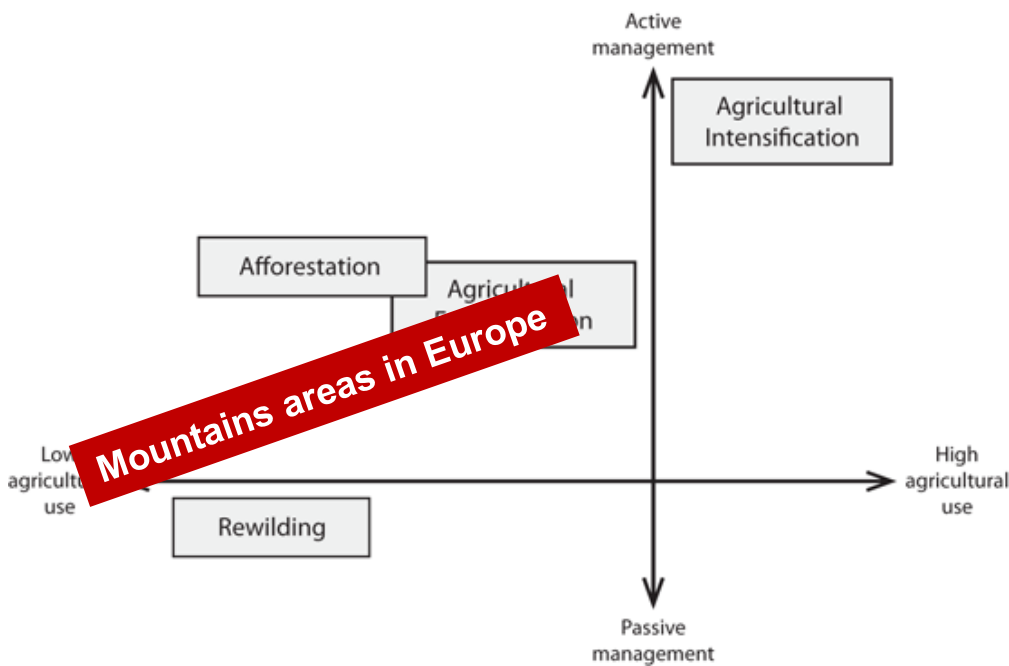
Rewilding ?

Four landscape management strategies

(Navarro and Pereira, 2015)



Rewilding abandoned landscapes : natural regeneration of forests and other natural habitats through passive management approaches



*Several management
in the same area*

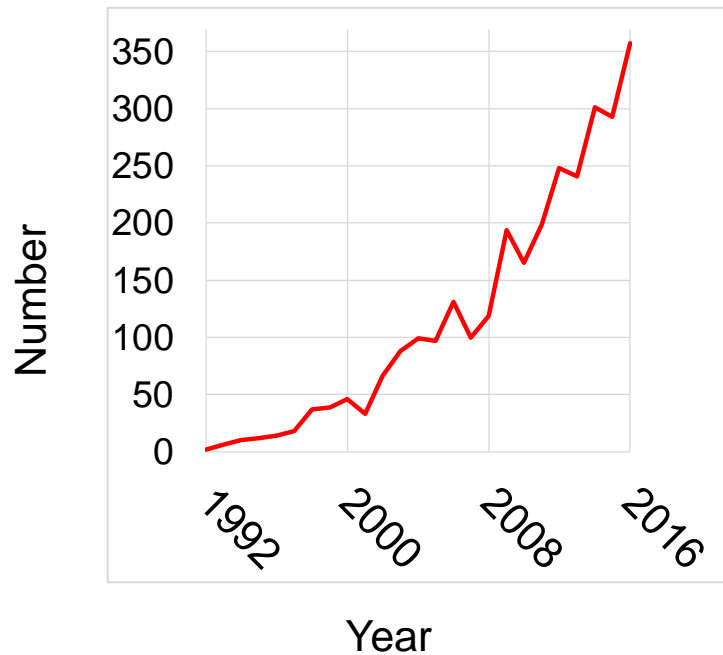
Rewilding of some components of the agro-ecosystems may impact the farmers' practices and decrease the economic viability of their farms

Landscape and life quality could be affected

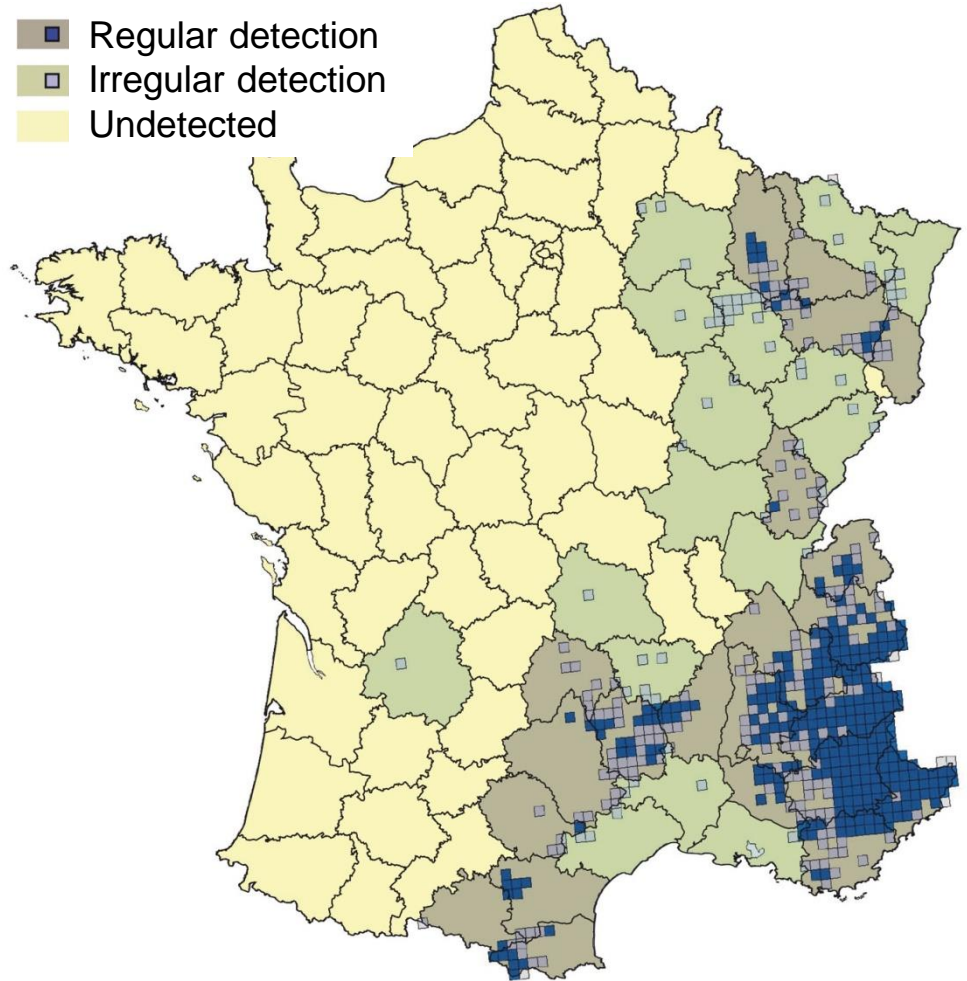
Evidence from the study case of the **come back of wolves** in the south of *Massif Central* in France?

The come back of the wolves in France, since 1992

Estimation of wolves number (1992-2016)



Spatial repartition of the detection of wolves (2016)



In Meuret et al., 2017

Data : Wolf-Lynx Network of ONCFS

A strict protection status for the wolves

Texts about the protection of wolves in France

- Bern Convention (ratified by France, 1989)
- Habitats Directive") EEC 92/43
- French Environment Code (L.411-1, L.411-2 and R.411-1 to R.411-5)

Are banned : all forms of possession, capture, intentional killing, intentional disturbance and trade in specimens taken from the wild of wildlife species, including wolves.

Exceptions to these prohibitions if:

- maintenance, at a favourable conservation status, of the wolf population
- predefined framework justifying an interest in taking action “to prevent significant damage to livestock farming”
- no other satisfactory solution

Illegal destruction of a wolf:

- two years' imprisonment and a fine of 150.000 €.

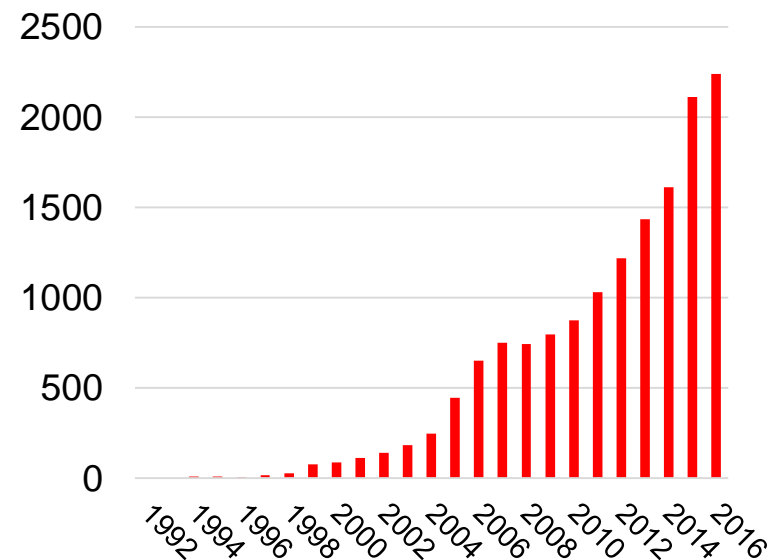
National Wolf Plan

- Payment for damages, if the wolf predation is recognized
- Subsidies for the protection of the livestock farm

Protective measures

- assistant shepherd
- livestock guard dog
- electrified night pen

Number of farms adopting herd protective measures
against wolf attacks (France)



*In Meuret et al., 2017
Data : DRAAF Rhône-Alpes*

2014: wolves detected in Aveyron

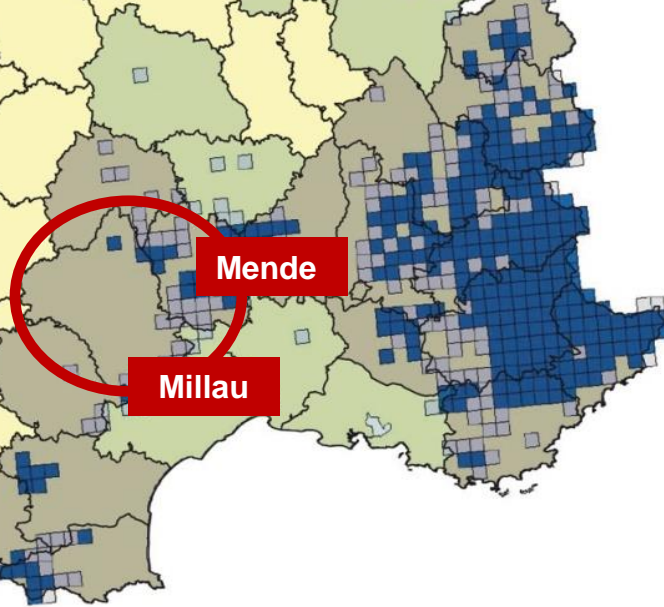


Photo: PNR Grands Causses

Landscape of the *Larzac* plateau



Photo: INRA

A flock in a clearing on the *Causse Noir*

Mende

Millau

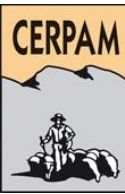
Wolves detected in
South Aveyron



Evolutionary cultural landscape of Mediterranean agropastoralism
in Causses-Cévennes
recognized as **World Heritage**



A prospective study on protection strategies of sheep farms in South Aveyron



Réseau de chercheurs
COADAPHT



L'adoption des moyens de
protection des troupeaux sur le
territoire des Grands Causses
permettrait-elle aux systèmes
d'élevage ovins de rester viables
face à l'arrivée des loups ?

Marie-Odile Nozières-Petit
Jérémy Weller
Laurent Garde
Michel Meuret
Charles-Henri Moulin

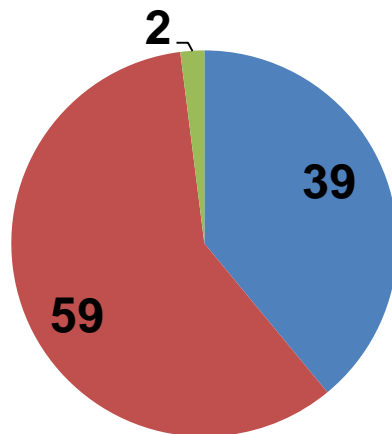
Photo : www.gregalric.com
Crédit photo : OT Larzac et Vallées

Octobre 2017

The study area

South-East of Aveyron
45 municipalities

Total area: 1,800 km²



- Agricultural land
- Forest and semi-natural environments
- Artificialized land

The study area

South-East of Aveyron
45 municipalities

Total area: 1,800 km²

679 farms

90 000 ha of agricultural lands

10 % cereals (grain and straw for livestock)

90 % grasslands (permanent or cultivated)

315 sheep flocks with more than 100
reproductive animals

- 136,000 dairy ewes, producing milk for the **Roquefort cheese** processing, with PDO - Protected Designation of Origin
- 21,000 suckling ewes



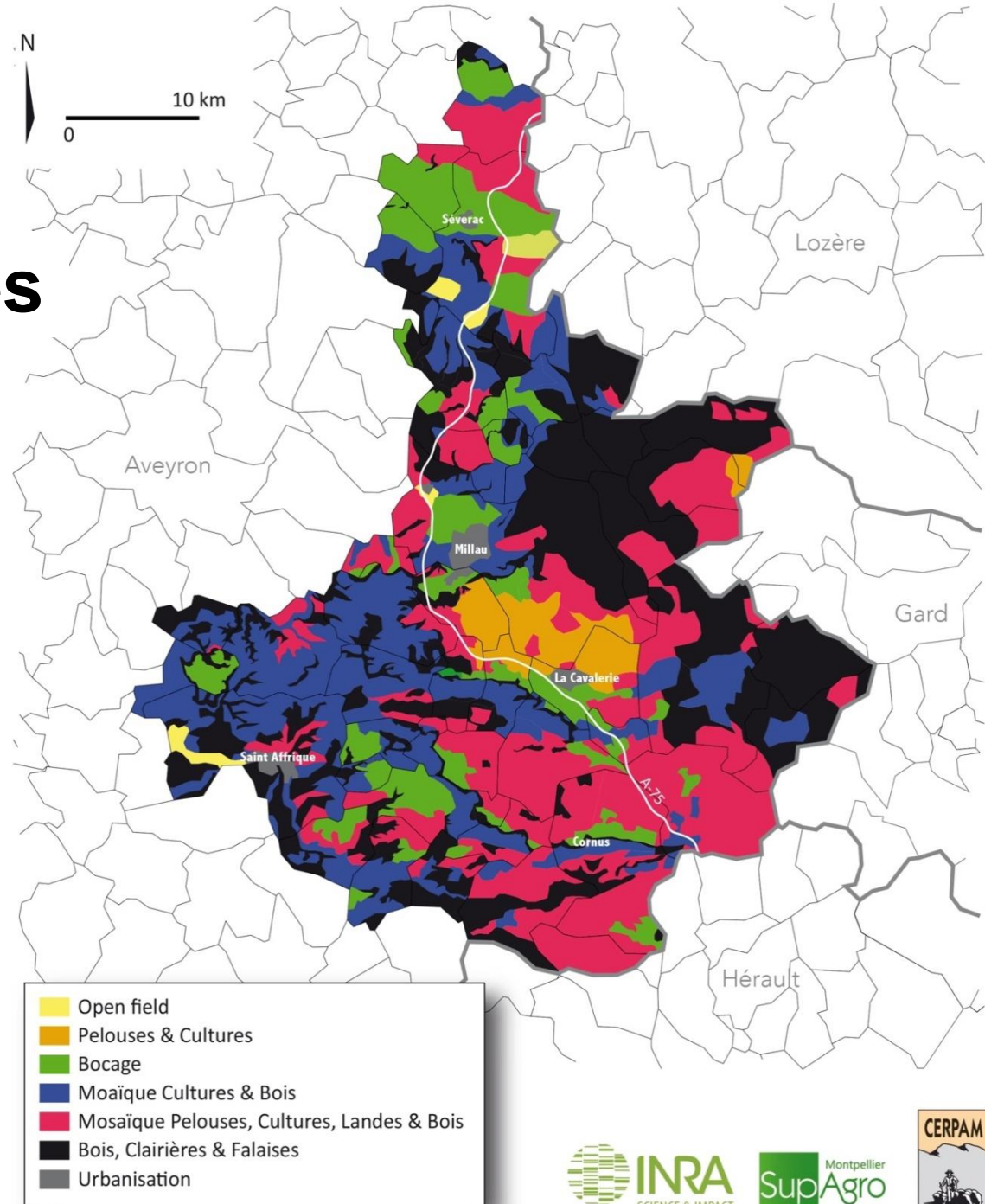
Six landscape types



- Open field
- Pelouses & Cultures
- Bocage
- Moaïque Cultures & Bois
- Mosaïque Pelouses, Cultures, Landes & Bois
- Bois, Clairières & Falaises

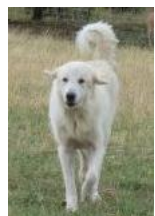
Six landscape types

No significant portion of the area can be considered as little exposed to the risk of predation by wolves

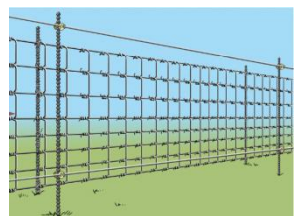


Chosen protective measures for prospective

Rangelands



+



Fixed electric fences (5 wires)
Maximum size of the pen: 25 ha

2 or 3

Grasslands



2 or 3

+



Mobile electric nets
(1 to 5 ha)



Dairy flocks are managed in **several groups of animals**, in fenced pens, without shepherds

Daily return to shed for milking and housing

	Jan	Feb	Mar	Apr	Mai	Jun	Jul	Aut	Sep	Oct	Nov	Dec
Culled and open ewes												
Rams												
Ewe-lambs												
Dairy ewes												



Grazing on grasslands



Grazing on rangelands

Three protective strategies

Protective strategy =

- modification of the flock and plots management
- protective measures to protect the grazing groups of animal

PS1 – Current managament

- **No** modification of the flock and plots management

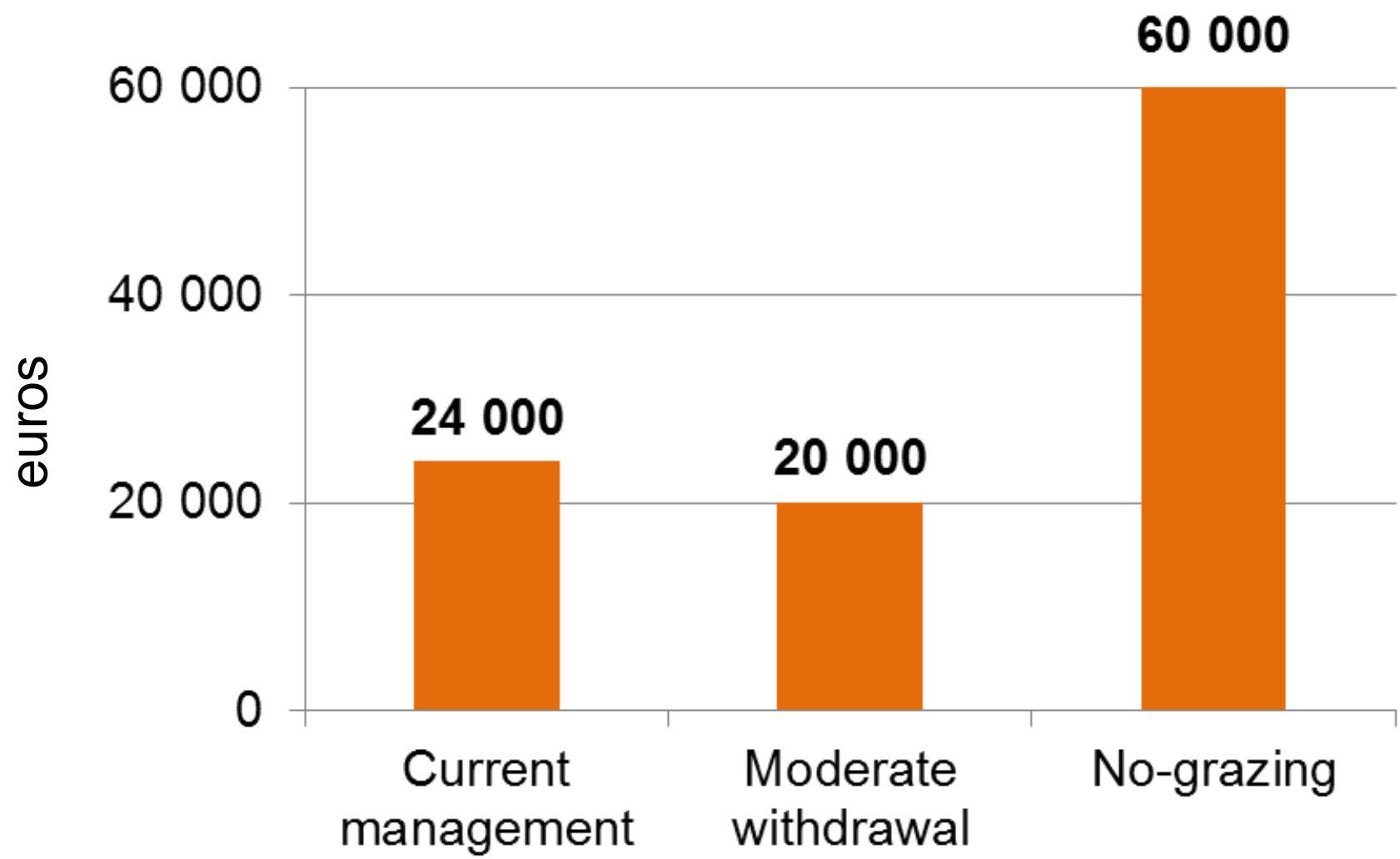
PS2 – Moderate withdrawal

- Some groups are kept in shed and some plots are no more grazed

PS3 – No-grazing

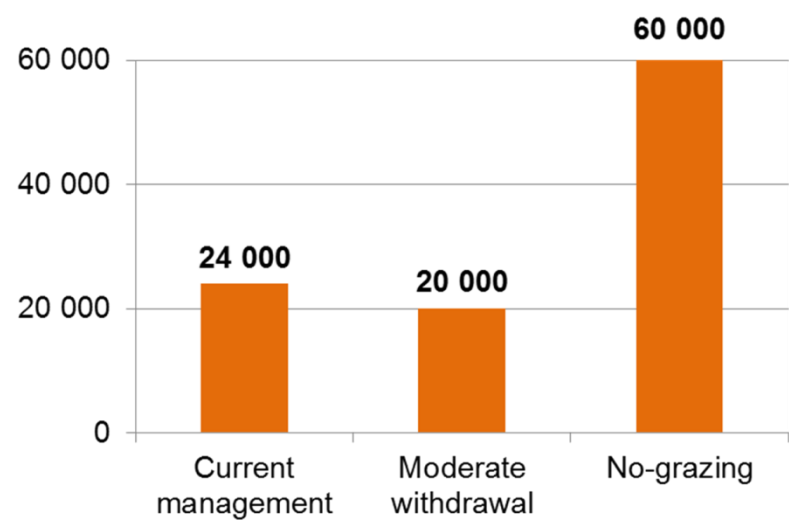
- All groups are kept in shed

Annual cost of the protective strategies per farm

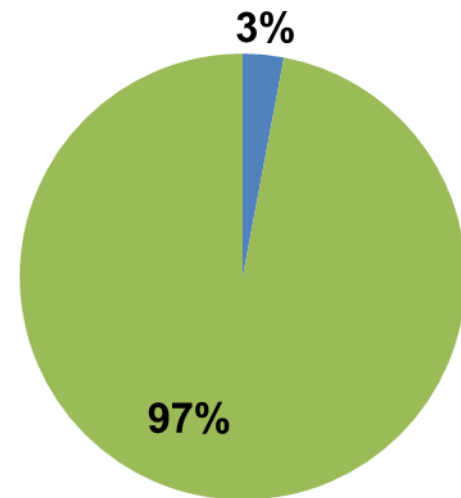
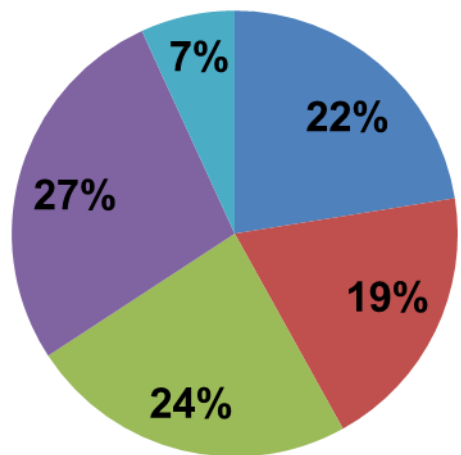
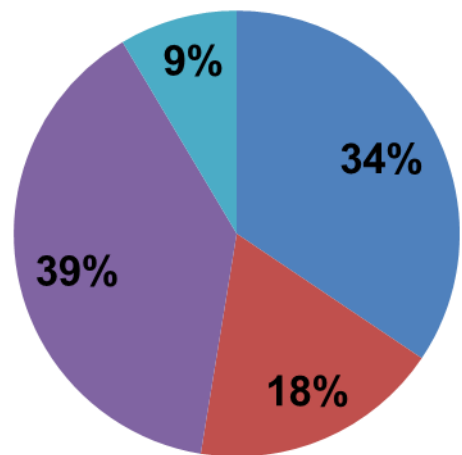


Cost calculation taking into account equipment depreciation, additional operating expenses related to protection and to modification of management, and loss of products or subsidies

Annual cost of the protective strategies per farm



	fixed fences	
	mobile nets	
	dogs	
	wages	
	management changes	

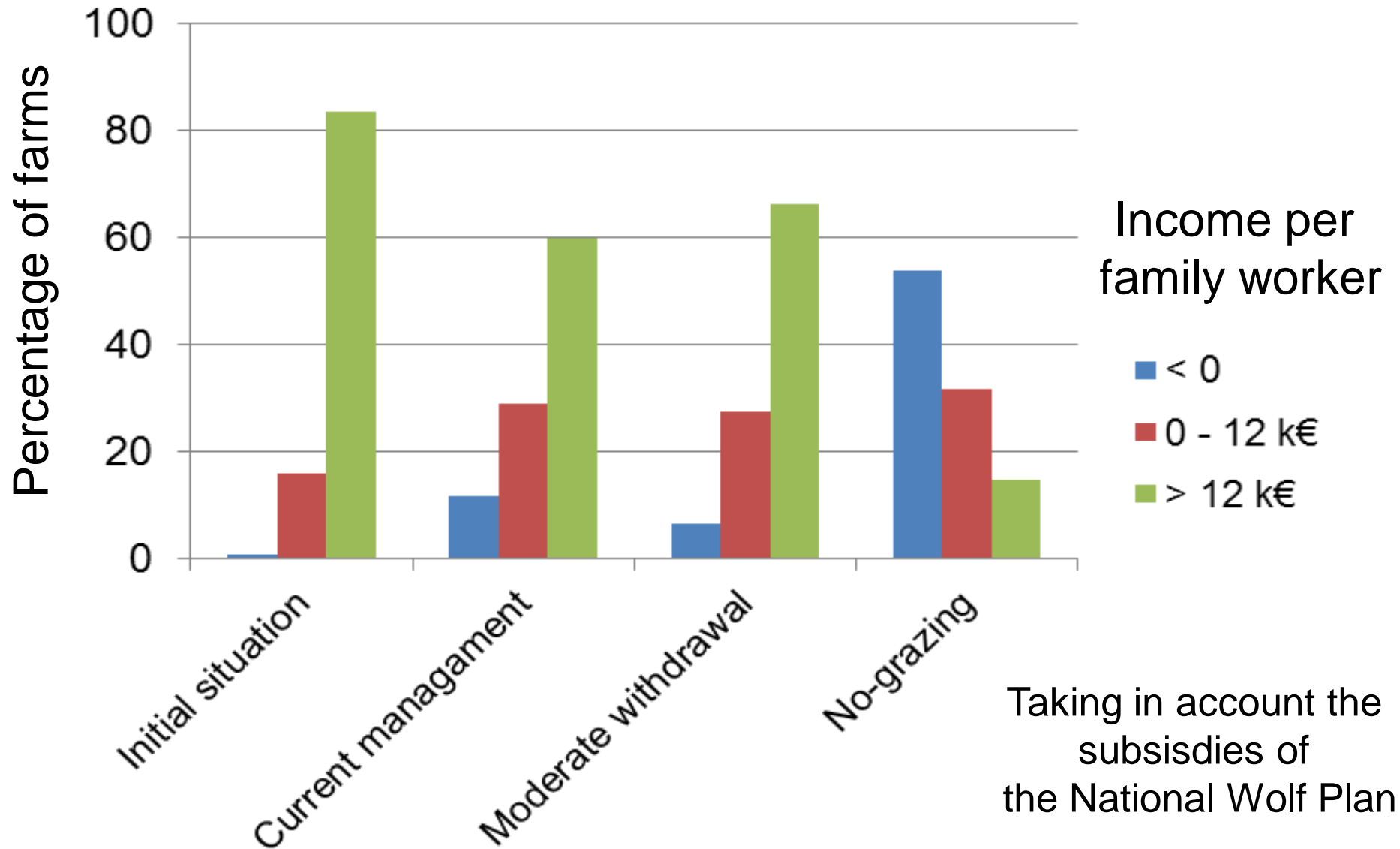


Current management

Moderate withdrawal

No-grazing

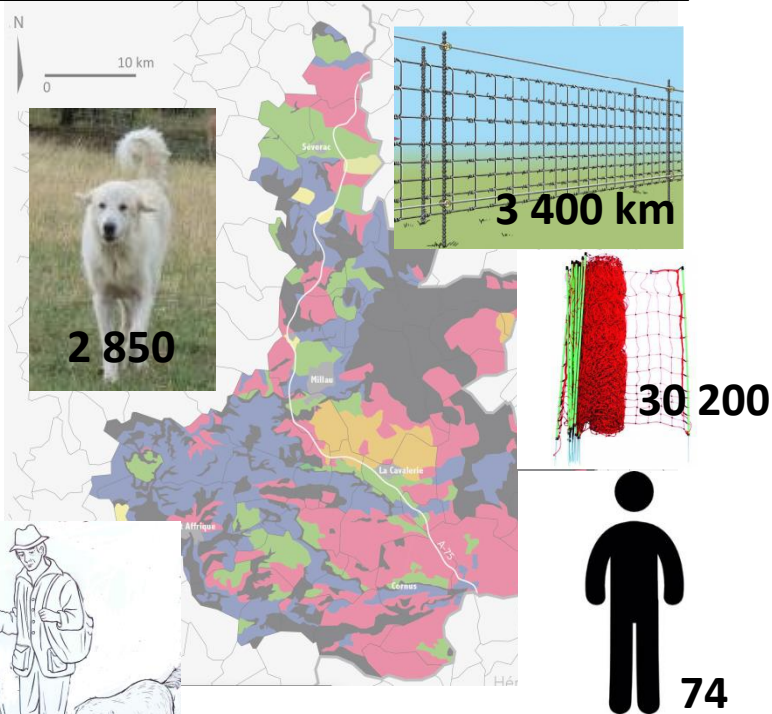
Economic viability of the dairy sheep farms according to the protective strategies



Protective means and work to engage at the area scale

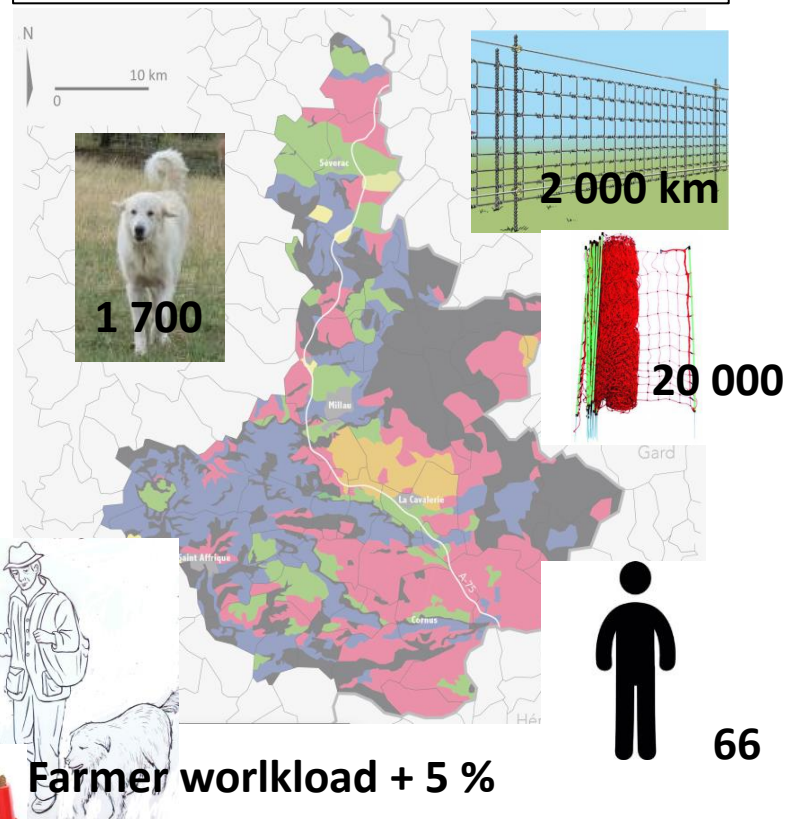
315 sheep farms, more than 100 heads

Current management



Farmer workload + 5 %

Moderate withdrawal

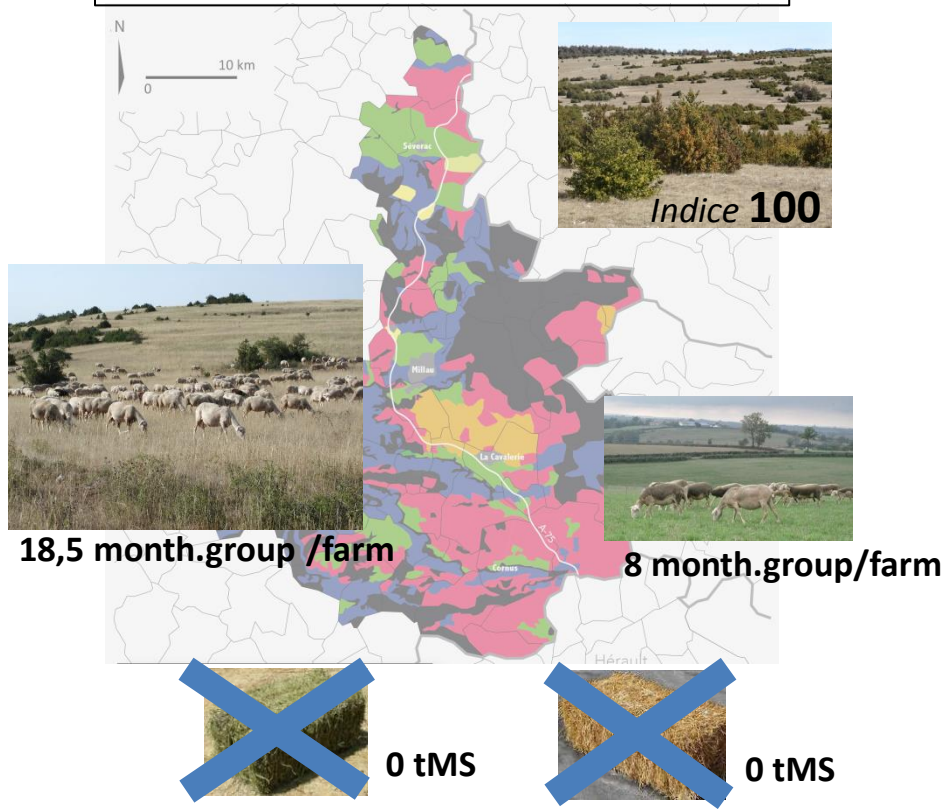


Farmer workload + 5 %

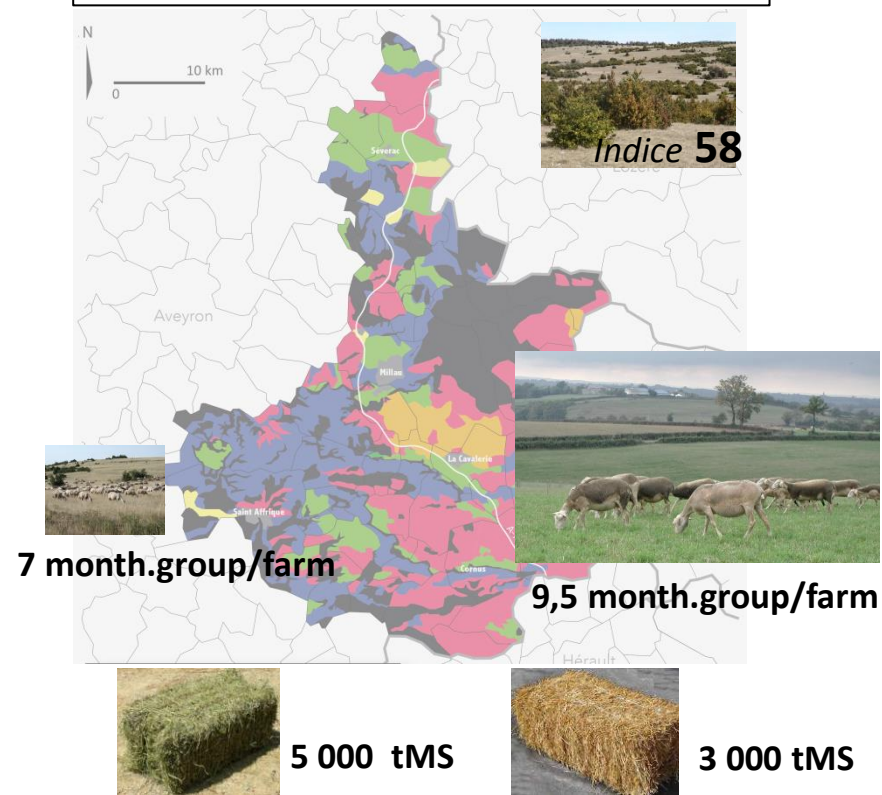
Land use and purchase of fodder and straw at the area scale

315 sheep farms, more than 100 heads

Current management



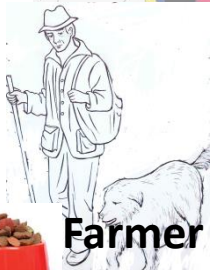
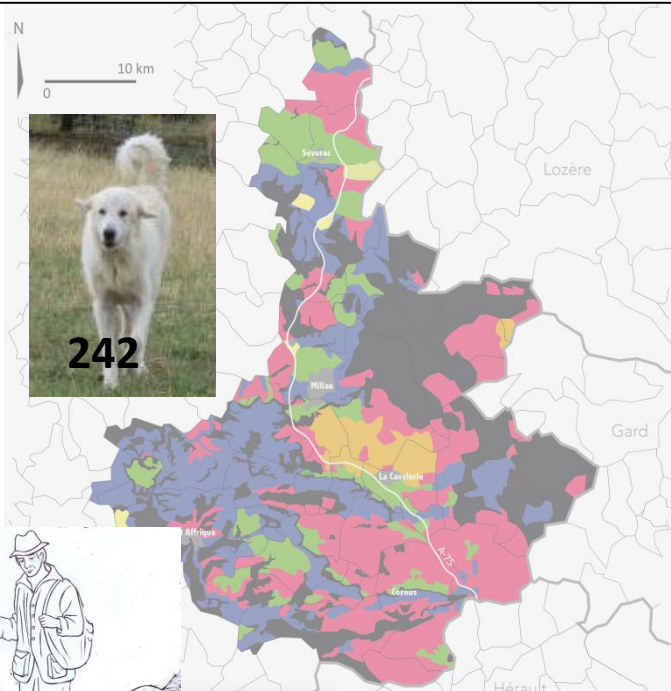
Moderate withdrawal



Protective means, work, land use and purchase at the area scale

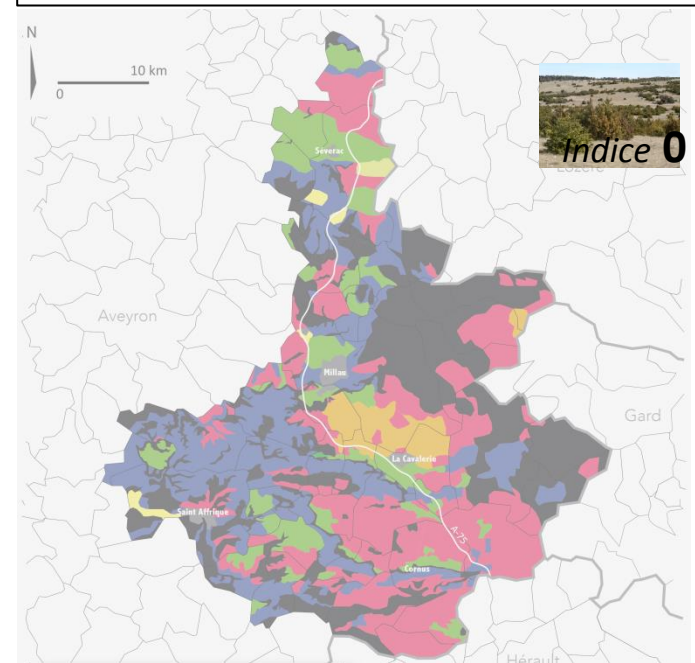
242 dairy sheep farms, more than 100 heads

No-grazing



Farmer workload + 5 %

No-grazing



41 100 tMS



10 000 tMS

Ewe milk no more useable for Roquefort cheese processing

Consequence of the **Protective Strategy Current Management** on the landscape and uses of land

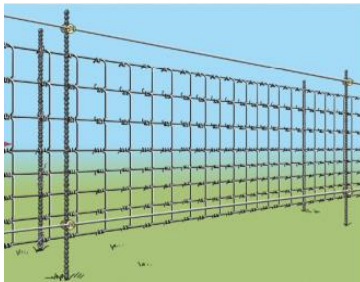
Study area

45 municipalities

Total area: 1,800 km²



2 850



3 400 km

Rangeland use with
a grid of fixed fences
(max: 25 ha per pen)

⇒ **Wild fauna**: on cultivated land, more damages to crops

⇒ **Hunting** : difficulty with the grid of fences and dogs

⇒ **Activites in nature** (walk, horse trek, picking...): difficulty with the grid of fences and dogs

- for tourists, with less attractiveness of the area and impact on touristic activities
- for local inhabitants

Consequence of the **Protective Strategy No-Grazing** on the landscape and uses of land

No more rangeland use by domesticated flocks

Would reinforce the dynamics of the vegetation and the encroachment with shrubs and trees

- trivialization of the landscapes,
- loss of their patrimonial value
- loss of the biodiversity linked to the open vegetation



Intensification of cultivated lands to produce stored forages (hay, silage)
Standard meat and milk from indoor husbandry



Conclusion

Whatever the protective strategies, the rewilding, through the come back of wolves, in a status of complete protection, would have large consequences on landscape and life quality

Many semi-mountain landscape, with livestock activities based on the grazing of several groups in animal in fenced pens, would be impacted



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Thanks for your attention