



LEARNING AREA « Causses et Cévennes » (France)

A BASELINE ASSESSMENT

Authors:

RODRIGUEZ Thibaut - Conservatoire d'espaces naturels Languedoc Roussillon

GIRARDIN Sébastien - Conservatoire d'espaces naturels Languedoc Roussillon

NOEL Lucie - Conservatoire d'espaces naturels Languedoc Roussillon

CAZALS Catherine - Entente interdépartementale des Causses et des Cévennes

Date: July 2017



This project has received funding from the European Union Horizon 2020 research and innovations program under Grant Agreement No. 696391

The area Causses & Cevennes

A portrait



Picture source : Cevennes National Park

Largest context

➤ South-West European territory

Cultural Mediterranean landscapes diversity made by agropastoral activities

Learning area to test preservation and management policies

➤ Mediterranean region representative of a lot of types of pastoral organization

➤ South-East of Massif Central

Low mountain range

In the middle of big transhumance trails between plains of Languedoc and Massif Central

➤ Eligible for Mountain Law (*Convention Interregionale du Massif Central 2015-2020*)



Perimeter of the LA

UNESCO territory

Core zone

≈ 3000 km²

Total zone

≈ 6000 km²

Source : UNESCO Candidature



The Universal Exceptional Value of the Causses and Cevennes is characterized by landscapes shaped by agropastoral activities.

The territories within the Causses and Cevennes UNESCO perimeter, are the most significant examples of agropastoralist landscapes (geological and morphological criteria, landscape unity, cultural elements, rangelands and summer pastures). The area has a strong historical identity and benefits from a complete set of protective and management measures.

The reasons for enrolling in UNESCO:

The permanence of the cultural landscapes (transhumance trails, rangelands, sheepfolds) even though some (terraces, the hydraulic system) are already relics.

Agropastoralism, the combination of extensive livestock breeding and cultivation of forage crops has always succeeded in keeping the land open.

The cultural traditions are based on social structures and breeding that are adapted to the environmental constraints.

The Causses and Cevennes is a singular example of a Mediterranean basin, and is a cultural engagement for France.

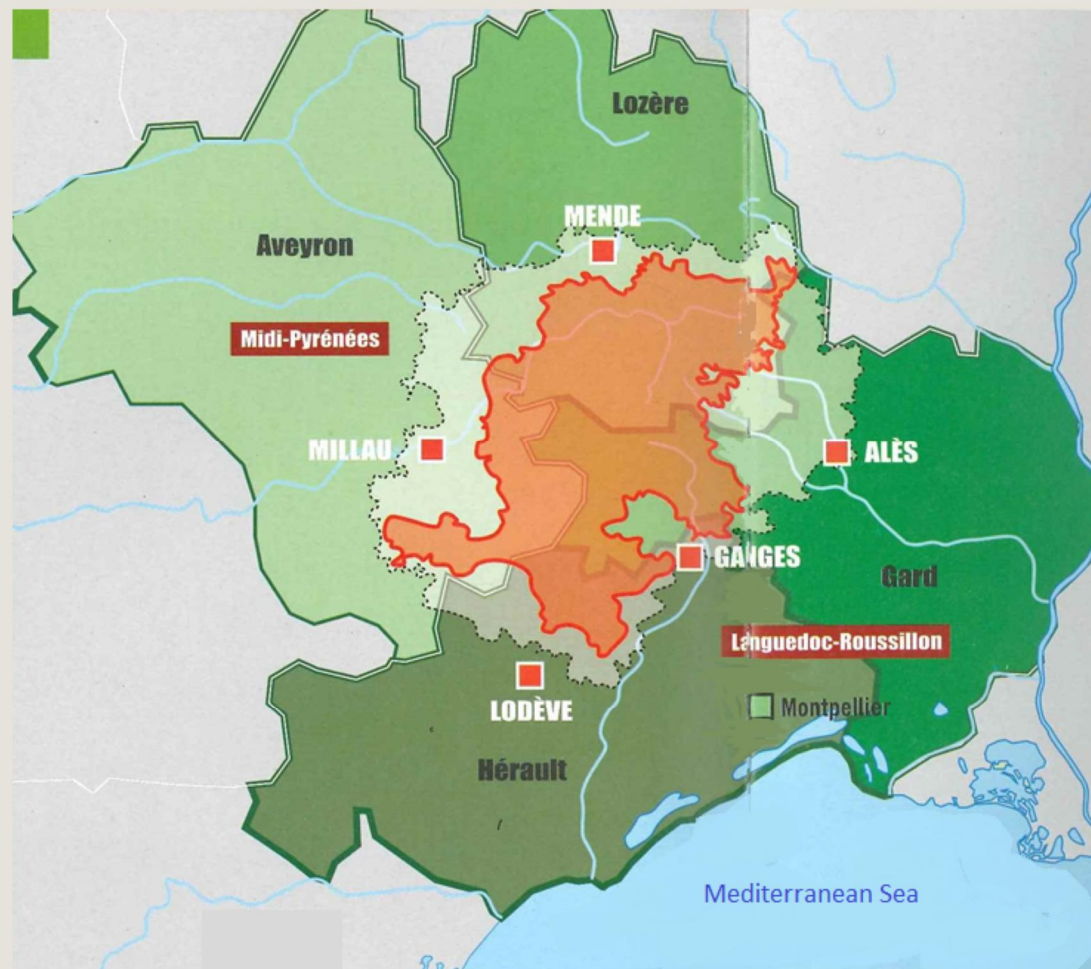
Agropastoralism has long characterized the Causses and Cevennes and the same pastoral practices continue to be used today, unlike in other countries in southern Europe where such practices seem to be disappearing due to changes in farming systems and to the rural exodus. In the the Causses and Cevennes, transhumance trails continue to mark transhumance territories today.

The Causses and Cevennes perimeter is to be a Learning Area in the HNV-Link project based on several features:

- **An innovative institutional framework** thanks to the creation of the interdepartmental agreement for the management of the Causses and Cevennes area (UNESCO).
- **Targeted agro-ecosystem and tailored agro-ecological management** (landscape ecology) linked with the actions outlined in the 2015-2021 Management Plan.
- **A management structure with several actors:** State services, local authorities, professional organizations,

technical support services, research institutes and associations.

Administrative limits



1 region (*Occitanie-Pyrenees Mediterranee*).

The Causses and Cevennes area is shared by **4 French administrative departments**: Lozere (44% of communes), Gard (28%), Aveyron (16%), Herault (12%).

Three thousand square kilometers of the area proposed for addition to the World Heritage list (the « core zone ») is made up of 123 communes.

A total of 215 communes and 6,000 km² of highlands in the southern Massif Central turned toward the Mediterranean

5 « gateway » towns: Ales, Ganges, Lodeve, Mende, Millau

8 Groups of communes (*communaute de communes* in French)

The Causses and Cevennes UNESCO territory is divided into three zones:

- **the core zone** (communes located entirely inside the core zone),
- **the core-buffer zone** (communes with part of their territory located in the core zone)
- **the buffer zone** (92 communes) located in the immediate vicinity of the core-buffer zone.

(Source AGRESTE Languedoc-Roussillon – *Donnees septembre 2013*).

The Learning Area in the HNV-Link project corresponds to the core and core-buffer zone of the UNESCO territory. It is the largest landscape unit on the World Heritage List in Europe.

Presentation of the 3 territorial subunits

One territory but 3 different geographical and geological areas:

► Causses (limestone plateau)

Causse de Sauveterre, Causse Mejean, Causse Noir, Causse du Larzac + Gorges (Tarn, Jonte, Dourbie, Vis, etc.

Flat land with shallow porous soils.

► High Cevennes

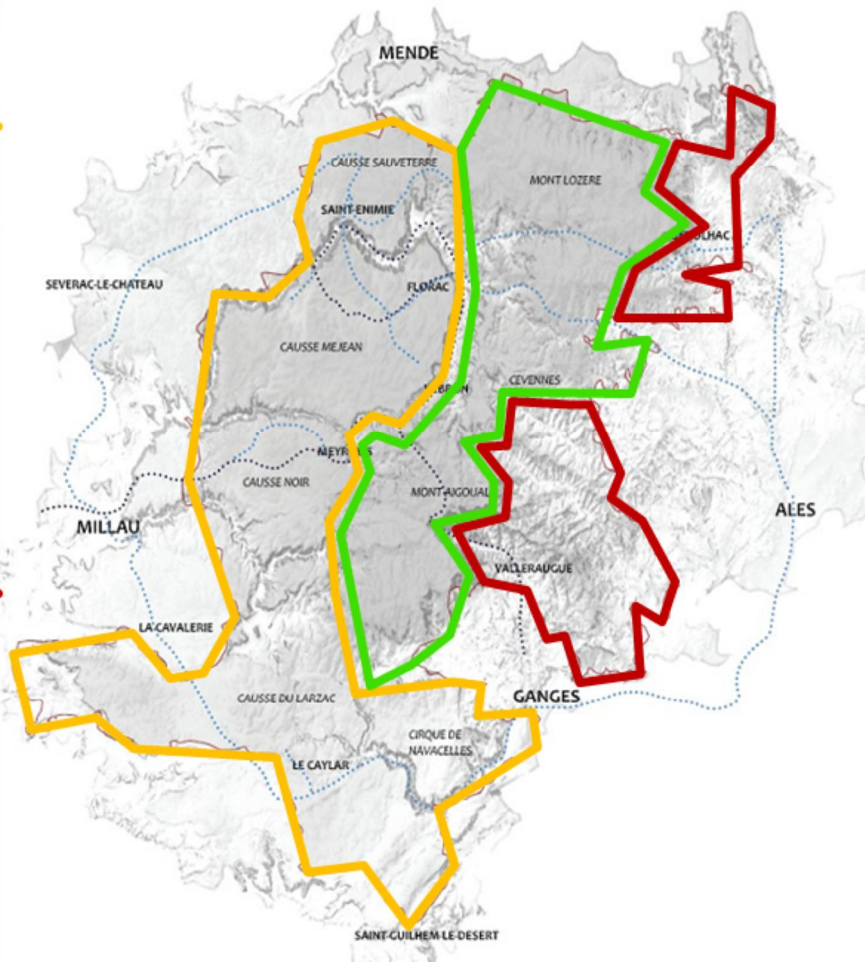
Mount Lozere, Bouges, Mount Aigoual, Lingas: granite massifs

+ Cans (small limestone plateau)

► Cevennes crests and valleys

Vallee des Gardons, Vallee Longue, Vallee Française, Vallee Borgne, Vallee de l'Herault, Hautes vallees de la Ceze et du Luech

Shallow sale soils, steep landscapes, woodlands



The Causses and Cevennes form a territorial unit comprised of 3 different subunits:

Causses and Gorges: The Causses is a vast limestone plateau situated at an altitude of around 1,000 m asl, and surrounded by gorges and cliffs. The plateau is crisscrossed by lanes linking villages, farms and the sparse arable land nestling in the hollows of vast rangelands.

The **High Cevennes** are characterized by 2 main massifs :

Mount Lozere in the north of the area, bordered by the Lot valley and the Altier valley in the north and by the Massif of Bouges in the south. Mount Lozere is the highest summit of the southern Massif Central.

Mount Aigoual-Lingas, in the south of the area

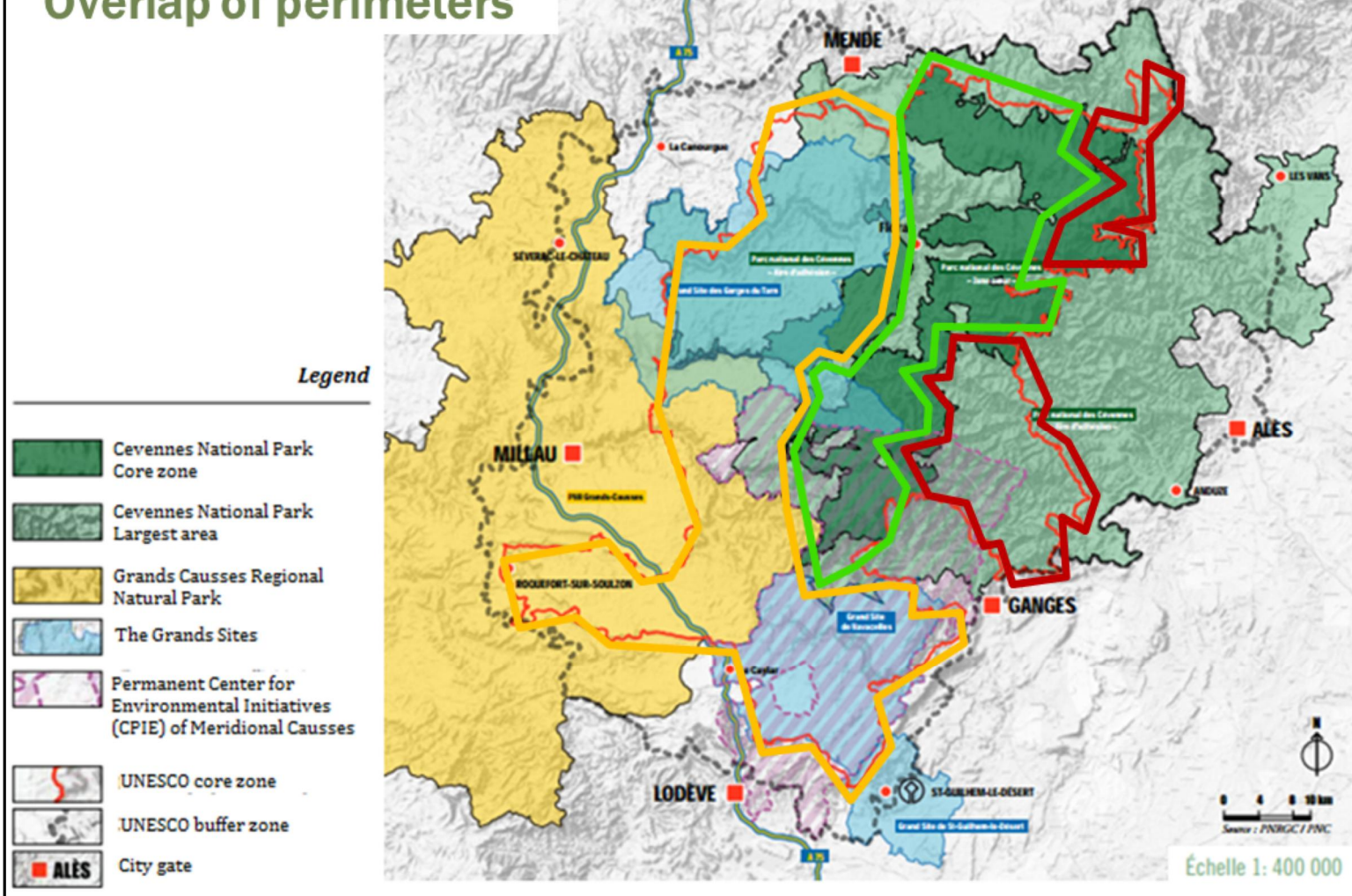
Cevennes crests and valleys in the eastern part of the area. The schist valleys are situated at an altitude of under 1,000 m asl, and are characterized by ridges and valleys. In some places, 95% of the land is on a slope.

The Causses and Cevennes is a mountain area with a relatively harsh (given that it is Mediterranean) climate (cold in winter, hot in summer) with summer droughts (more common in the southern part). The use of agricultural machinery is almost impossible on these arid shallow soils. Only pastoralism can flourish in such areas and counter invasion by broom, box trees, and spontaneous afforestation by pine or oak. Only man in synergy with animals, mainly sheep, are capable of preventing the transformation of the landscape (CGAER report).

Causses	Cevennes
Catholic	Protestant
Open landscape	Woodlands
Ease of travel (increased with A75)	Enclosing cevennes valleys
Large agricultural structures	Little farms (except summer lands in the top)

Overlap of perimeters

Source : UNESCO Candidature



Recent events and key dates around the question of agropastoralism in the territory:

Many protective measures apply to the Causses and Cévennes Site and management is divided between various operational bodies each of which operates in its own territory:

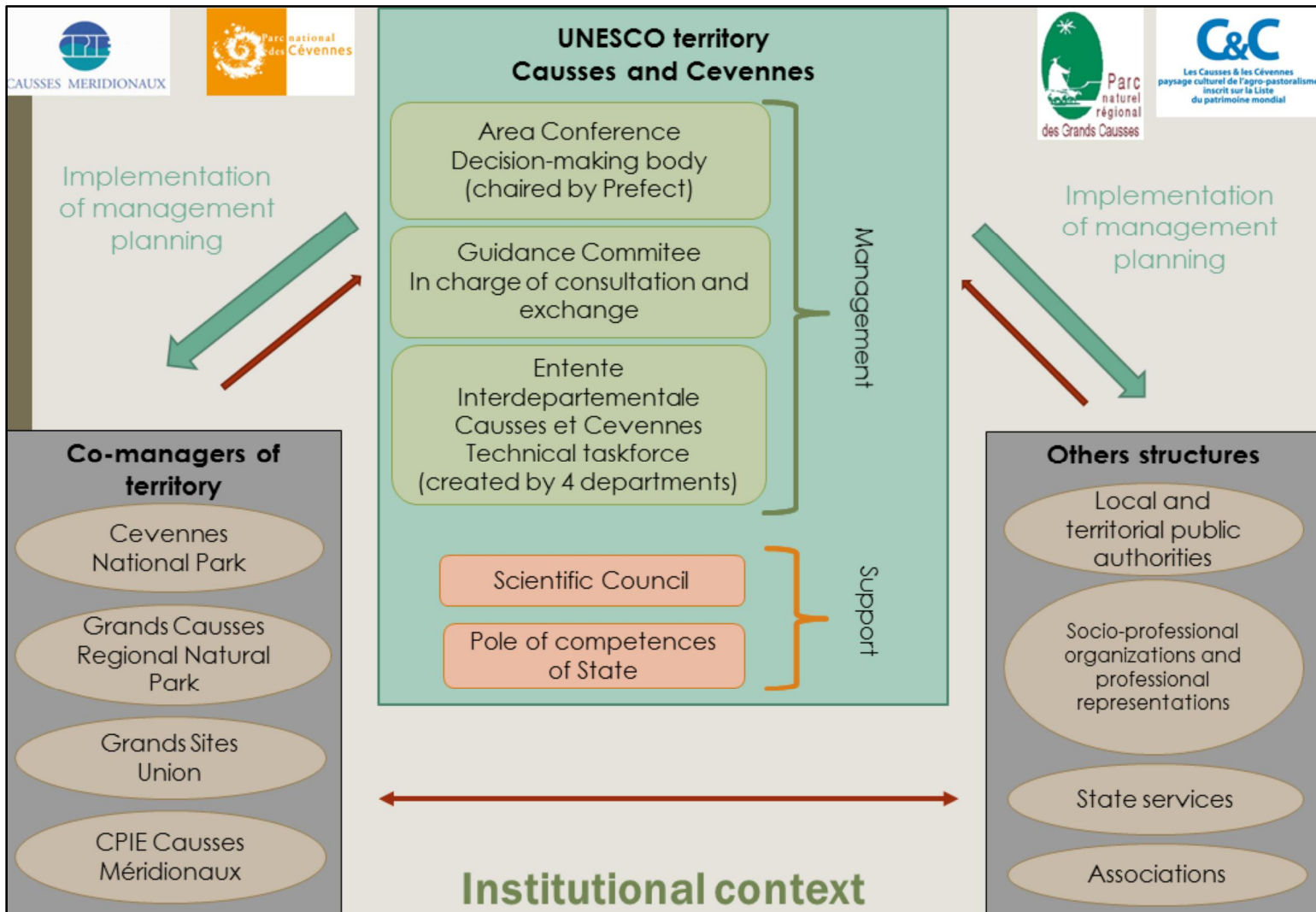
- **The Cévennes National Park**, a public institution including 117 communes on 321,380 hectares was created in September 1970; it is the only permanently inhabited National Park in France. It has also been a biosphere reserve since 1985.
- **The Causses Meridionaux association** was created in April 1994. The Permanent Center for Environmental Initiatives (French acronym CPIE) comprises 28 communes in the Departments of Gard and Herault. The association was certified in 2002. This Center undertakes actions in favor of sustainable development in two areas:
 - Aiding territories through public policies
 - Awareness raising and education of the general population concerning the environment.
- **The Regional Nature Reserve of Grands Causses** (French acronym PNRGC) concerns 94 communes and 315,949 hectares. It was created in 1995 and is managed by an association of local authorities.
- **The Tarn Gorges and Jonte sites** were extended on March 29, 2002, and now cover nearly 29,000 ha. They are classified as protected sites (French Law of 1930 for "The protection of natural monuments and sites of artistic, historic, legendary or picturesque character"). These sites are world famous; most have "three stars" in tourist guidebooks. In our area, there are 3 such sites: (i) Gorges du Tarn, de la Jonte et des Causses, (ii) Cirque de Navacelles and (iii) Saint-Guilhem le Desert, gorge de l'Herault.

Although the "Grands Sites" are very different, they face similar challenges:

- The preservation and restoration of attractive but fragile landscapes
- The intelligent organization of the huge numbers of visitors who have to be managed and controlled
- Promoting the values of sustainable development

These challenges require active local management implemented by local organizations, such management is an indispensable complement to the regulations laid down by the state.

- **The Causses and Cévennes Site** was added to the World Heritage List, as a living cultural landscape of Mediterranean agropastoralism on June 28, 2011.
- **The governance of the Causses and Cévennes Site** was established in 2012 and the Prefect of Lozere was appointed Coordinating Prefect by the Prime Minister in January, 2013.
- **The Area Conference** approved the Causses and Cévennes 2015-2021 action plan in December 2015, and a public institution (CGAAR) submitted a report on the sustainability of extensive agropastoral practices in the Causses and Cévennes UNESCO territory in May 2016.



Context of the multidisciplinary governance of the Causses and Cévennes Site

After the Causses and Cévennes was added to the World Heritage List in June 2011, the State and the local authorities created a management body to guarantee the maintenance of the Outstanding Universal Value of the Site. Three authorities are involved in order of importance:

- **The Area Conference** was created on January 13, 2012, and is chaired by the Coordinating Prefect. It is the decision-making body and is responsible for defining the guiding principles for the management of the Site and authorizing actions that guarantee the Site will be well preserved.
- **The Guidance Committee** is the body in charge of consultation and exchange with all those involved locally, and is responsible for proposing guiding principles and recommendations for management of the Site. The committee comprises the Association for the Valorisation of the Causses and Cévennes (French acronym AVECC).
- **The Technical Taskforce:** (*Entente Interdepartementale*) for the Causses and Cévennes Site was created as a public institution on April 11, 2012 on the initiative of the four departments (Aveyron, Gard, Hérault, Lozère). Plus two support institutions: the Scientific Council and the Pole of Competence, which includes all French departments.

For the implementation of the Causses and Cévennes Action Plan, the technical taskforce is supported by the co-managers of the territory:

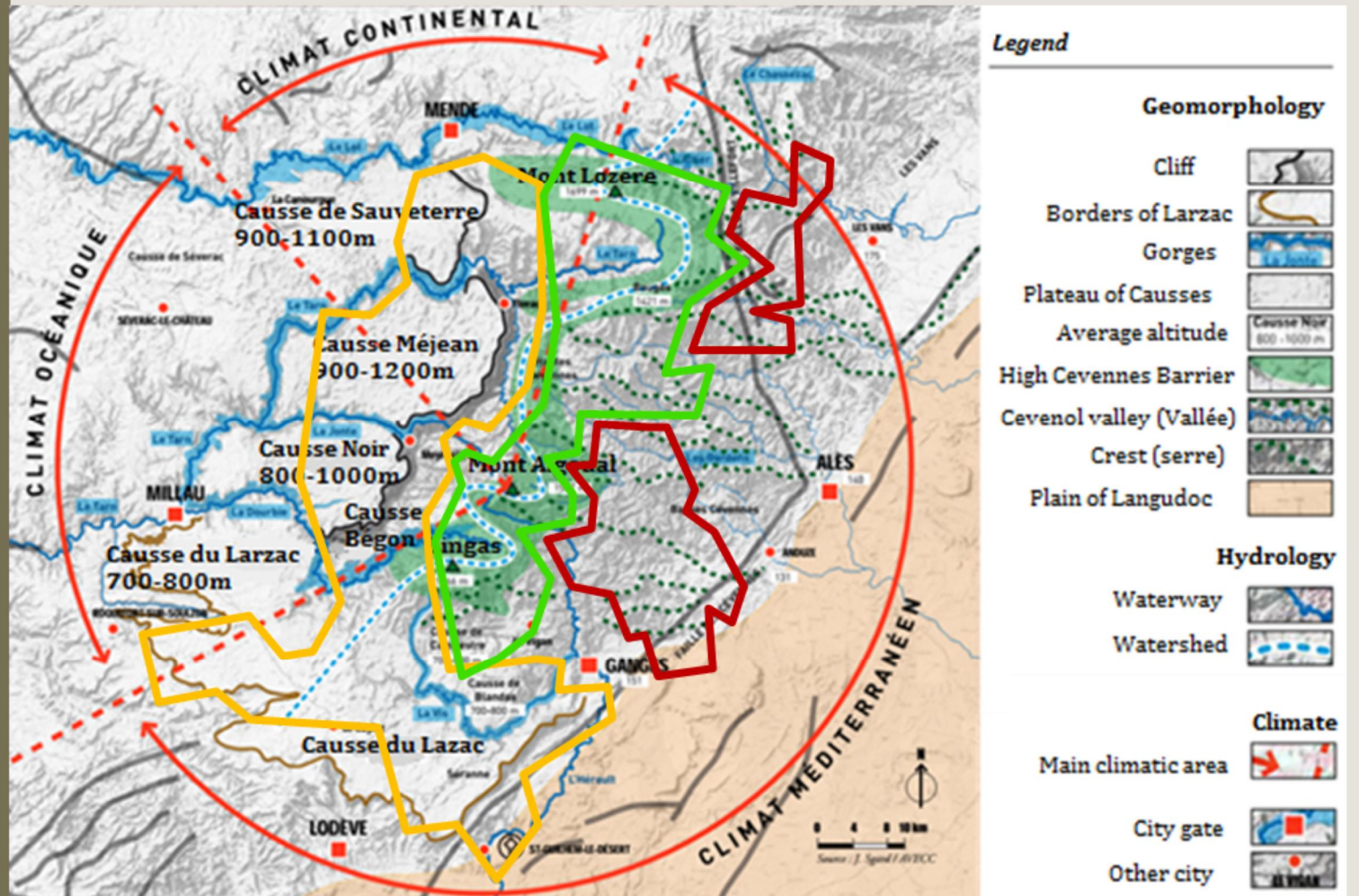
- the Cévennes National Park,
- the Grands Causses Regional Natural Park,
- the « Mixed Association » of the sites « Gorges du Tarn, de la Jonte et des Causses », « Cirque de Navacelles » and « Saint-Guilhem le Desert, gorge de l'Hérault »,
- the "Causses Méridionaux" association

And also by many institutions concerned with agro-pastoralism, namely:

- State services,
- public territorial authorities (The Region of Occitanie, the administrative departments) and local authorities (communities of communes, and communes, mixed associations),
- socio-professional organizations and professional representations ;
- the organizational bodies involved in Natura 2000;
- associations of a departmental nature and local associations.

Climate and geology

Source : UNESCO Candidature



Geology

The morphologic and pedological composition of the territory comprises 3 types of physical environments ranging from an altitude of 200 m and 1,700 m asl: a large limestone plateau, granite massifs and shale valleys (PnC 2010) (Duha 2011).

Climate

Like the geological characteristics, the climate differs with the subunits. The climate of the territory as a whole is Mediterranean, but some parts are influenced by a continental climate (in the north) or oceanic climate (in the west).

	Causses and Gorges	High Cévennes	Cévennes crests and valleys
Geology	Limestone plateau with deep canyons	Granitic massifs surrounded by schist and sandstone formations	Essentially shaly
Climate	Mediterranean climate. Causse Méjean and Causse of Sauveterre : under the influence of continental climate (mountain climate). Causse Noir, Causse of Larzac and Causse Bégon : under the influence of oceanic climate.	Mediterranean climate. Important variability of temperature, abundant precipitations and strong winds at the top.	Mediterranean climate with cold winters, dry and warm summers and rainy autumns but with mild temperatures.

Rainfall and temperatures

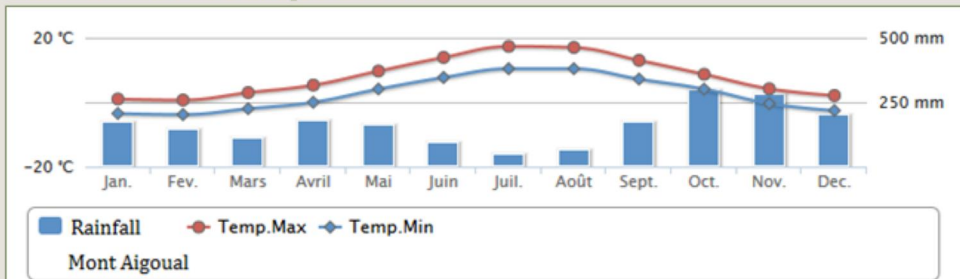


Diagram of climate on Mont Aigoual (average values) in 2016

<http://www.meteofrance.com/climat/france/mont-aigoual/30339001/normales>

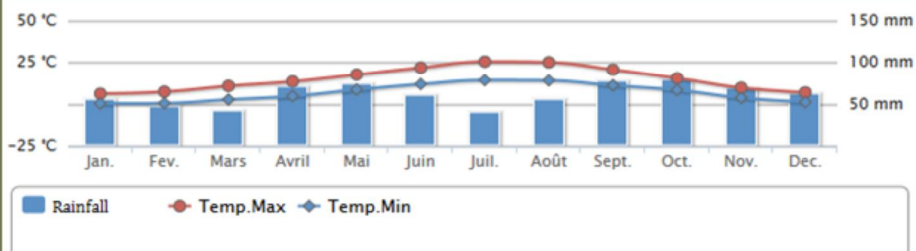


Diagram of climate on Millau (average values) in 2016

<http://www.meteofrance.com/climat/france/millau/12145001/normales>

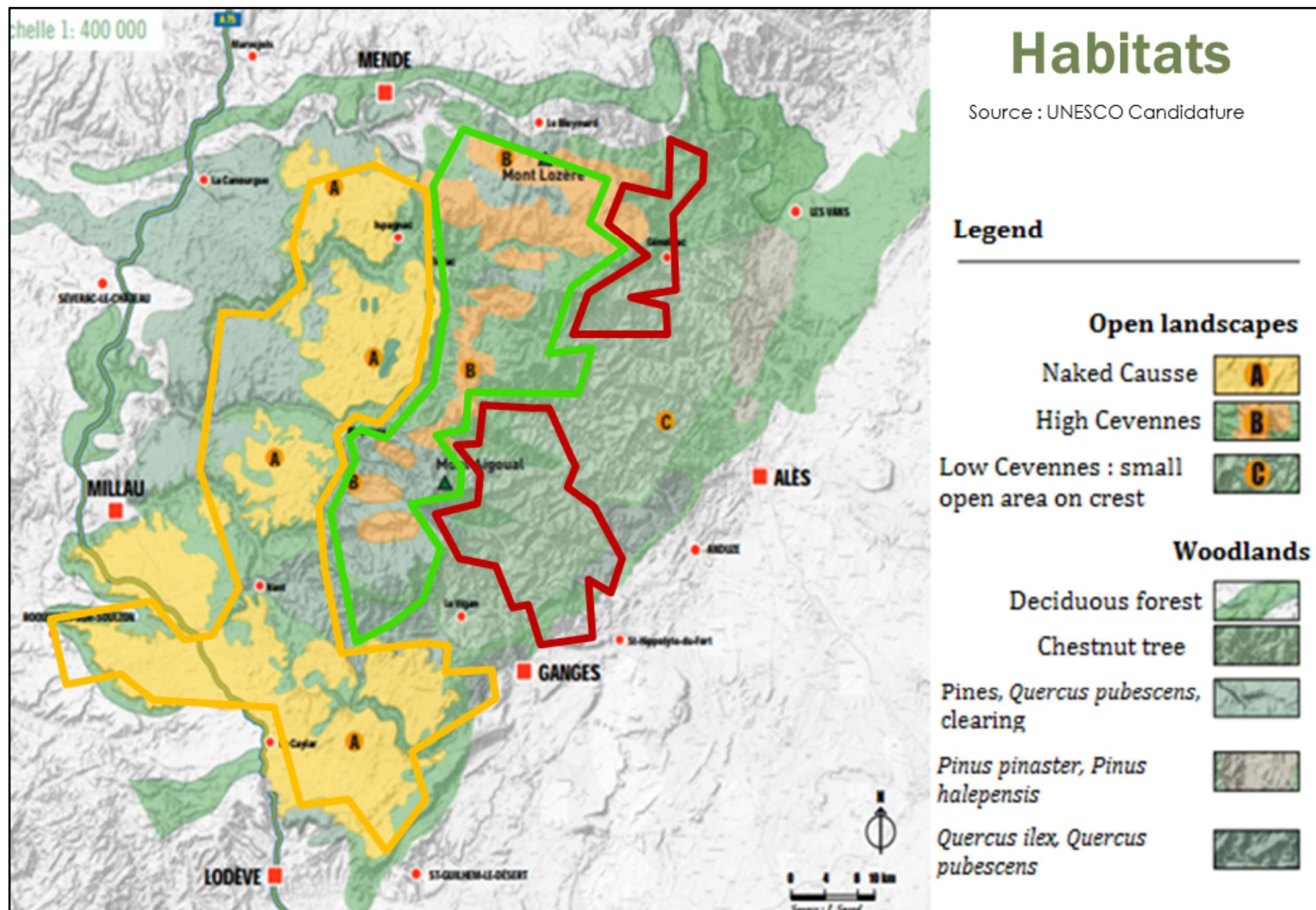
Station	Annual Temp. Min. (1981 – 2010)	Annual Temp. Max. (1981 – 2010)	Annual Rainfall (1981 – 2010)	Days per year with rain (1981 – 2010)
Mount Aigoual	2,7 °C	8,0°C	1931,7 mm	126,5 days
Millau	6,8 °C	15,1°C	731,6 mm	94,5 days

Mount Aigoual is the coldest weather station in the Learning Area, and also one of the coldest in France.

Rainfall is heavy in spring and in autumn, notably during what are called 'Cevenol events', with heavy rains and flooding in the Cevennes and the Cevennes foothills.

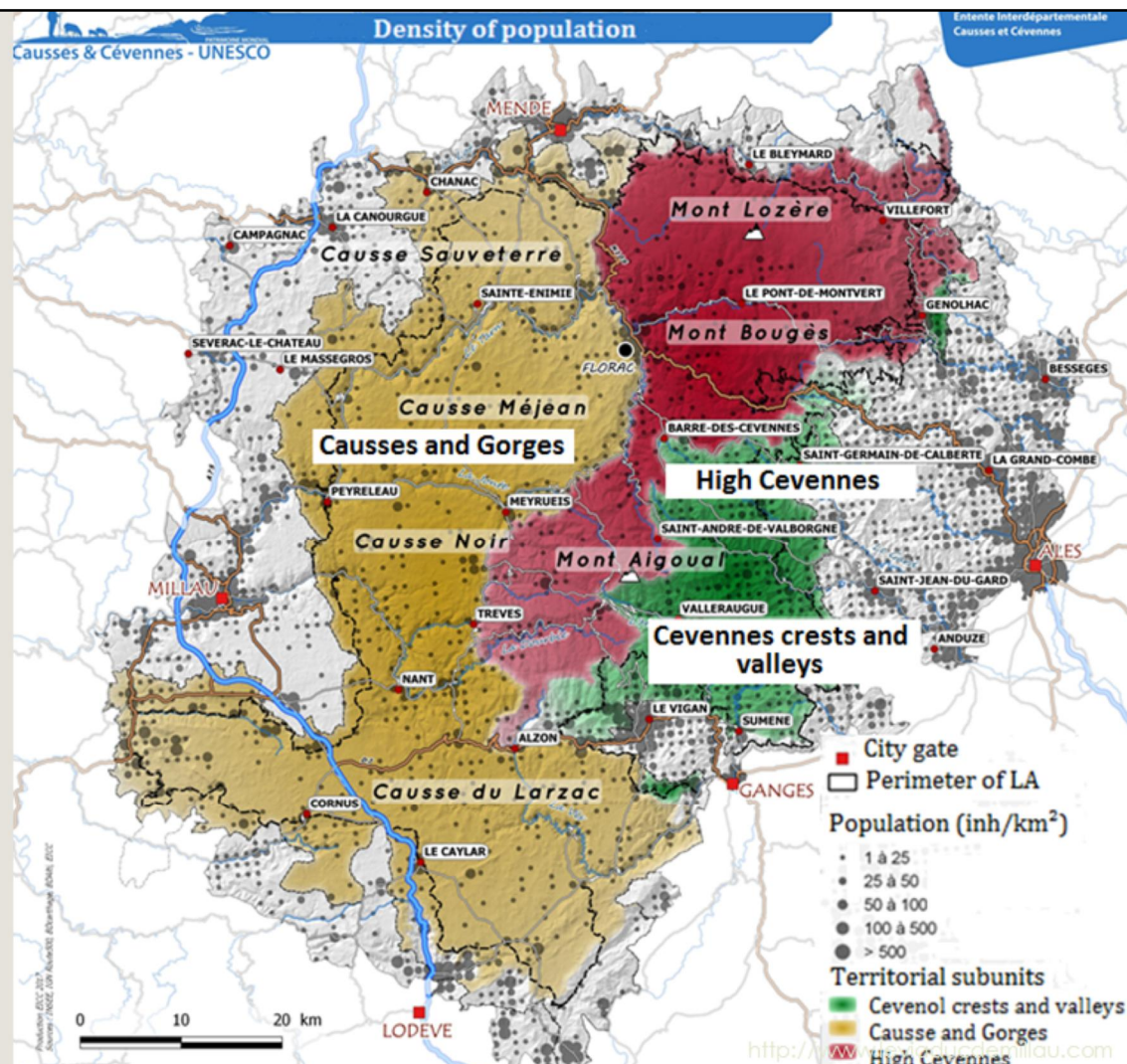
A Cevenol episode lasts several days and between 200 and 400 mm of rain can fall during the period.

The temperature is relatively cold in winter (around 0 °C in January in Millau) and warm in summer (around 22 °C in July in Millau).



	Causse and Gorges	High Cevennes	Cevennes crests and valleys
Vegetation	<p>2 types of limestone plateau :</p> <ul style="list-style-type: none"> - Naked Causse (steppe with rough grazing and rough grazing with brometalia) - Wooded Causse (plantation of conifers, mainly <i>Pinus nigra</i>) 	<p>Mount Lozere and Mount Bouges = open environments (rough grazing at high altitudes, heathlands, damp areas, fallen rocks and hardwood and softwood woods).</p> <p>Mount Aigoual = 80% forest cover with some open areas (heathlands, rough grazing with <i>Nardus stricta</i>).</p>	<p>More than 2/3 of the area is wooded (mainly with chestnut) with some heathlands and rough grazing.</p>
Main habitat types	<p>Steppe with rough grazing, cultivated area, rangelands on calcareous soil, pine forest and beech forest</p>	<p>Mountain grassland, damp grassland, rough mountain grazing, damp rough grazing, heathland with <i>Calluna vulgaris</i> or <i>Cytisus scoparius</i>/oromediterraneus, <i>Pinus sylvestris</i> forest, beech forest</p>	<p>Grassland in the valleys, rangeland on silica with <i>Erica arborea</i>, <i>Genista</i>, <i>Cytisus scoparius</i>; oak forest, chestnut forest</p>

Human geography



According to the 2014 census, the population of the Causses and Cevennes area was 42,300 in the core zone and 151,000 in buffer zone.

Territorial subunits	Inhabitants	Inhabitants/km ²
Causses and Gorges	18 116	7,8
High Cevennes	4 873	4,7
Cevennes crests and valleys	11 345	17,2

The Learning Area is composed of the core zone of the Cevennes National Park and almost the entire buffer zone. The National Park is the only one in metropolitan France to be permanently occupied, (74,000 inhabitants in 2006).

Since the 1970s, positive population dynamics have prevailed in the Causses and Cevennes territory, notably because of the arrival of 'neo-rural' people* in the Cevennes. The population of those who live on the Park territory has increased since the 2000s, with an annual 0.7% increase in population (3,400 additional inhabitants between 1999 and 2006).

The Cevennes crests and valleys are more densely populated than Causses and the Gorges and the High Cevennes.

The road network comprises the A75 highway, which crosses the Larzac Causses and includes the famous Millau viaduct, two main roads (N106 southwards and N88 cross the Lozere) and a dense secondary network.

The departmental road network was built on the plateau and in the gorges starting in 1880 (the Jonte, Gorge of Tarn, South of Languedoc roads among others.)

Railroad lines were also built to facilitate export of Roquefort cheese and gloves manufactured in Millau, but the local transport network has remained fairly small. Currently, apart from the big highway A75, the Causses and Cevennes area has no highways or direct roads, so it is still difficult to travel in Cevennes valleys.

***Neo-rural people** = urban people who decided to move to rural areas.

Main uses of learning area



Forest industry



Anduze's vases (Source : poterie d'Anduze, Les enfants de Boisset)



Sheperd leather bag
(Source : <http://www.lesacduburger.com>)



Donkeys trekking
(source : <http://ane-et-randonnee.fr/fr/>)



Cycling competition in Mount Aigoual

Agropastoralism: traditional Mediterranean system based on extensive grazing.

In-place economy: convenience stores, short marketing circuit for agricultural products (meat, milk, leather, wool, sheep manure called *migou**, other manure, fruit, vegetables, etc.), slaughterhouses (Ales, Le Vigan), activities for tourists.

Local crafts: pottery, Anduze jars, glass, ceramics, leather, dry stones, lauze, flagstones.

Tourism: mainly focused on the gorges and waterways. There is a will to promote sustainable tourism.

Wilderness activities: cycling, hiking, horse trekking, water sports (canoe, kayak, canyoning), climbing, caving, winter sports (skiing, snowshoes, sledge), archery, observation of fauna and flora, picking. The main hiking trail is Stevenson's trail (GR70) from Le Puy en Velay to Ales (Haute-Loire, Ardeche, Lozere and Gard).

Hunting: control of populations of big game.

Fishing: the variety of waterways and aquatic biodiversity ensure good quality recreational fishing.

Forestry: timber, wood for industrial purposes, firewood.

* *Migou* = dried sheep's droppings collected in the summer mountain pastures to be sold to people as garden manure.

Main attributes to be preserved and managed on agropastoralism

- « **Drailles** » : transhumance trails
- **Built heritage**: sheepfolds, (« *jasse* »), artificial piles of stones (« *clapas* »), roof cisterns, terraces, walls, shepherd's shelters (« *cazelle* »), stone houses and hamlets, churches, religious symbols including stone crosses.
- **Hydraulic network (in Cevennes crests and valleys)**: network of dams (« *païssieres* »), network of canals (« *beals* »), « *trancats* » to protect against running out of water, « *robina* » to protect the terraces, « *rascaças* » to control torrents and « *gorgas* » to store water
- « **Lavogne** » : dew ponds



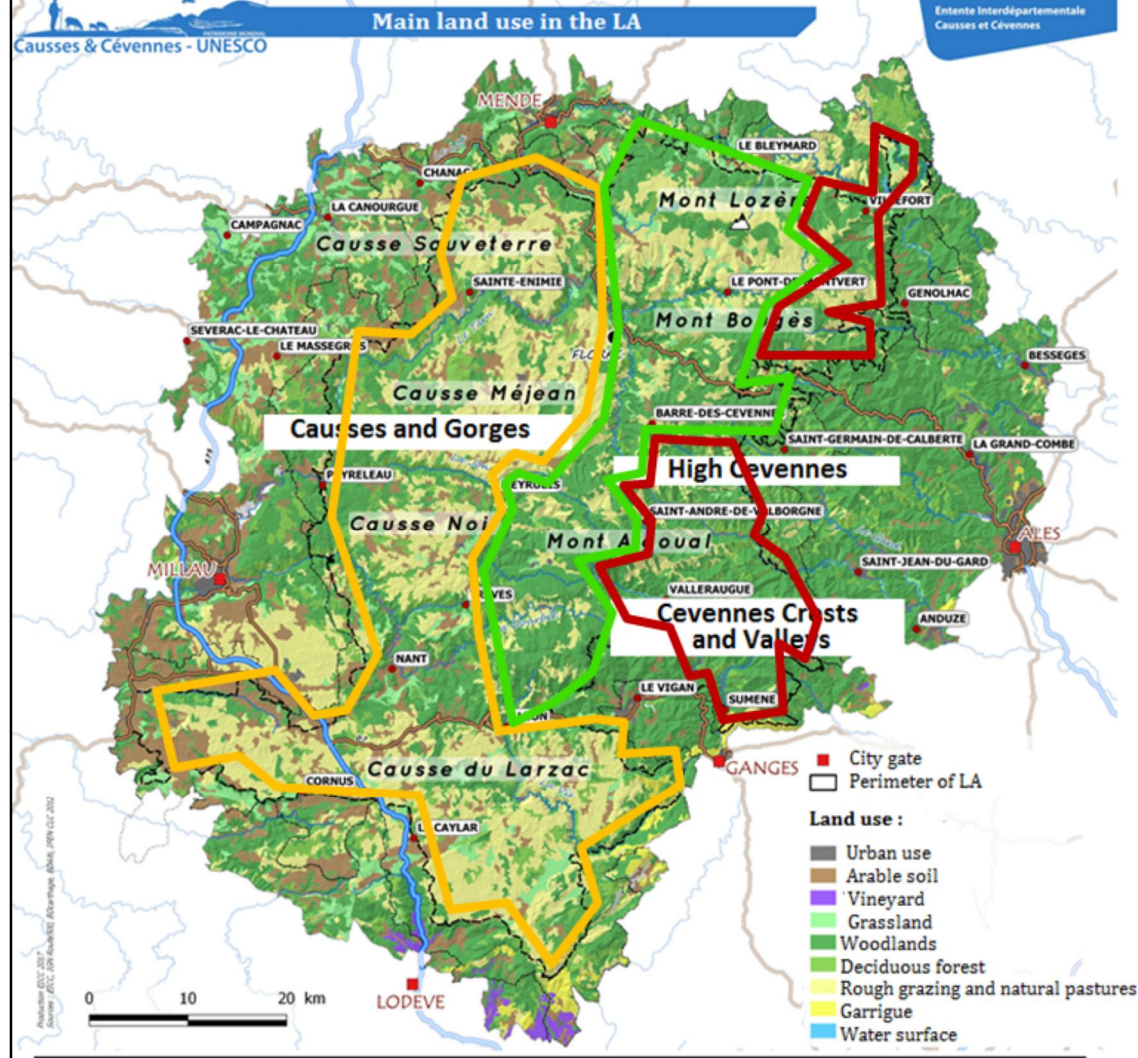
Jasse or sheepfold (source : dossier de candidature UNESCO)



Lavogne or dew pond (source : publication Causse & Cevennes)



Toit citerne or roof cistern (source : PNRGC)



Agriculture: key facts

A total of 1,400 farms (in the core zone: average Utilized Agricultural Area is 200 ha in the Causses but only 50 ha in the Cévennes valleys).

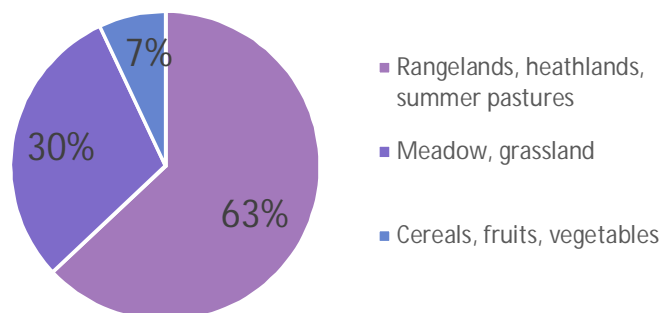
Mainly livestock farms (70% of the farms located in the LA).

Causses: highly specialized in livestock breeding.

Cévennes crests and valleys: more diverse productions.

Utilized Agricultural Area = 155,000 ha (50% of total area)

Distribution of surfaces in the UAA of the LA



Transhumance concerns a small portion of the territory, 6,000 ha, or less than 4% of the utilized agricultural area, most of which is in the High Cévennes (Mount Lozère and Mount Aigoual).

On average, 80% of each farm is utilized agricultural area and the remainder is woodlands and heathlands but in the Cévennes valleys, woodlands account for 62% of the total area.

Agriculture occupies a little more than one third of the Causses and Cévennes area, including a big forest in the Cévennes.

Cereals cultivated are barley, triticale and common wheat in the Causses. Market gardening (especially mild onions with an AOC label) and orchards (especially apples and chestnuts).

The majority of livestock farms raise grass-eating animal, above all sheep. Between 2000 and 2010, there was a reduction in the total number of farms: the number of big farms remained the same, but there was a reduction in the number of the small and medium size farms.

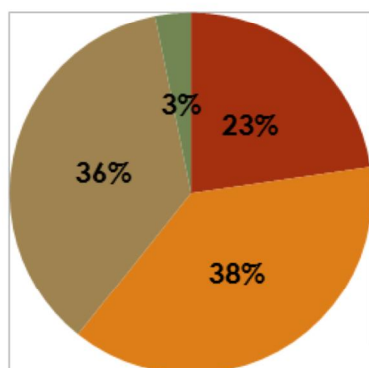
Evolution of animal number	Sheep	Cattle	Horse	Goat	Land under permanent grass	Forage production
2000 - 2010	+ 5,4%	+ 60%	+ 115%	- 30%	+1% (+ 2000ha)	+ 23%

The Transhumance concerns a hundred sheep farmers, who send their flocks, totaling 20,000 ewes in all, plus cattle, to about 20 collective summer pastures. They stay there from June 15 to the end of summer (August 25 – September 15). Transhumance is the most protected form of pastoralism, the animals are under full guard, and is the focus of popular summer festivities.

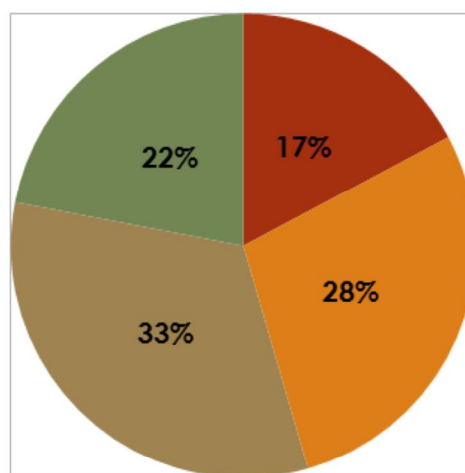
Agriculture key fact

Age of farmers

Causses and gorges

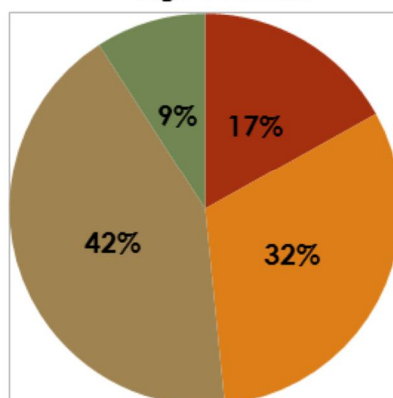


France

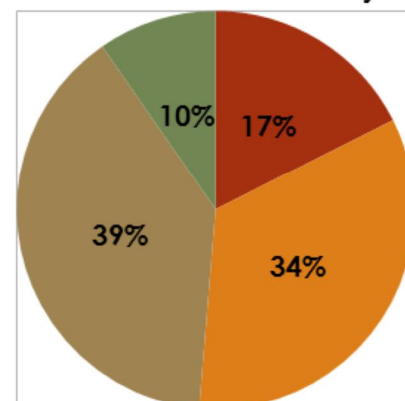


- < 40 years old
- 40 to 50 years old
- 50 to 60 years old
- > 60 years old

High Cevennes



Cevennes crests and valleys

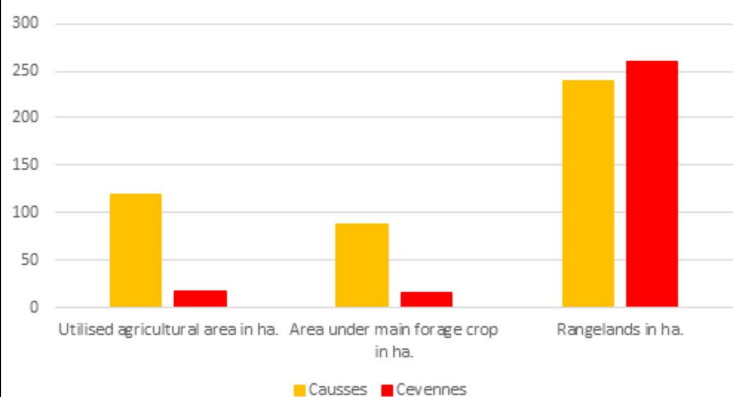


Farmers are generally younger than at national level, as farmers under the age of 50 are far more numerous than at the national level. The percentage of farmers under 60 is only 4%.

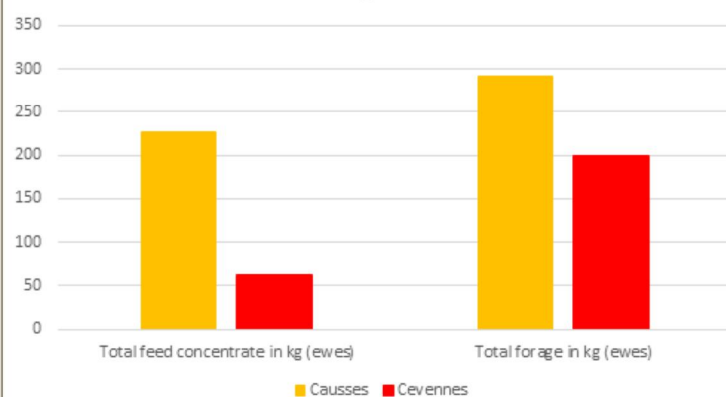
In the LA, farmers are older in the Cevennes crests and valleys and younger on the Causses.

Agriculture: key facts *(source CGAAER report, 2016)*

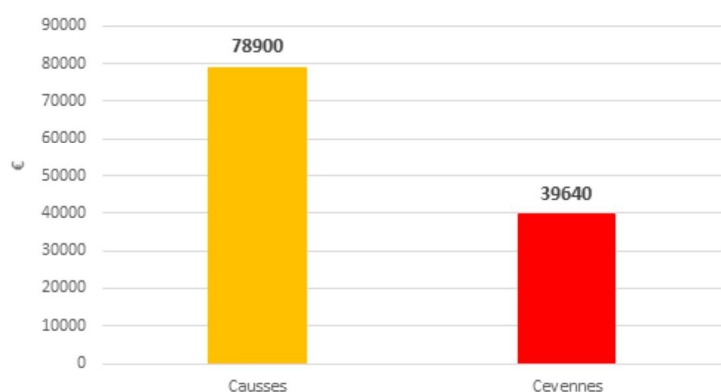
Distribution of surfaces on holdings



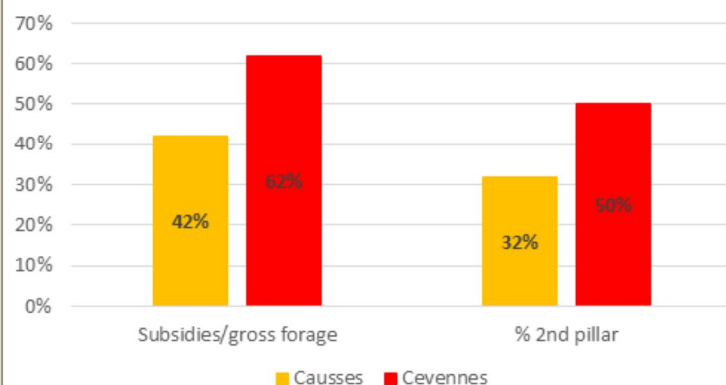
Feeding of ewes



Total subsidies



Distribution of subsidies on holdings



We can see differences between Causses and Cevennes in the structure and financial results of farms. Globally, farms in Cevennes are smaller, so they have a lower income but they have really pastoral systems with using rangelands.

The table below is taken from a prospective study by the Institut de l'Elevage, 2015 (11 holdings on Causses, 5 in Cevennes),

Average value per farm	Causses	Cevennes
Utilised agricultural area in ha.	119 ha	17 ha
Area under main forage crop in ha.	88 ha	16 ha
Rangelands in ha	240 ha	261 ha
Livestock with summer lands	0/11	4/5
Sheep fold	745	310
Sheep/ha used	1,74	1,04
Total production in kg (ewes)	25,6 kg	9,5 kg
Total feed concentrate in kg (ewes)	226 kg	63 kg
Total forage in kg (ewes)	292 kg	199 kg
Balance of food for ewes	103 €	39€
Gros operating surplus/labor unit	36 800 €	28 970 €
Total subsidies	78 900 €	39 640 €
Subsidies/gross product	42%	62%
% 2 nd pillar	32%	50%
Kg carcasse/labor unit	9 035	2 600
Characteristics of livestock raising	Intensification and high investment costs. High animal and labor productivity. Heavy lamb production. Big flocks.	Savings on inputs. Simplified organization of reproduction. Production of light lambs. Most food provided by grazing, a lot of time is required to guard the animal (shepherds). Difficult to build fences. Size of folds is limited.
Level of income	Income higher than in the Cevennes and less dependant on subsidies.	Low income and high dependance on subsidies.

Local animal breeds



Lacaune sheep, PnC



Caussenarde Garrigues sheep, PnC



Rouge of Roussillon sheep

Raïole sheep, PnC



Aubrac cattle

The LA has its own local breeds that are particularly well adapted to the territorial specificities:

Lacaune dairy sheep: present around the town of Roquefort, their milk is mainly used for Roquefort cheese, they are well adapted to grazing rangeland. In 2010, there were 1,300,000 Lacaune sheep in France (20% of the national sheep herd)

Raïole mutton sheep: breed originating from the Cevennes, these sheep eat chestnuts and holm oak acorns all winter long and are transhumed to summer pastures on Mount Aigoual or Mount Lozere. The breed also produces good quality wool. There are almost 2,000 Raïole today.

Caussenarde Garrigues mutton sheep: spend the winter on scrublands (*garrigues*) in the Herault department and summer in the Mount Aigoual or Mount Lozere summer pastures. There are around 1,800 Caussenardes Garrigues today.

Rouge of Roussillon mutton sheep: these sheep are mostly sedentary, well-adapted to a warm climate and are good mothers. There are around 6,000 Rouge of Roussillon today.

Aubrac cattle: these strong cattle are well-adapted to the relatively harsh climate and produce good quality meat. In 2010, there were 165,000 Aubrac cattle.

Goats used to make Pelardon cheese are mainly Alpine goats, but this is not a local breed.

The diversity of the LA favors local breeds because they are well adapted to particular conditions (summer pastures, *causses*, scrublands, woods, etc.).

Agro-pastoralism activities :

■ Causses and Gorges:

- Dairy sheep for milk production (Roquefort)
- Mutton sheep for lamb production without transhumance
- Mutton sheep for lamb production with transhumance from southern Languedoc
- Cows for milk or meat production

■ High Cevennes:

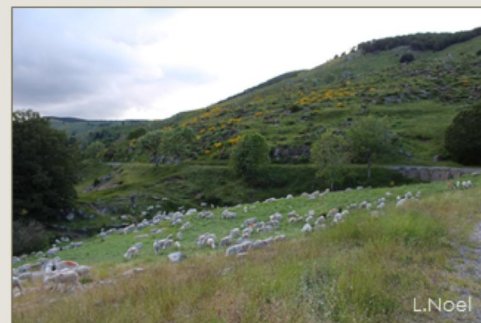
- Transhumant sheep flocks or cow herds from southern Languedoc in summer (May 15 to October 15)

■ Cevennes crests and valleys:

- Mutton sheep for the production of light lambs (15-25 kg live weight)
- Goats for milk production to make Pelardon cheese

■ Other forms of HNV agriculture in the Learning Area:

- Chestnut production
- Non intensive orchards (apple, pear, peach, apricot, cherry, etc.)
- Market gardening on living soil
- Beekeeping
- Other forms of organic farming or integrated farm management



The livestock sector is structured for marketing into:

Beef cattle: production of grass-fed calves for Italy.

Dairy sheep: production of Roquefort and other cheeses like Le Fedou, Perail, etc.

Dairy goat: production of Pelardon cheese for the local and national market.

Mutton sheep: production of light lambs (15-25 kg live weight) to be fattened in feeding centers, or of heavy lambs for the local market.

Some of these emblematic products have a French Label (AOC), or European Label (AOP and IGP). These labels are awarded based on the respect of strict specifications that impose grazing at certain times of year (number of grazing days per year) and, in this way, help manage and protect the cultural landscapes of Mediterranean agropastoralism. These include AOP Roquefort (cheese), AOP Bleu des Causses (cheese), AOP Pelardon des Cevennes (cheese), IGP Agneau de Lozere ELOVEL (lamb).

In the LA, pastoral farms often combine farming activities with agri-tourism, market gardening, fruit production, etc.

Legend



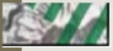
Agro-sylvo-pastoralism with sheep herd (light lambs production) in association with goats agro-sylvo-pastoralism (production of Pelardon)



Agro-sylvo-pastoralism with sheep herd (light lambs production) in association with agro-pastoralism with sheep herd (milk production)



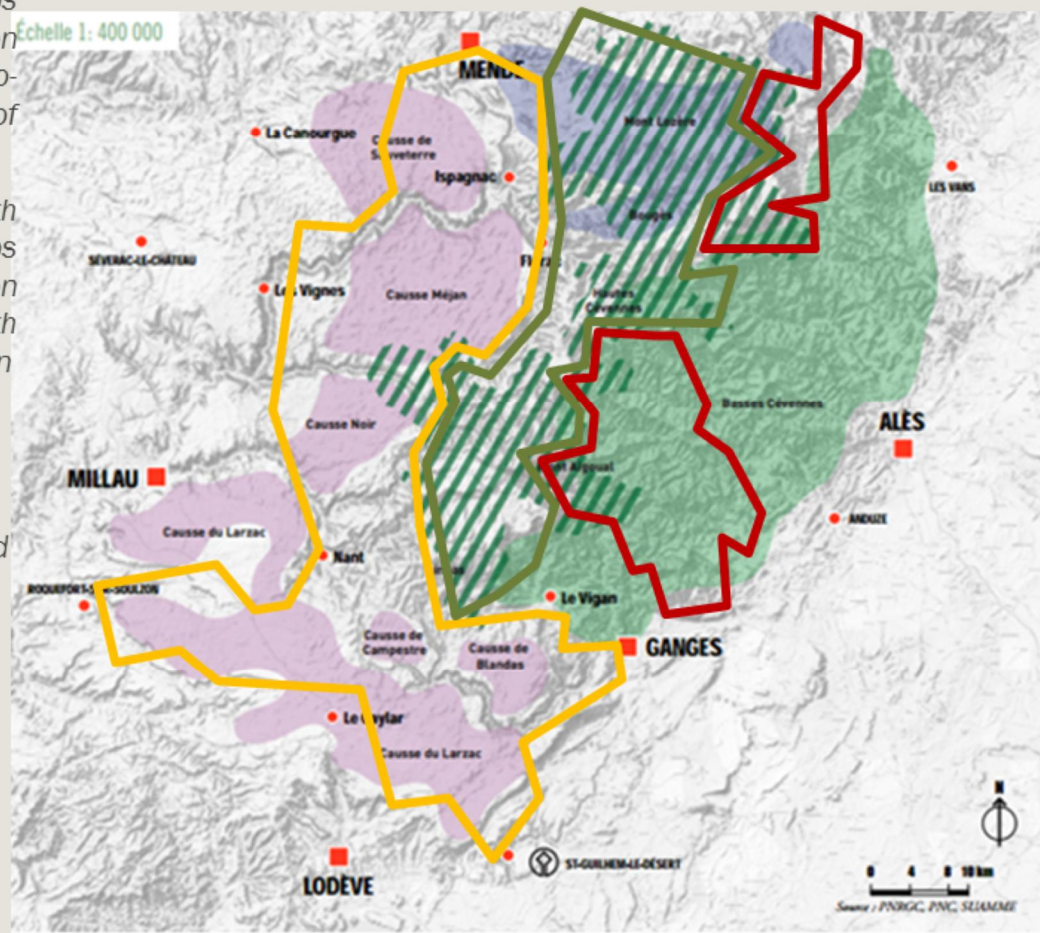
Agro-sylvo-pastoralism with sheep or cows herd for meat



Pastoralism with transhumant sheep herds from Languedoc or Cevenol valleys

Farm production

Echelle 1: 400 000



Source : UNESCO Candidature

Causses and gorges:

The Causses are characterized by large farms (on average between 162 and 200 ha in the core zone). Most are dairy sheep farms (400 farms with on average 372 sheep), milk is sold to make Roquefort cheese (50%) and other cheeses: Perail, Fedou, Salakis. There are also mutton sheep farms (240 farms with on average 218 sheep) that have a sedentary herd with lamb production sometimes combined with another agricultural activity. Some transhumant herds from southern Languedoc are taken to graze on the Causses plateau in summer. Finally there are also some cattle farms (330 farms), dairy and beef cattle (Aubrac cattle) on the fringes of Causses, in the areas with the most rainfall.

Cereals produced in « *doline** » are used to feed sheep.

High Cevennes :

Here, there are mainly transhumant flocks of sheep or herds of local breeds of cows from the Cevennes crests and valleys or from southern Languedoc (transhumance on the hoof).

Cevennes crests and valleys:

The Cevennes valleys farms (which cover an average of 23 ha and 50 ha in the core zone) are almost unstructured and more diversified.

Mutton sheep are raised on 30% of the farms (85 sheep) for the production of light lambs, often combined with another agricultural activity. The sheep are often sent to summer pastures on Mount Aigoual or Mount Lozere. Dairy goats are raised on 20% of the farms (52 goats) to make Pelardon cheese. There are also cattle farms (20% of farms) and horse farms (8% of farms). The rest is market gardening and wine growing.

(Source : CGAAER report, may 2016)

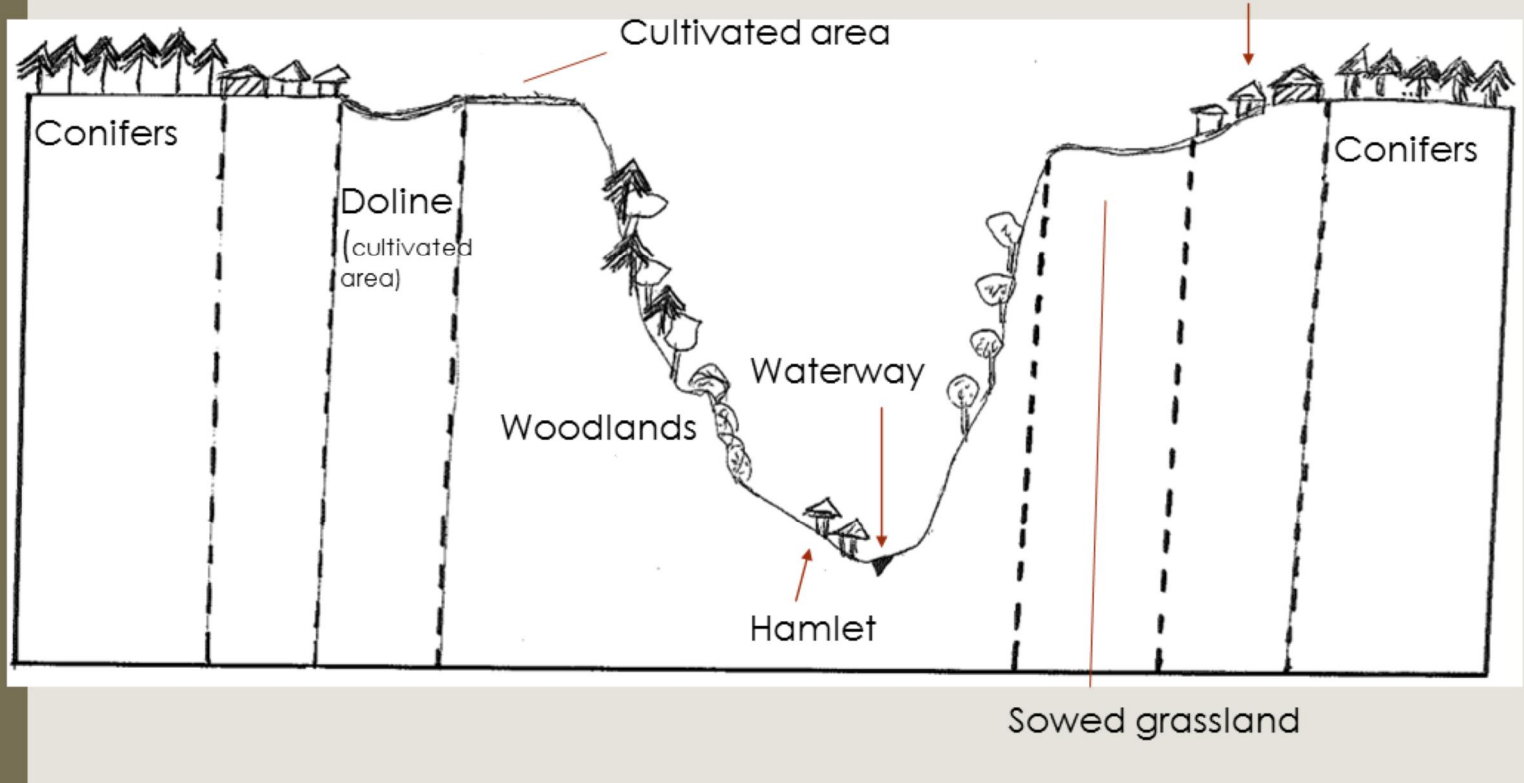
**Doline* = sediment filled calcareous depression used to cultivate crops.

Transect

Causses and Gorges 2017

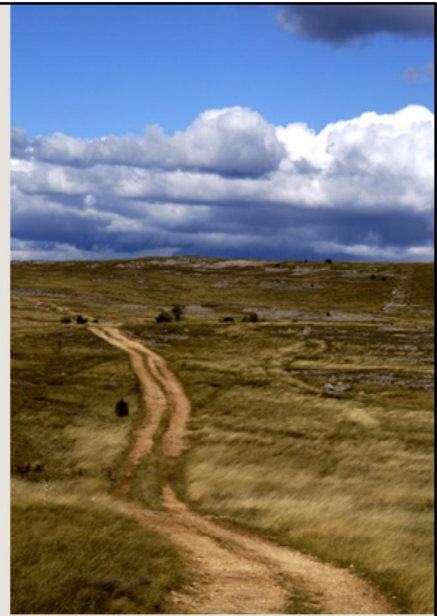
Settlement +
farming buildings

Settlement +
farming buildings



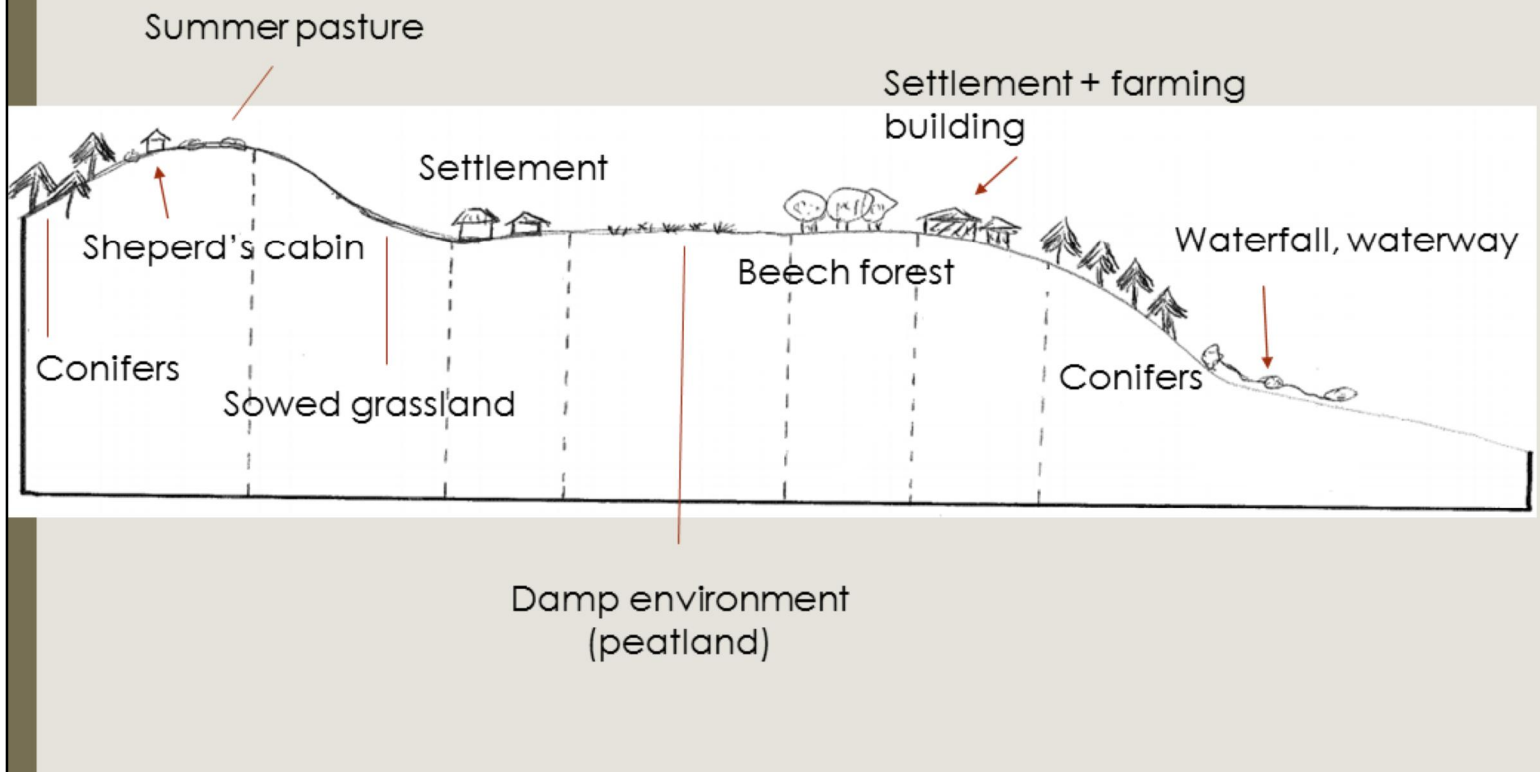
The Causses landscapes are currently characterized by the progression of conifer forests although rough steppe-like grazing land is still very present. In the most favorable areas, agricultural activities are concentrated on cereal crops or sowed pastures. The gorges are wooded with broad-leaved trees on steep slopes. Settlement is scattered.

Landscape – Causses and Gorges



Transect

High Cevennes 2017 – Mount Lozere



The High Cevennes are characterized by large extents of rough grazing used as summer pastures with shepherd's cabins. However conifer woods are gaining over pastoralism. Except for some scattered houses, settlement is grouped in valley bottoms next to water courses.

On Mount Aigoual, the rough grazing areas at the top are used as summer land and the hillsides are wooded.

On Mount Lozere, farms use rangeland and rough grazing on the hillsides. There are springs and streams everywhere. In the last few years, farmers have been removing the stones from the rangeland to transform it into sowed grassland. More and more farm sheds are appearing.

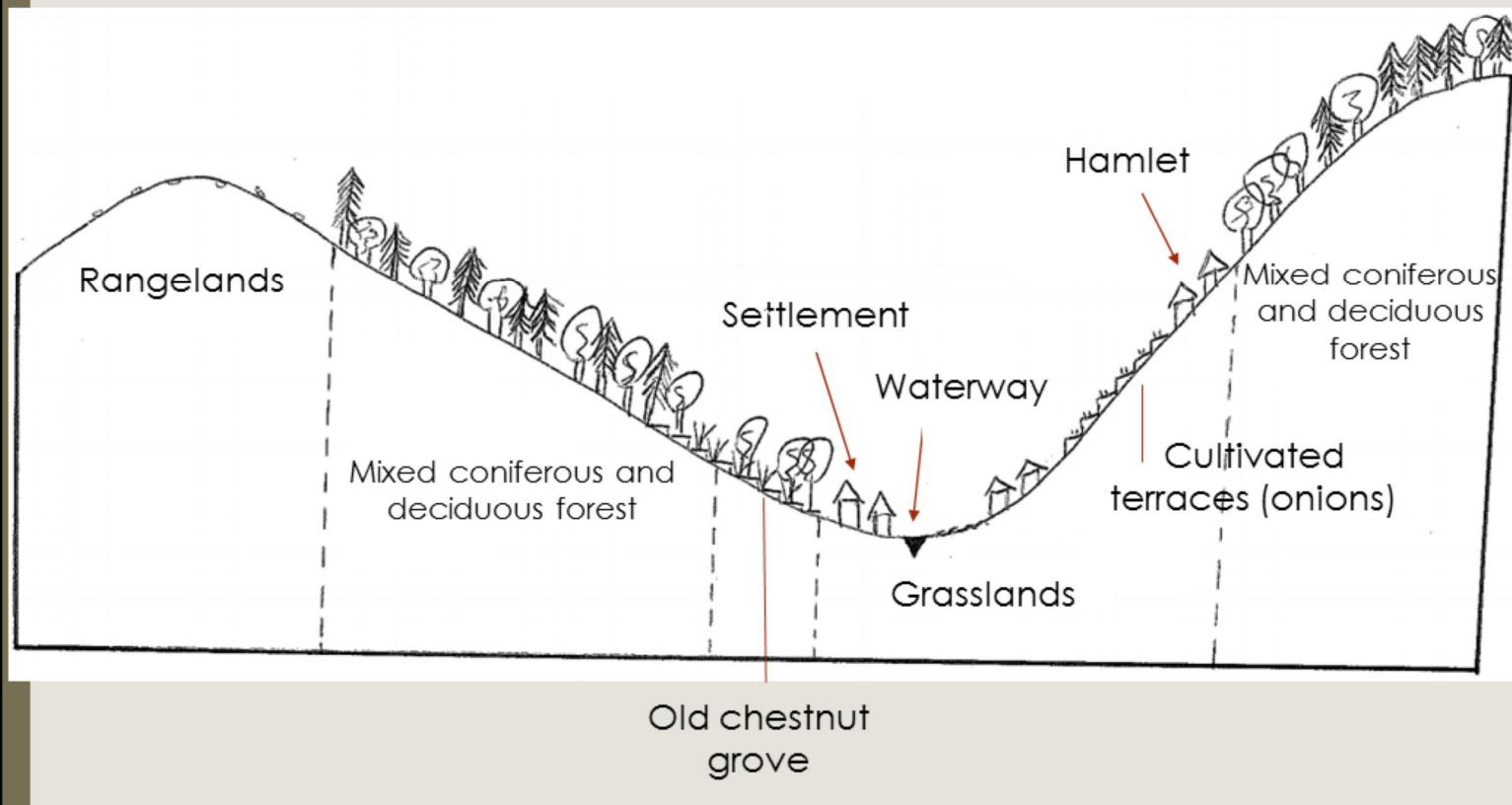
Landscape

High Cevennes – Mount Lozere



Transect

Cevennes crests and valleys 2017



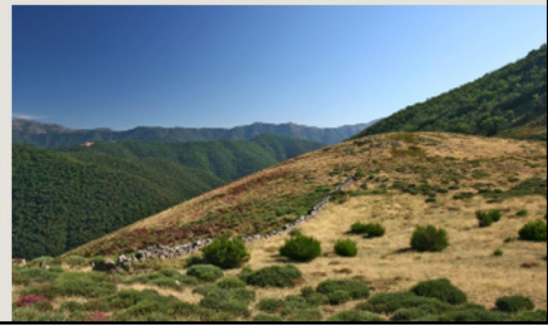
The landscapes of the crests and valleys are covered with mixed forest (conifers, beech trees).

Settlements are villages in the valley bottoms and hamlets on the hillside. Terraces are used to grow mild onions and as pastures. Some grasslands in the valley are also used for pasture and to mow the grass for hay. There are also some relic chestnut groves.

Depending on the valleys, open heathlands or holm oak wood are found on the crest. Conifers were planted on the hillsides and are gaining ground.

Landscape

Cevennes crests and valleys



Open areas



Clockwise : Western green lizard, Stone-curlew, Armerie de Girard, Southern Smooth Snake, Tawny Pipit, Montagu's harrier, Ortolan Bunting, Aster des Cevennes

Threats: abandonment, reduction in grazing and pastoral activities (burning, felling trees), afforestation or intensification with soil tillage, fertilization

What can be done to preserve or improve biodiversity: late mowing, extensive grazing
Rich biodiversity depends on open areas, calcareous soil

Examples of plant species: *Armeria girardii* (Thrift), *Aster alpinus* subsp. *Cebennensis* (Alpine Aster), *Stipa pennata* (European Feather grass), *Sesleria caerulea* (Blue Moor-grass), *Phyteuma tenerum* (Spiked Rampion), *Orphys aymominii* (an orchid endemic to the region), and a lot of other orchids.

Examples of animal species: *Timon lepidus* (Ocellated Lizard), *Lacerta bilineata* (Western Green Lizard), *Podarcis liolepis* (Catalonian Wall Lizard), *Circus pygargus* (Montagu's Harrier), *Circus cyaneus* (Hen Harrier), *Burhinus oedicnemus* (Stone-curlew), *Celes variabilis* (Grasshopper) *Coronella girondica* (Southern Smooth Snake), *Anthus campestris* (Tawny Pipit) , *Emberiza hortulana* (Ortolan Bunting) , *Athene noctua* (Little Owl).

(Source pictures and translation: <https://inpn.mnhn.fr> - www.cevennes-parcnational.fr - flore.aveyron.free.fr)

Cultivated areas



Clockwise : Corn Chamomile, Summer Pheasant's eye, Green Bristle-grass, Eurasian Griffon Vulture, Common Quail, Sky Lark, Western Whip Snake, Peacock butterfly

Threats: Abandonment of tilling, creation of enclosures, weeding, the use of chemical products (that should only be used in moderation).

How to preserve or improve biodiversity: continue using cultural practices and keep open areas, keep walls and terraces.

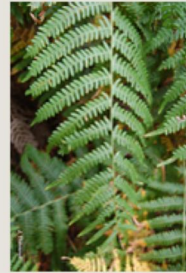
Rich biodiversity depends on open areas, rich soil with water, plants are opportunist and cannot survive too much competition. Animals depend on open areas to hunt and small habitats around cultivated areas (walls, water).

Examples of plant species: *Anthemis arvensis* (Corn Chamomile), *Adonis aestivalis* (Summer Pheasant's-eye), *Adonis flammea* (Large Pheasant's-eye), *Chenopodium polyspermum* (Many-seeded Goosefoot), *Urtica urens* (Small Nettle), *Seteria viridis* (Green Bristle-grass), *Agrostemma githago* (Corncockle), *Asperula arvensis* (Blue Woodruff), *Ranunculus arvensis* (Corn Buttercup), *Papaver rhoeas* (Common Poppy), *Gagea villosa* (Hairy Star of Bethlehem).

Examples of animal species: *Gyps fulvus* (Eurasian Griffon Vulture), *Aegypius monachus* (Monk Vulture), *Neophron percnopterus* (Egyptian Vulture), *Coturnix coturnix* (Common Quail), *Pyrhacorax pyrrhacorax* (Red-billed Cuckoo), *Alauda arvensis* (Sky Lark), *Hierophis viridiflavus* (Western Whip Snake), *Anguis fragilis* (Slow Worm), *Aglais io* (Peacock)

(Source of pictures and translation: <https://inpn.mnhn.fr>)

Scrub environment



Clockwise : Genette, Box, Genevrier, Heather, Bracken, Bruyère à balai, Broom, Golden Eagle, Dartford Warbler, Adder, Western Montpellier Snake

Threats: Enclosure and afforestation, invasion by dominant species

How to preserve or improve biodiversity: fell trees, fell pines, cut back high shrubs, use spin weeder, extensive grazing, burning, avoid artificial afforestation.

Rich biodiversity depends on open areas (no woodlands) but a patchwork of relatively open landscapes

Examples of plant species:

Causses: *Amelanchier ovalis* (Snowy Mespilus), *Buxus sempervirens* (Box), *Echinopartum horridum* is a thorny and cushion-shaped chamaephyte, *Juniperus communis* (Common Juniper), *Prunus spinosa* (Blackthorn), *Trifolium rubens* (Red Clover) *Rubus* spp, *Rosa villosa* (Apple Rose)

High Cévennes: *Genista sagittalis* (Winged Greenweed), *Calluna vulgaris* (Heather), *Vaccinium myrtillus* (Bilberry), *Cytisus oromediterraneus* (no common name in English)

Cévennes crests and valleys: *Cistus laurifolius* (Laurel-leaved Cistus), *cistus pouzolii* (common name unknown), *Adenocarpus complicatus* (no common name in English), *Erica scoparia* (Broom), *Erica arborea* (Tree heath), *Quercus ilex* (Holm oak - Evergreen oak), *Genista monspessulana* (Montpellier Broom), *Pteridium aquilinum* (Bracken), *Cytisus scoparius* (Broom), *Genista scorpius* (Purge broom).

Examples of animal species:

Causses: *Aquila chrysaetos* (Golden Eagle), *Circaetus gallicus* (Short-toed Eagle), *Sylvia undata* (Dartford Warbler), *Lanius collurio* (Red-backed Shrike), *Emberiza cia* (Rock Bunting), *Anthus campestris* (Tawny Pipit), *Saxicola rubicola* (European Stonechat), *Podarcis muralis* (Common Wall Lizard), *Vipera aspis* (Asp Viper)

High Cévennes: *Anthus pratensis* (Meadow Pipit), *Anthus spinoletta* (Water Pipit), *Vipera berus* (Adder), *Zamenis longissimus* (Aesculapian Snake), *Zootoca vivipara* (Viviparous Lizard), *Antaxius sorrezensis* (French Mountain Bush Cricket), *Metrioptera brachyptera* (Bog Bush Cricket)

Cévennes crests and valleys: *Caprimulgus europaeus* (European Nightjar), *Sylvia hortensis* (Orphean Warbler), *Sylvia cantillans* (Subalpine Warbler), *Lanius senator* (Woodchat Shrike), *Circaetus gallicus* (Short-toed Eagle), *Malpolon monspessulanus* (Western Montpellier Snake), *Genetta genetta* (Genet), *Podarcis liolepis* (Catalonian Wall Lizard), *Lacerta bilineata* (Western Green Lizard).

Woodlands



Clockwise : Sweet chestnut, Beech, Green Shield-moss, Cyclamen des Baleares, Firecrest, Great spotted woodpecker, Grand capricorne, Aesculapian snake

Threats : no real threat except invasion by conifers in some places

How to preserve or improve biodiversity: No human intervention in deciduous forest; limit expansion of conifers. Rich biodiversity depends on old trees (the older the better), local tree species.

Examples of plant species: *Castanea sativa* (Sweet Chestnut), *Quercus ilex* (Holm oak - Evergreen oak), *Quercus pubescens* (Downy oak), *Buxus sempervirens* (Box), *Fagus sylvatica* (Beech), *Quercus petraea* (Sessile oak), *Pinus sylvestris* (Scots Pine), *Acer pseudoplatanus* (Sycamore tree).

Afforestation: *Pinus nigra* subsp. *Salzmannii* (Pyrenean pine), *Cedrus atlantica* (Atlas Cedar), *Picea abies* (Norway Spruce), *Larix decidua* (European Larch), *Pinus pinaster* (Cluster pine - Maritime Pine), *Pinus nigra* (Black pine). *Ilex aquifolium* (Holly), *Hedera helix* (Lierre grim pant), *Smilax aspera* (Common Smilax), *Cyclamen balearicum* (Balearic cyclamen), *Anthoxanthum odoratum* (Sweet Vernal Grass), *Pteridium aquilinum* (Bracken), *Cytisus scoparius* (Common broom), *Aster alpinus* subsp. *Cebennensis* (Alpine aster), *Buxbaumia viridis* (Green Shield-moss).

Examples of animal species: *Turdus philomelos* (Song Thrush), *Regulus ignicapilla* (Firecrest), *Accipiter nisus* (Eurasian Sparrowhawk), *Accipiter gentilis* (Northern Goshawk), *Strix aluco* (Tawny Owl), *Certhia brachydactyla* (Short-toed Treecreeper), *Poecile palustris* (Mesange nonette*), *Dendrocopos major* (Great Spotted Woodpecker), *Tetrao urogallus* (Wood Grouse), *Aegolius funereus* (Tengmalm's Owl), *Cerambyx cerdo* (Great Capricorn beetle), *Lucanus cervus* (Stag Beetle), *Thaumetopoea pityocampa* (Pine Caterpillar), *Zamenis longissimus* (Aesculapian Snake)

(Source pictures and translation: <https://inpn.mnhn.fr>)

The time line Causses & Cevennes

Explaining the present with the past



Source : The Regional Nature Reserve of Grands Causses

An overall view of the time line

Up to 1950

Silkworm farm
Large domain
in Causses, little
farms in
Cevennes
Rural exodus

1950 – 1970

Mechanization,
modernisation,
intensification
Creation of
CAP

1970 – 1990

Intensification
and
specialization
Environment
awareness

1990 – 2017

Development of
environmental
protection tools



Dairy farm

Wilkworm
farming

CAP reform
of 2015



Source pictures :

Book : L'aveyron, au temps de la terre 1950 -1960

<http://www.lesrendezvousdelareine.com/page/8>

<http://www.ethiquable.coop/fiche-producteur/association-paysans-rance-commerce-equitable-France>

<http://www.museedelasoie-cevennes.com/>

Heritage from the past

The pre-modern legacy - Introduction

For millennia (since about 6,000 years BC), sedentary or transhumant agropastoral systems have enabled people to live on this territory and to maintain vast open spaces used to pasture flocks and grow crops, thereby creating specific landscapes and very rich biodiversity.

Humans have left their imprint on the landscape the built heritage, which reflects the population's activity, faiths and traditions.

Human settlement in these difficult regions took place at the expense of the forest, which was the original land cover.

In the Middle Ages, the monastic orders, first the Templars and then the Hospitallers on the Causses, played a very important role in clearing the landscape and introducing livestock breeding.

Pre-modern heritage : before 1950

Large farm estates on the Causses and self-sufficient farms in the Cevennes used all the land that could be farmed

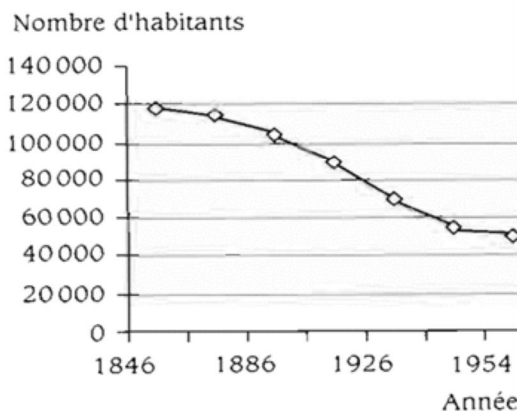
National reforestation with conifers on Mount Aigoual to control erosion was a priority at the end of the 19th century.

The strong in-place economy in the Cevennes valleys focused on silkworm farming and mining around Ales

Rural exodus in the period between the two World Wars

Graphe :

Evolution of inhabitants on the Cevennes National Park with important decrease of population



Silkworm farming

Rural exodus



The main facts concerning the territory Causses and Cevennes territory during the 20th century:

The territory was characterized by peasant agriculture; all possible land was farmed. The rural exodus began between the two World Wars.

Causses and Gorges:

The old system with the big estates managed by farmers or sharecroppers, small farms around the villages, landless peasants who worked in the big domains came to an end. Big estates averaged 400 ha, medium farms 100 ha, and small farms 50 ha.

The basic economy focused on raising Lacaune sheep for cheese production:

- development of the Roquefort cheese industry;
- cereal crops, above all wheat;
- expansion of forage crops;
- increase in the sheep population and a change in the kind of livestock: wool was no longer produced, instead, sheep were raised for cheese and meat (especially lamb) ;

Complementary productions included cattle, horses, vineyards and fruit trees in the valleys, forestry and forest resources on the hillsides.

High Cevennes:

During the 19th century population growth reached a peak leading to pressure on pastureland.

At the end of the 19th century, the State helped reforest highly degraded zones caused by overgrazing above all on Mount Aigoual.

Cevennes crests and valleys:

Chestnut groves on the terraces plus sheep and goat breeding.

Strong in-place economy focused on silkworm farming and the cultivation of mulberry trees as food for the silkworms. The built heritage was modified to accomodate the silkworms.

At the same time, coal mining around Ales played a major role in economic development. Railroads were built to export the coal.

Between 1950 and 1960, silkworm farming and mining around Ales stopped increasing the rural exodus of the Cevennes population.

Period 1

Changes from the XXth Century

Period 1 : 1950 - 1970

1957

The beginning of genetic selection in Lacaune for milk

1962

Creation of the Common Agricultural Policy

1960-1970

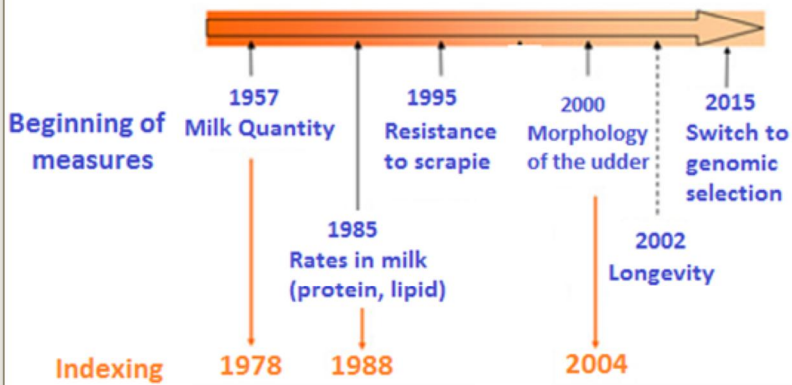
Specialization for dairy production (Roquefort on Causses) or meat production

1974

The beginning of genetic selection in Lacaune for meat

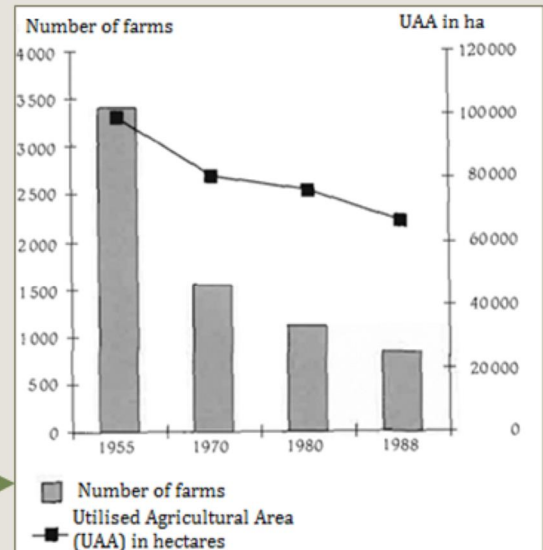
Lacaune for milk selection scheme

Chronology of the selected characters



Graphe:

Evolution of the number of farms and Utilised Agricultural Area with decrease of both number and area of farms



In the second half of the 20th century:

From 1950 to 1970: this was a period of reconstruction after the war, which led to many changes to traditional agropastoralism and transformed the landscape of the Causses and Cevennes, in particular through:

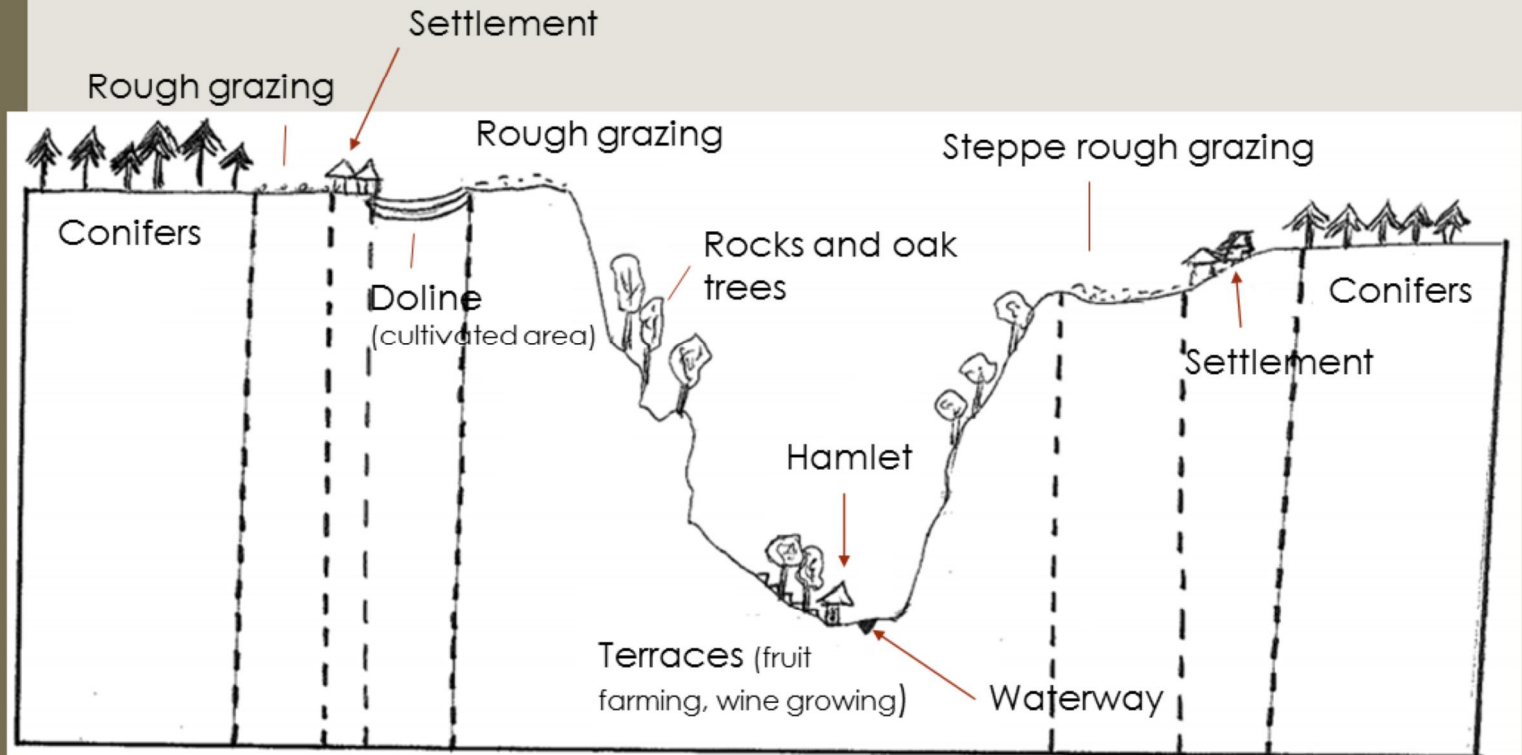
- Wire fencing after World War 1, which meant animals could be enclosed and shepherds were no longer required;
- Mechanization and farm modernization (extension and modernization of the farm buildings, the use of tractors) facilitated fieldwork ;
- Intensification of agriculture and increase in production thanks to the creation of the Common Agricultural Policy (CAP) in 1962:
 - Fertilization: mineral fertilizer and lime were used.
 - Development of forage cropping and seed production.
 - Beginning of the use of genetic selection.
 - Between 1960 and 1970, the farmers specialized in dairy production (Roquefort cheese) and meat production for the meat industry

Changes in agricultural practices and the structuring of farms appeared with the creation of the agricultural cooperatives and the farmers' union (Young Catholic Farmers' Union), the development of banks and the arrival of agricultural advisory services.

The other highlights were the development of the railroad network and the creation of open markets, the impact of industrialization on the economic sector.

Period 1 : 1950 - 1970

Causses and Gorges - 1950



Causses

From 1950 to 1990: reconstruction after war.

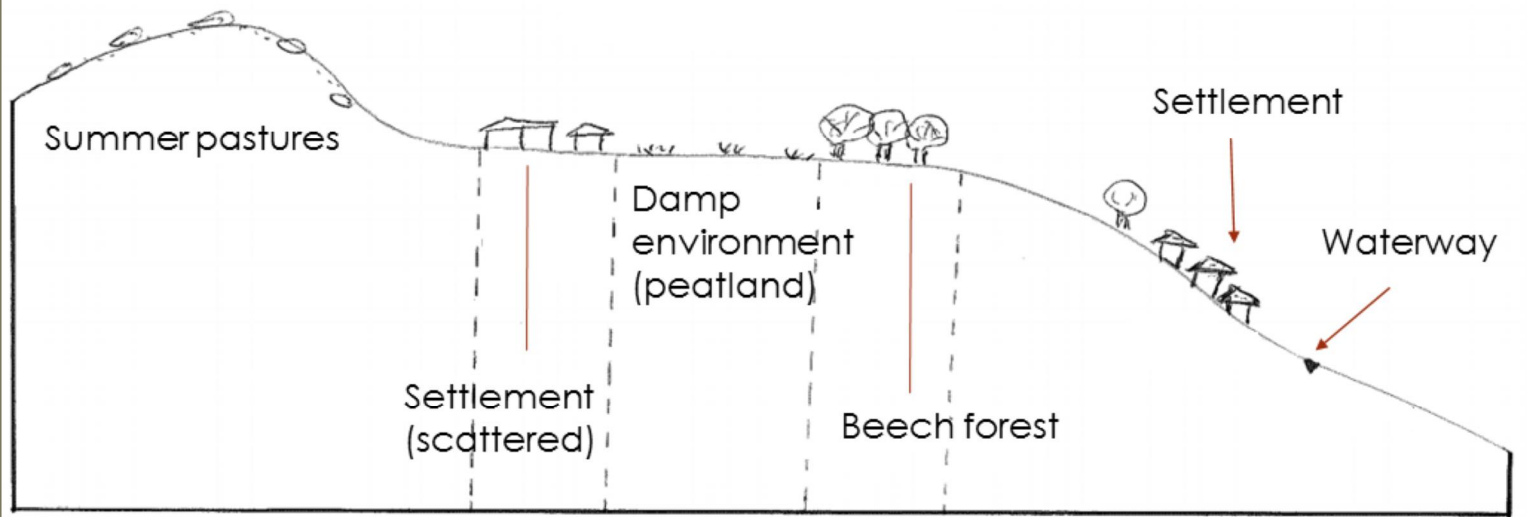
This period witnessed the end of the big estates whose land was reforested with conifers, particularly with the Black Pine of Austria, including on arable land, with the French National Forest Fund; the big estates are purchased by investors not farmers, and the rest were rented out to farmers.

Between 1960 and 1965, a new agricultural system appeared: with animal nutrition, mechanization, forage crops and seed production, land planning with the French structure which manage agricultural land (*French acronym SAFER*), the development of agricultural cooperation, increased agricultural intensification, farming systems that were well suited to the Causses. There was also an increase of the number of ewes of different breeds: Lacaune for milk, Blanche du Massif Central for meat.

The farmers' union (Young Catholic Farmers' Union) played a major role within the framework of the Causses Restructuring Plan, with the support of Edgard PISANI, Minister for Agriculture from 1961 to 1966, with the construction of the necessary infrastructure (roads, water, power lines). These public works, particularly on the Causse Mejean, were carried out between 1961 and 1975 with subsidies from the Ministry.

Period 1 : 1950 - 1970

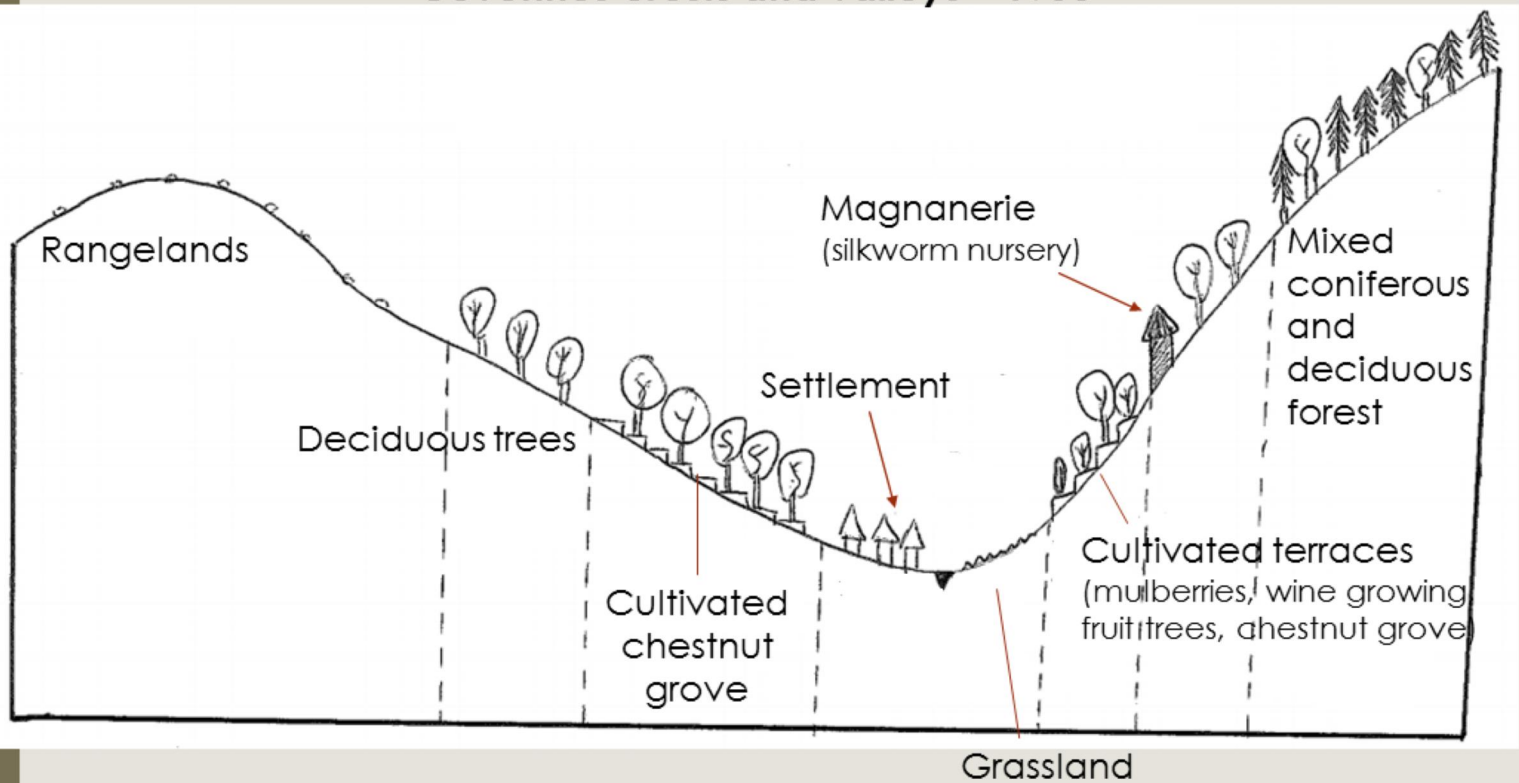
Mount Lozere - 1950



High Cevennes

Because of the rural exodus, the open areas of Mount Lozere became degraded due to less pastoral pressure.

Cevennes crests and valleys – 1950



Cevennes crests and valleys

From 1960-1970, the open markets and price reductions led to an increase in size of the sheep herds, with increased investment in production equipment and farm specialization.

Following the rural exodus, from 1970 on, there was a wave of immigration when « neo-rural people » started small goat farms. This enabled the expansion of this type of livestock breeding and the creation of agricultural cooperatives.

1980-1985 saw the beginning of mild onion production (with a label), the production and processing of sweet chestnuts and also local crafts (art, jewelry making), truck farming, fruit tree orchards and agro-tourism. The « neo-rural people » contributed significantly to this development.

Period 2

Further changes from the XXth Century

1970
Creation of
Cevenne
National
Park

1970's
Milking
overproduction
Continuation of
intensification and
specialization

1971-1981
Activism on
Larzac

1985
Mountain
Law

1985 - 1995
Immigration
wave of neo rural
people in
Cevennes



Causses:

As early as 1970, the increase in production led to overproduction, especially in the dairy sector. As the increase in production took place without increasing the amount of grazed pasture, some areas were colonized by trees.

This period was characterized by:

- Continued intensification and specialization (use of fertilizers and chemical plant protection products, the use of veterinary medication) ;
- Modernization of equipment and mechanization, investments in farms enabled by European subsidies;
- Expansion of irrigation with the creation of ASA (owners' trade union) and drainage of damp zones;
- Revolution in forage species: new types of forage plants (*Dactylis glomerata*, *Festuca*, *Lolium perenne*) developed by the French Agricultural Research Institute (French acronym INRA);
- Development of the food industry and agricultural structures;
- Access to overseas markets.

High Cevennes:

In 1970, transhumance of sheep began again.

Cevennes crests and valleys:

The production of goats cheese (Pelardon) expanded with the expansion of agricultural cooperatives.

The Cevennes National Park was created in 1970, enabling agro-environmental progress (open spaces, expansion of summer pastures).

Sheep and goats were fed with forage and concentrates produced outside the area.

The stock of sheep stagnated and the stock of goats declined, which resulted in less pastureland being used and hence the invasion by scrub-like vegetation of the underbrush and old terraces previously kept clear by goats and also on Mount Aigoual, where the rough grazing had been kept clear by transhumaned sheep.

From 1980, the cultivation of mild onions intensified.

Period 3

Present times

Period 3 : 1990 to today

1992

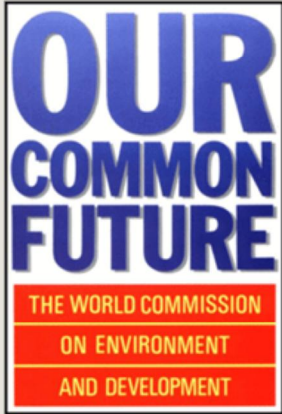
Earth Summit in Rio
(Brundtland report)
+ Natura 2000
+ CAP reform

1998

Development plan of
rural area (PDZR)

2011

Arrival of wolf in Lozere
Addition of the Causse
and Cevennes to the
World Heritage List



« Wolf or pastoralism, we have to choose ! »

Predators : the mountain self-service



From 1990 to 2017

In the 1990s, environmental approaches and tools were introduced :

In 1987, after the huge wildfires in 1986, the Mediterranean Forest Conservatory was created.

In 1991, the first environmental contracts with farmers were drawn up, in application of European rules (article 19). These contracts were reinforced by the CAP reform in 1992 (PHAE, MAE, PDZR* with European funds).

In 1992, the Brundtland report by the World Commission on Environment and Development (United Nations) was published along with a founding text called « Our Common Future - From One Earth to One World » which, among other things, defined the concept of sustainable development (with 27 sustainable development principles). The report was adopted during the Rio de Janeiro Earth Summit.

Reform of the CAP with strengthening of agro-environmental measures (PHAE and MAE*).

Beginning of Natura 2000 with the application of two government directives : « Fauna and Flora Habitat Directive » (May 21, 1992) and the « Birds Directive ».

At the same time, several agricultural practices were changing thanks to awareness of the risks of enclosing the environment (risk of wildfire, problem of biodiversity); pastoral arrangements with funds from the Mediterranean Forest Conservatory and support for livestock breeding farms in risk zones; beginning of the appearance of local products, farmers shops, local product markets (1980-1990).

There was also the arrival of wolves in Lozere in 2011.

*PHAE = Subsidies for grasslands, 2nd pillar

MAE = Agro-environmental measures

PDZR = Rural development, 2nd pillar

Causse and Gorges

1990-2017: increase in the use of rangeland by farmers.

The Brundtland report and environmental regulations laid down in CAP made farming less intensive. But since the return of wolves in Causse Mejean, breeders have tended to intensify their systems again.

Cevennes crests and valleys

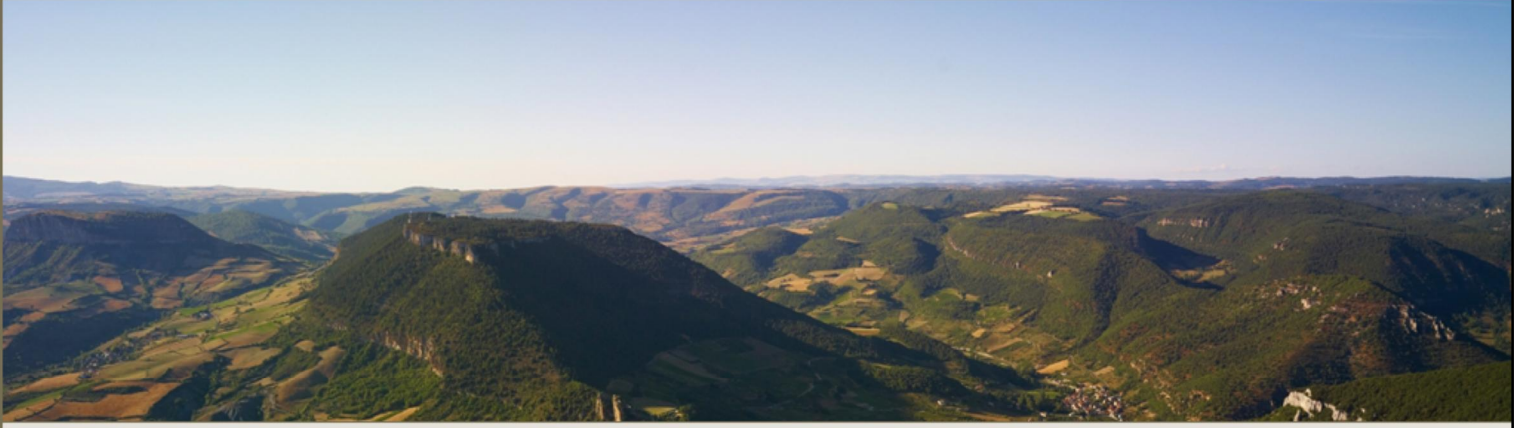
In the 1990s, subsidies for agro-environmental measures encouraged breeders to increase their rangelands (subsidies for grassland, Agro-environmental measures) but the increase in the size of the herd did not compensate for the reduction in the number of farms, partly due to the drop in breeders' income. (source: Mazoyer et Roudart, 1997).

The chestnut gall wasp (*Dryocosmus kuriphilus*) began to attack chestnut trees and caused a drop in production in both sweet chestnuts and chestnuts used as feed for animals.

The proportion of wooded cover in the core zone of the Cevennes National park was 15% in 1850, 72% in 1980 and 74% in 1990.

Scenarii 2030

Causses & Cevennes



Source : The Regional Nature reserve of Grands Causses

The business as usual scenario

In 2030 we will observe an important phenomenon of both abandonment and intensification of lands

The rural development and social driving forces

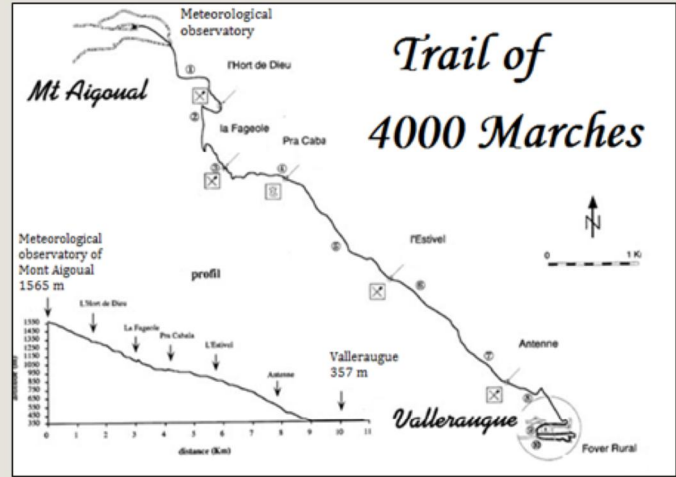
Activities of secondary and tertiary sector



Stevenson's trail map



Dry stones wall building



Trail of 4000 « steps » famous trail of Mount Aigoual



Ski station Prat Peyrot in Mount Aigoual



Local craft



Rural camping site

With LA was put on UNESCO's World Heritage List, the area became a very popular tourist destination and developed into an important economic sector. The number of hotels, guest houses, farm camping sites, restaurants, etc., increased while the local road network remained underdeveloped because of the mountain landscapes.

Hiking is very popular with tourists, especially along Stevenson's trail from Le Puy-en-Velay to Ales (274 km) and the 4000 step trail from Vallerangue to the summit of Mount Aigoual (9.5 km – 1,220 m of difference in altitude).

The economic driving forces

Food chains and markets

➡ Product quality : PDO, PGI

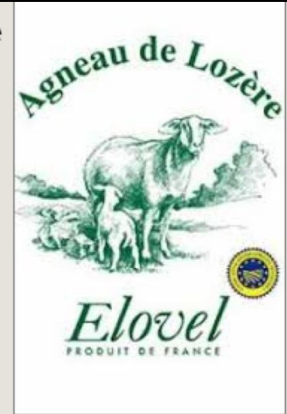


PDO Pelardon (goat cheese)



PDO Roquefort (ewe cheese)

Lamb of Lozere
PGI



↓ Cooperative of Cevennes for
onions, apples, sweet
chestnut, etc



Local
market



Some local products are sold in street markets where producers and sellers set up tables with their products (food or other products). This is the main way the local goat and ewe cheeses produced in our LA are sold. Cooked pork meats, wines, vegetables, fruits, clothes, craft products, etc. are also sold. Weekly markets are held throughout the year (for example every Tuesday morning in one town) along with seasonal markets (for example one Sunday in July). These markets are very popular and are highly appreciated by tourists.

Some products, primarily meat and cheeses, are sold directly by the farmer to the consumer with no intermediary in 'Farm Gate Sales'.

Other products (milk, live lambs and live calves) are collected from the farms by dealers. Some of the products remain in the LA, goats milk is processed into cheese within the area, but lambs are fattened at the boundary of the LA.

Local sales of animal products depend on the existence of appropriate local facilities such as slaughterhouses, or a cheese factory, even though a large proportion is made on the farm in the Cevennes summits and valleys) or on a milk collection network.



PDO = Protected designation of origin (in French = Appellation d'origine protégée - AOP)



PGI = Protected Geographical Indication (in French = Indication d'Origine Protégée – IGP)

Source of pictures

<https://www.fromages-aop.com/fromage/roquefort/>

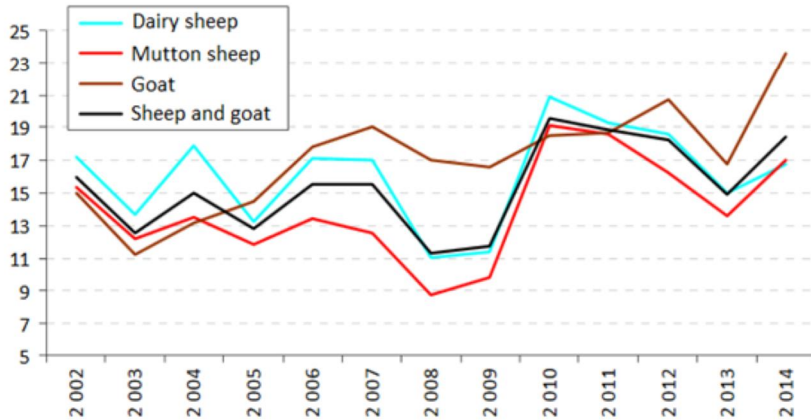
<http://pelardon-aop.fr/>

<https://flashmatin.fr/gastronomie/aoc-aop-igp-label-rouge>

<http://www.lozere-tourisme.com/agenda>

The policies and political driving forces

Evolution of net profit before tax per working unit in sheep and goat farms (thousand of €) - 2014



France

Source : SSP RICA

Subsidies are very important in agricultural income



Marketed volumes of Roquefort (source: INAO, CNAOL, 2014)



Difference of the total CAP's subsidies/farm between 2014 and 2015 (source G. Gautier, 2017)

Causses and gorges	+10151€
High Cevennes	+6139€
Cevenol crests and valleys	+1847€

French and European regulations, public policies

French breeders are very dependent on CAP subsidies (> 50% of their income comes from aids) and this dependence could increase with compensation for damage caused by wolves. Subsidies only linked to surface area tend to increase the size of farms, but this phenomenon is limited by the ceiling on aids per worker. Some subsidies are specially used in (and for) natural areas within the territory, like agri-environmental measures. Several subsidies that target mountain areas (Compensation for Natural handicap, French acronym ICHN) or aids for grassland have made it possible to limit rural exodus of farmers, thereby ensuring agriculture remains a major sector within the territory. Taking woodlands into account in the CAP avoided these areas being abandoned and helped farmers financially. The reform of CAP in 2015 was globally in favor of livestock systems.

Consequences of changes in pastoralism

During the period 1988-2010, intensification focused on the closest and best land: -17% of land under permanent grass but 36% additional productive grassland, 48% additional forage, an increase in the proportion of dairy sheep farms, an increase of the size of sheep herd (from 223 to 311); and abandonment of other lands (rangelands, woodlands), versus a decrease in the number of farms (-38%), decrease of Utilized Agricultural Area (-7%), 22% decrease in the number of goats and 77% decrease in the number of goat farms.

Financial means

The Cevennes National Park has improved the living conditions of shepherd by equipping summer pastures with shepherd's cabins, fences, night enclosures, even if wolves are complicating the organization of the summer pastures.

Quality approach and obligations

There are several quality labels whose specifications require extensive grazing of livestock, some of which also demand a certain level of food autonomy. These labels can limit the abandonment of rangelands but farmers who do not apply for the labels are free to do what they like.

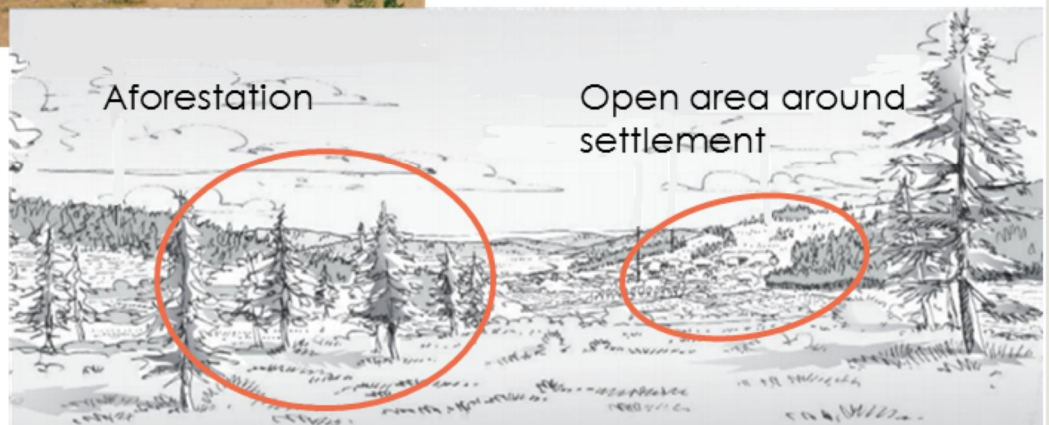
The landscaped development

Causses and Gorges

- Conifers are gaining ground over heathlands
- Pastoral and agricultural activities are only concentrated around farms
- Clapas and stone walls (built heritage) are hidden by vegetation



Invasion by scrubs on Causse of Sauveterre



The photograph shows the landscape as it is in 2017; the drawing represents a possibility of landscape under a 'business-as-usual' scenario.

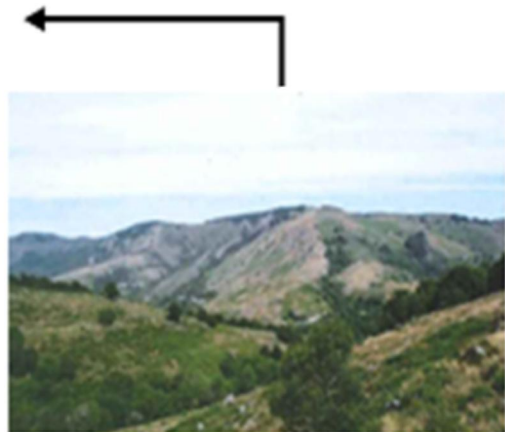
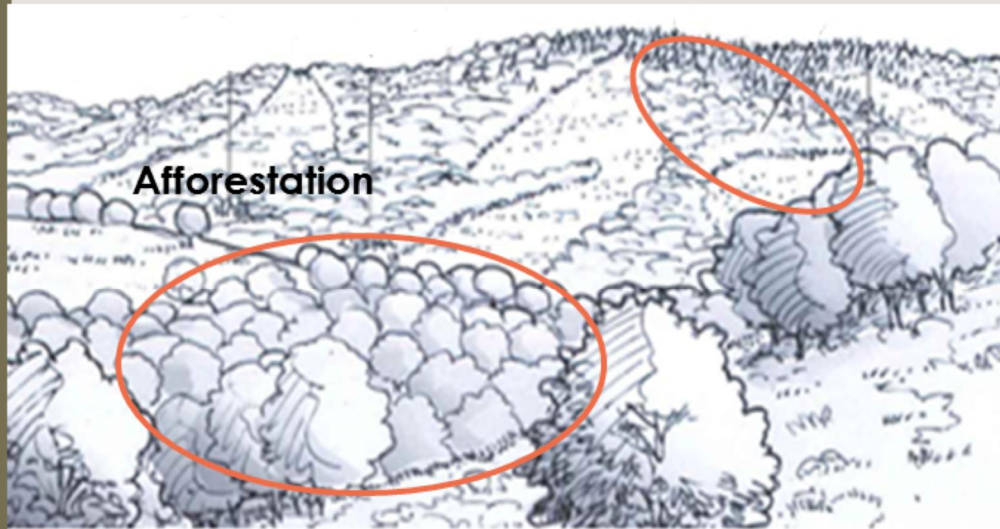
The landscaped development

High Cevennes – Mount Aigoual

- At the time of writing (2017) sheep and controlled burning keep the environment open.
- Cows are replacing sheep, broom and trees are closing up heathlands.
- Conifers and beeches are colonizing parts of the landscape
- Only some cleared areas persists



Aforestation on Aigoual



The photograph shows the landscape as it is in 2017; the drawing represents a possibility of landscape under a 'business-as-usual' scenario.

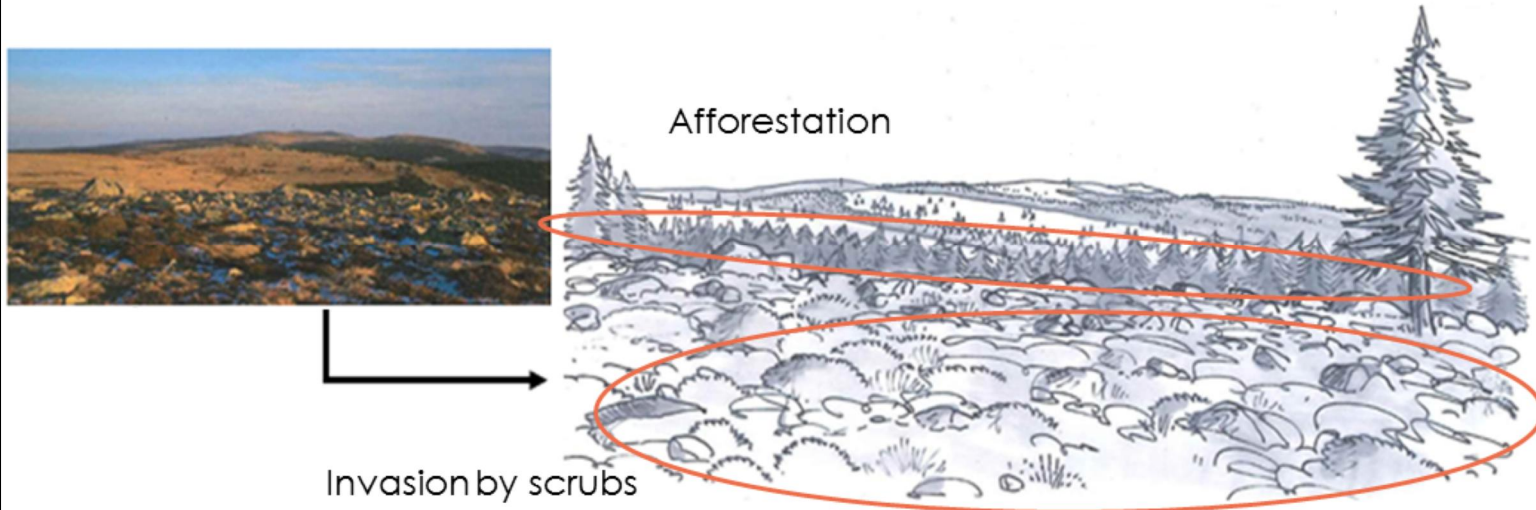
The landscape in the valley of Dourbie with extensive heathlands on the hillsides. This open landscape is maintained by grazing flocks of sheep and regular burning. When cows replace sheep and when there is a decrease in pastureland, broom and woodlands rapidly invade the landscape.

In 2050, assuming that pastoral activity decreases along with burning, conifers and broad leaved trees will cover most of the heathland. Only clearings will remain, so the circulation of herds and flocks will be increasingly difficult and consequently will continue to shrink.

The landscaped development

High Cevennes – Mount Lozere

- At the time of writing, heathlands and short rough grazing areas with some rocks remain.
- Important growth of conifer afforestation due to the rural exodus, there was a significant increase in land covered with conifers, reforestation and a decline in pastoralism.
- Open areas at the summits are becoming progressively fragmented by strips of woodland.
- Peat soils are endangered by the invasion of shrubs and drainage to create enclosures for herds of cows.

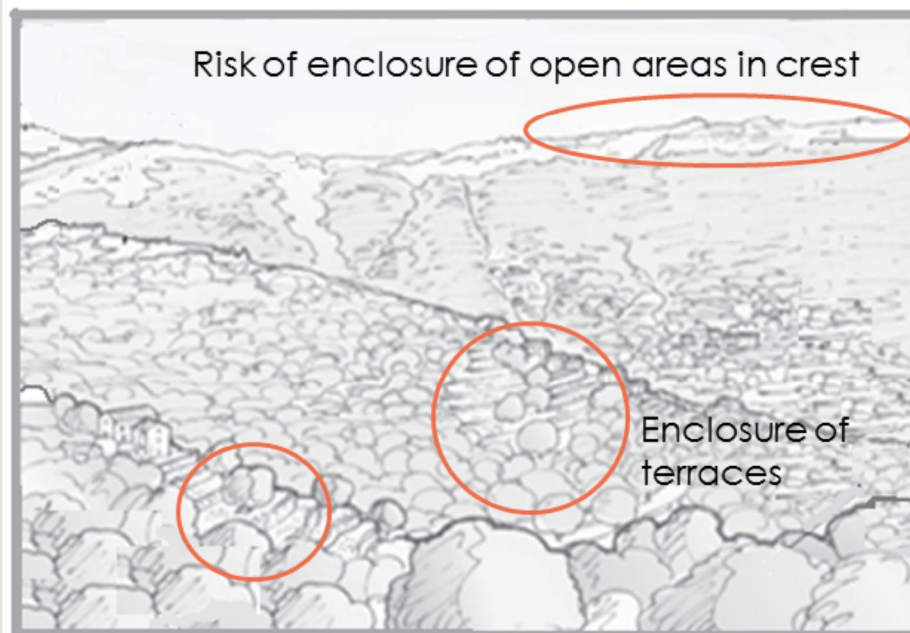


The photograph shows the landscape as it is in 2017; the drawing represents a possibility of landscape under a 'business-as-usual' scenario.

The landscaped development

Cevennes crests and valleys

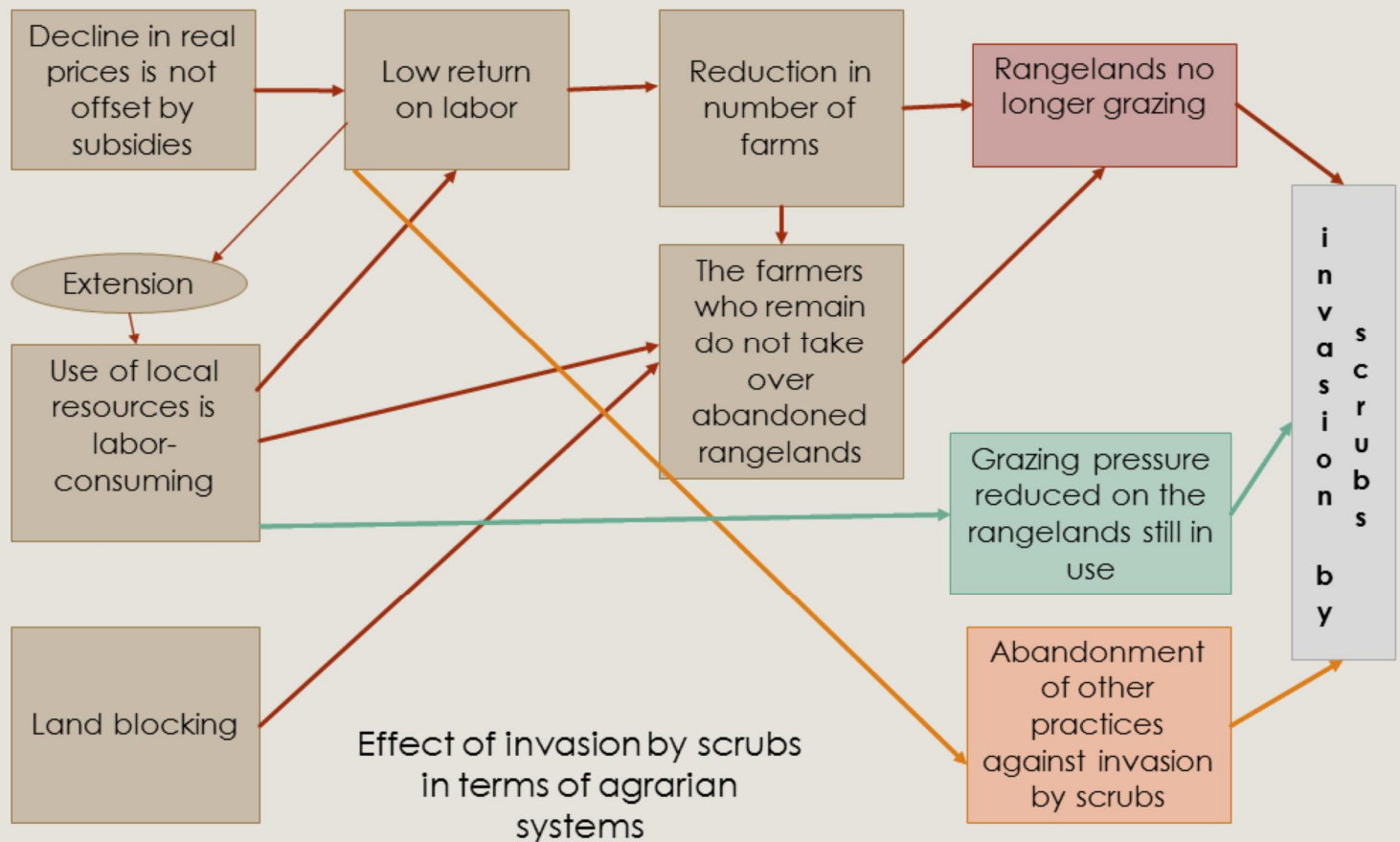
- Holm oak has colonized former chestnut tree forests on dry hillsides
- Heathlands and rough grazing have been invaded by shrubs and woods have progressively gained ground.
- Built heritage is being abandoned



The photograph shows the landscape as it is in 2017; the drawing represents a possibility of landscape under a 'business-as-usual' scenario.

The landscape in Trabassac valley has been very wooded with a dense cover of wild chestnut since its management has been abandoned. The terraces closest to the hamlets continue to be cultivated and heathland used for pasture links the crests and the settlements in the valleys.

Resulting consequences on land-use and biodiversity

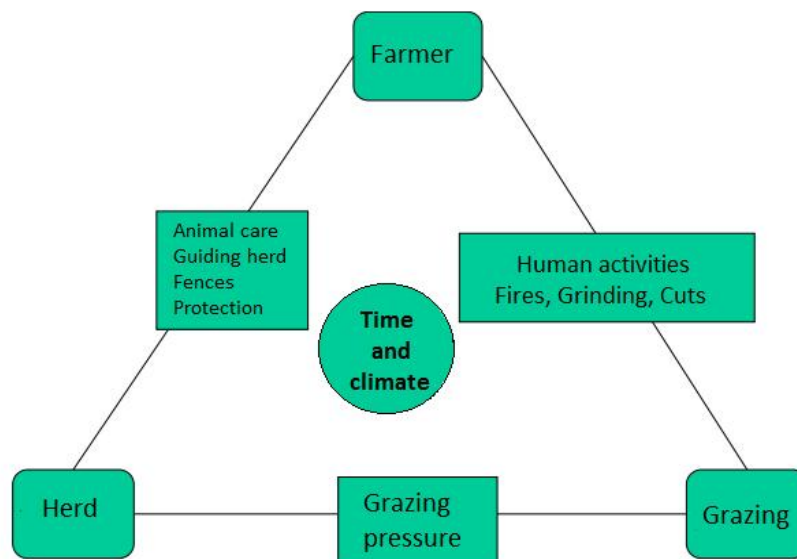


Grazing on rangeland is very time consuming (the shepherd has to remain with the herd and guide it to pasture) so the farmers who have remained do not want to take on any more rangelands. The result is that some rangelands are abandoned and shrubs invade the area due to the reduced grazing pressure. Due to land blocking (it is difficult to obtain land for pasture), so newly arrived farmers or farmers who remained cannot buy or rent these lands, which is consequently no longer pasture. The drop in real prices which are not offset by subsidies result in low pay for labor and consequently a reduction in the number of farmers. In the absence of sufficient labor, rangelands are no longer used as pasture.

The HNV vision

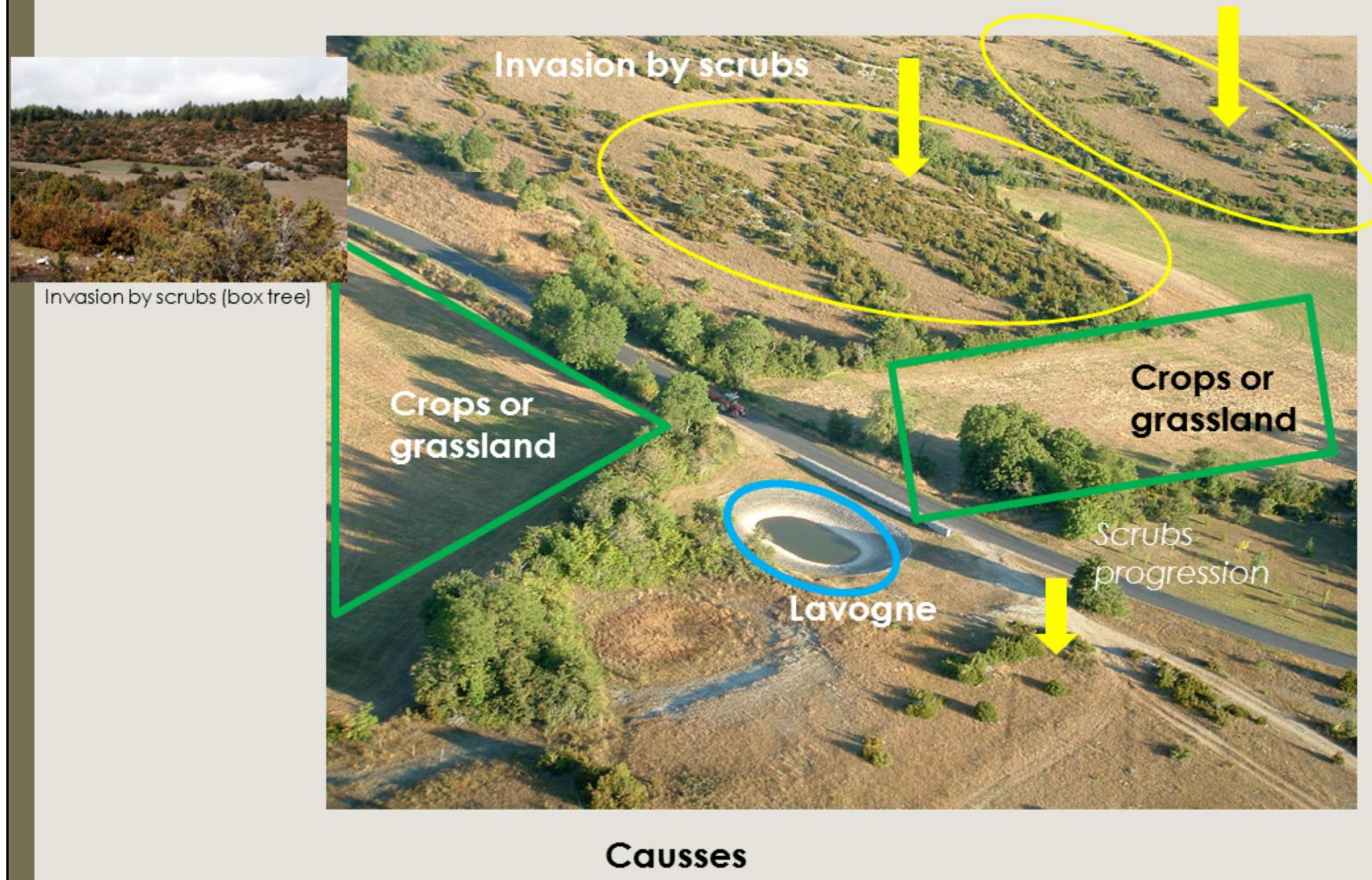
Managing biodiversity landscapes for a vivid society

Pastoralism is based on a triptych Farmer-Herd-Grazing which could be schematize as:



In the center, « time and climate » are really important and showed the place of climatic changes (so grazing changes too) and evolution of the herd (new ewes arrive, old ewe leave).

Biodiversity-rich landscapes : how will they function in 2030?



Intensification and abandonment are the two main phenomena in this sub-unit. In the Causses, agricultural intensification is limited to the vicinity of the settlements and includes plowing, the use of chemical products, big agricultural machinery, and an increase in herd size. The major risk is the abandonment of areas that are not productive.

Woodlands will gain ground and as a result, damage caused by big game will increase. The changes in the landscape caused by agricultural activities will disturb the bird populations.

Biodiversity-rich landscapes : how will they function in 2030?



Valley of Dourbie

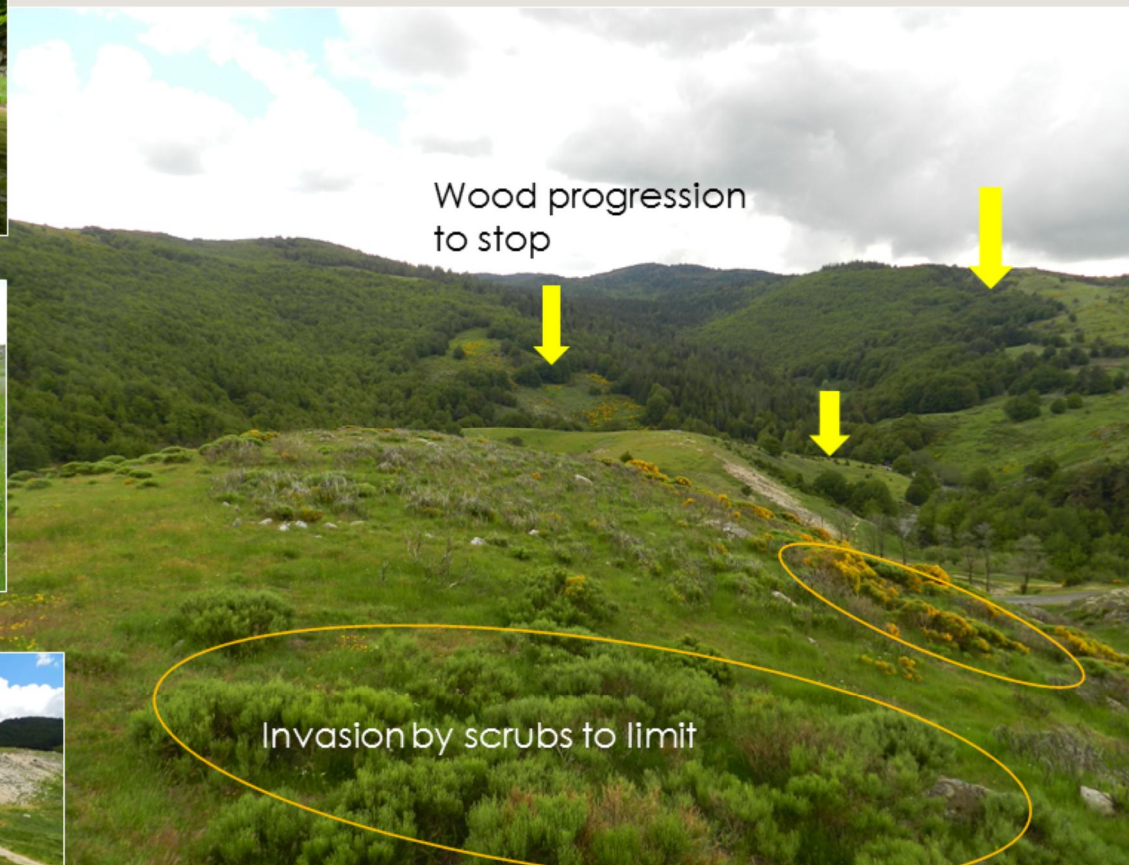


Summer pastures for sheep



Shepherd's cabin

Night enclosure



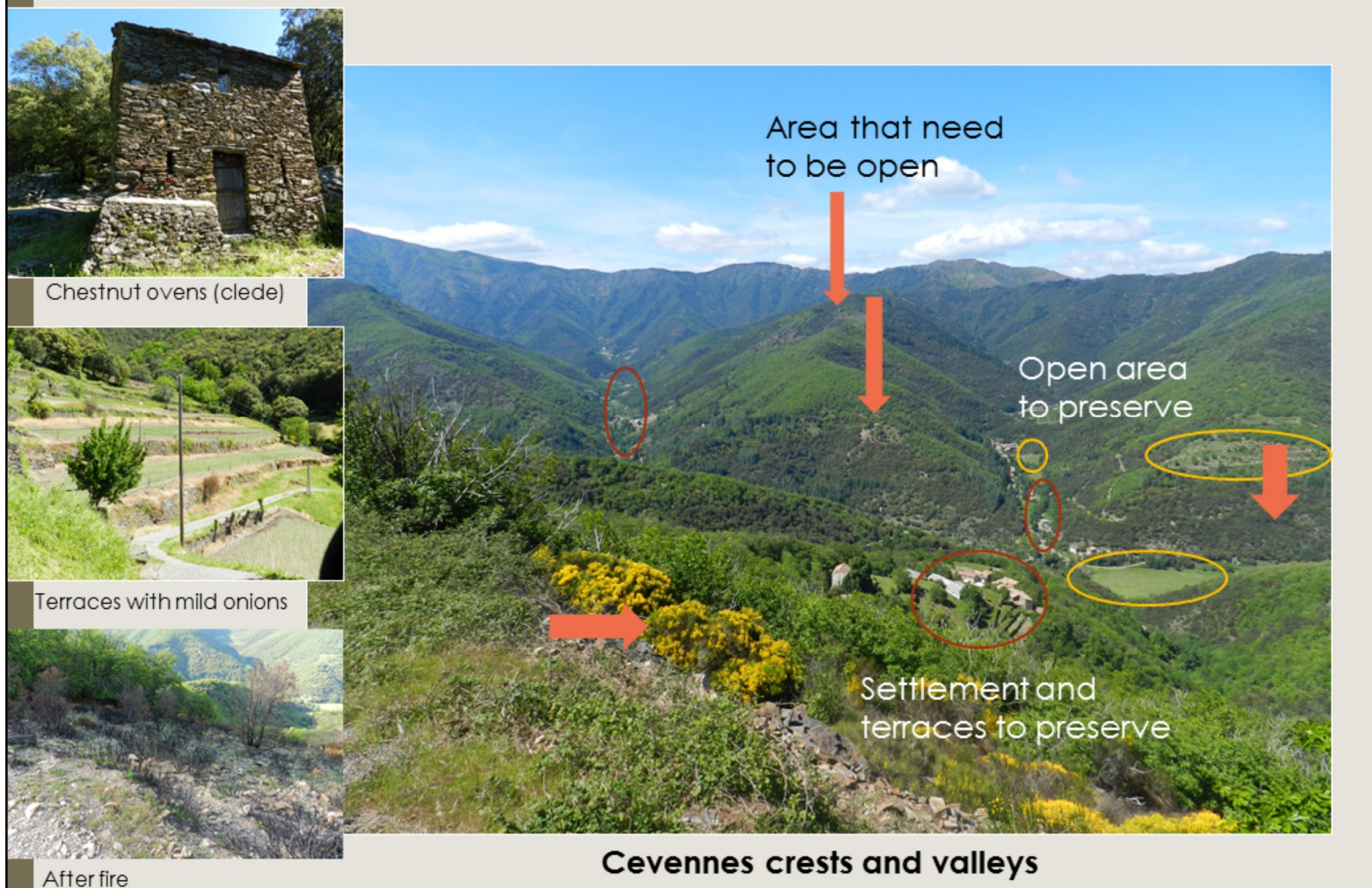
Wood progression
to stop

Invasion by scrubs to limit

High Cevennes – Mount Aigoual

As it is crucial to preserve transhumance, the actions undertaken by the Cevennes National Park and pastoral groups need to continue. If landscapes become more and more homogeneous, biodiversity will decrease. Agricultural intensification and drainage threaten damp environments. Changes are also taking place in ancestral methods, such as burning (previously only used in winter now also used in spring). There are also changes in pastoral practices (more fences and fewer shepherds) that favor the abandonment of less productive areas.

Biodiversity-rich landscapes : how will they function in 2030?



Landscapes are maintained thanks to grazing and human activities including felling trees, cutting scrubland (re-opening areas), and burning. It is important to maintain the built heritage including walls, houses, chestnut ovens (*clede*). From the HNV perspective, the landscape must be kept open and actions will have to be implemented to keep open areas, as shown by the arrows.

In fact, clearing woods is complicated because administrative authorization is required and obtaining it is not simple. It would be helpful to facilitate clearing and sylvopastoralism (combined use of logging and pasturing livestock in the woods). The exception made in CAP for oak and chestnut forest should also continue to encourage farmers using rangelands and woodlands and should be simplified in the future.

Another aspect that needs to be tackled in the future CAP is the need to focus help on small farms rather than on big ones. This will make it easier to keep herds and flocks small, which are easier to control on rangelands and in woodlands.

Farmers are the main actors who will manage these actions in the LA, but loggers need to be involved as do public bodies (municipalities, the Departments, and the state). It will be interesting to analyze the multifunctionality of livestock production but also the preservation of the landscapes for all the users of the territory.

SWOT analysis of the 3 territorial sub-units (1/2)

Sub-units	Strengths and opportunities	Weaknesses and threats
Causses and Gorges	<ul style="list-style-type: none"> - Development of cattle and horse farming - Extensive production - Many sheep breeders (therefore leverage in negotiations) 	<ul style="list-style-type: none"> - Intensification and extension of farmland - Conversion of rangelands into sowed grassland - Reduced use of rangeland - Threat represented by wolves - Threat of enclosure of the environment and the progression of woodlands - Is there a future for the dairy industry? - Issue of maintaining subsidies (agri-environmental measures)
High Cevennes	<ul style="list-style-type: none"> - Maintenance of transhumant herds thanks to a pastoral group (collective association for summer pastures) and the Cevennes National Park (French acronym PNC) - Arrangements for shepherds and herds (PNC) 	<ul style="list-style-type: none"> - Increase in cattle farms without transhumance - Agricultural Intensification - Issue of maintaining subsidies (agri-environmental measures) - Threat represented by wolves - Threat of enclosed environment and progression of woodlands - Issue of maintaining transhumance trails - Issue of pastoral practices (burning, fences,...) - Issue of damp environments - Issue of biodiversity and pastoral activities (wolves, Tetrao urogallus)

The Agro-Environmental and Climate Measures (MAEC) are designed to support farms committed to developing practices that combine economic and environmental performance or maintaining such practices when these are threatened with extinction. This is a key tool for the implementation of the agro-ecological project for France. These measures are be used to respond to the environmental challenges encountered in territories including the preservation of water quality, biodiversity, and soils, or the fight against climate change.

Finally, the last but not the least common threat is the risk of landscape enclosure and the progression of woodland. This threat is real and probably the biggest threat to our territory because it is already underway.

Causses and Gorges:

Large farms are using less and less rangeland: they have replaced shepherds by fences, they prefer giving hay and concentrates to their herd than pasturing them because pastoral feeding is very time consuming.

There are important questions concerning the future of the dairy industry with the evolution of the Roquefort sector, industry representatives and farmers will discuss milk prices among themselves (until now these were negotiated by a common structure and dairy quotas applied). The result could be that if future prices are lower, some farmers may quit Roquefort production and become intensive dairy farms without grazing (compulsory under the Roquefort specifications).

High Cevennes:

Transhumant herds continue to graze this area thanks to the creation of collective association of breeders who manage the shepherds, the summer pastures and the mixing of herds and thanks to the Cevennes National Park, which owns a large part of the summer pastureland and makes the necessary arrangements for the shepherds (cabins) and for the herds (fencing, night enclosures).

BUT weaknesses and threats nevertheless exist:

Already, there are sedentary cattle farms with a lot of fences. Sheep are better users of rangeland than cows. Cows damage the environment more than sheep because they are bigger and trample the ground more than sheep.

There is also a trend towards the intensification of land (rangelands become grasslands, fertilizer is used, stones are removed) and the impact of pastoral practices on biodiversity is sometimes questioned (burning, skidding, the use of fences), but these practices also make it possible to keep the environment open.

There is also a problem with maintenance of transhumance trails used by the flocks and herds because ownership is not clear.

Finally there is an issue concerning damp environments with the farmers questioning the Water Law and invasion by scrub-like vegetation which dry out these exceptional damp environments.

SWOT analysis of the 3 territorial sub-units (2/2)

Sub-units	Strengths and opportunities	Weaknesses and threats
Cevennes crests and valleys	<ul style="list-style-type: none"> - Many goat farms and sheep farms - Maintain extensive agropastoralism - Varied farming activities (mild onions, tourism, fruits) - Maintain heritage landscape thanks to growing onions - Possibility for the onion industry to become organic production - Future of the wood industry - Good opportunities for the dairy goat industry 	<ul style="list-style-type: none"> - Grassland at the bottom of valleys is reduced and endangered by urbanism - Damage caused by big game - Intensification with onion growing - Issue with lands availability and access - Threat represented by wolves - How profitable is the mutton sheep sector? - Issue of maintaining subsidies (agri-environmental measures)

Cevennes crests and valleys:

As there are many mutton sheep breeders and dairy goat breeders in the territory, they have considerable leverage when they need it (e.g. when they defended their practices in the CAP in 2015). They continue to use extensive agropastoralism or sylvo-pastoralism because of physical constraints of the environment. The local in-place agricultural economy is maintained thanks to varied farming activities (the cultivation of mild onions, tourism, fruit production, sweet chestnut production, etc.). These productions, especially mild onion, maintain the heritage landscapes as represented by the terraces and the use of water. In the future, there will be an opportunity to become an organic producer because of the social pressure.

There is also a promising future for goats cheese including Pelardon cheese among others.

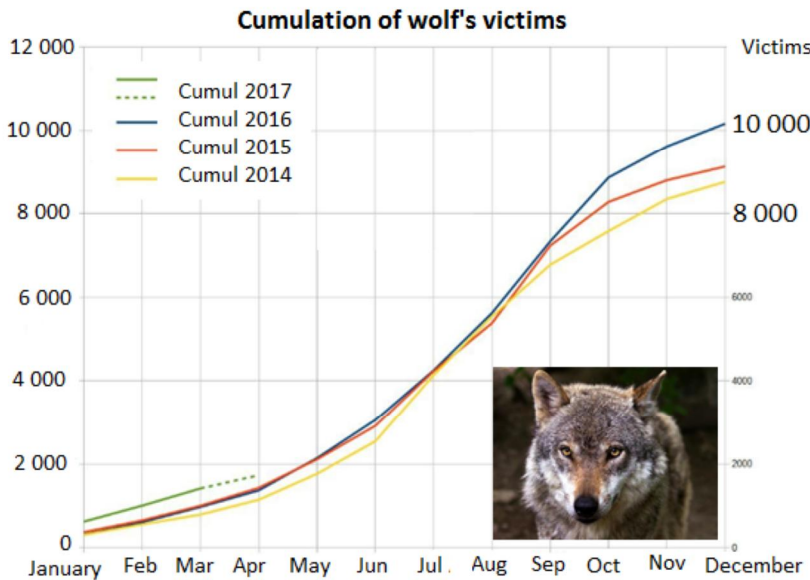
Finally there is an opportunity to expand wood industry in this area.

BUT there are also weaknesses and threats:

A lot of damage is caused by big game (wild boar, roe deer and red deer), which destroy the few available grasslands and the fences, and eat chestnuts and acorns.

There is a question about the profitability of mutton production and the associated facilities (slaughter house, agricultural cooperative, etc.).

What does need to be addressed for HNV vision?



Manifestation against wolf



Pastoral pact



Recommended actions for the maintenance or development of a HNV agriculture are the following:

1-Technical actions

- Analyze the conditions required to maintain extensive pastoralism and the valorization of the products, in collaboration with our partners.
- Support research projects on these themes and share our experience between countries.
- Help organize economic and ecological pastoral diagnoses to provide technical advice to livestock farmers through a dedicated body.

2-Adaptation of regulations

- Remove obstacles to pastoral clearing.
- Facilitate the recuperation of wooded areas through sylvo-pastoralism and clearing in the framework of agro-pastoral development projects.
- Define the sylvo-pastoral technical itineraries in the new regional forest and woods program and promote sylvo-pastoral economic and ecological interest groups.
- Assess the proratisation of basic payment entitlements in order to simplify its application.
- Defend the current system and upgrade it in the next CAP.
- Help small structures.
- Better target and adapt the agro-environmental and climate measures to real costs in order to promote best practices for the maintenance of open environments that are rich in biodiversity.

3-Future development of the pastoral sector

- Support the future development of the sector, in particular by promoting technical and organizational innovation.
- Pay attention to changes in the Roquefort specifications and to the dairy industry in general.
- Support initiatives that create higher local added value (organic farming, short value chains), particularly collective initiatives.
- Prepare a Causses and Cévennes brand label.

4- Support should be provided by local authorities including dealing with urban planning documents and the training of administrative officers.

5-Limit predation by wolves

- Wait for the development of methods of pastoralism adapted to the presence of wolves before considering developing it in the region.
- Exploit as far as possible, and even extend, all regulatory options to limit the introduction of this predator.

Source : CGAER report

(Source picture : <http://www.auvergne-rhone-alpes.developpement-durable.gouv.fr/IMG/pdf/infoloup14.pdf>)

Who are the actors to get involved in the process? How?

(Non-exhaustive list)



Organisation des Nations Unies pour l'éducation, la science et la culture

- Les Causses et les Cévennes, paysage culturel de l'agropastoralisme méditerranéen
- inscrit sur la Liste du patrimoine mondial en 2011



All the actors cited above are likely to be involved in an HNV approach but at the present time no collective approach has been built. There is only local initiative concerning the maintenance of an agriculture HNV.

Links and references

- Crosnier C., Granger C. 2004. *Le Parc national des Cévennes, la population rurale à l'épreuve de la gestion des milieux ouverts*. Environnement et sociétés rurales en mutation, approches alternatives.
- Aubron C. 2011. *Dynamique agraire dans les vallées cévenoles. Résistances spécialisées face à la déprise*. Working paper.
- Aubron C., Peglion M., Nozières MO., Boutonnet JP. 2014. *Démarches qualité et pastoralisme en France. Synergies et paradoxes*. Revue de géographie alpine 102-2.
- Aubron C., Noël L., Lasseur J. 2014. *Labor as a driver of changes in herd feeding patterns: Evidence from a diachronic approach in Mediterranean France and lessons*. Ecological Economics 127.
- Les Causses et les Cévennes, *paysage culturel de l'agro-pastoralisme méditerranéen*. Candidature à l'inscription sur la liste du patrimoine mondial de l'UNESCO. 2011.
- Le présent dossier de candidature a été réalisé par le département d'ingénierie patrimoniale i-pat® du bureau d'études GRAHAL sous la direction de Michel BORJON, par Mickaël COLIN, directeur adjoint, chef de projet, Laurent PAUTONNIER, adjoint au chef de projet, Laetitia JAQUEY-ACHIR et Marion BONVARLET, chargées d'études, en collaboration avec l'Association de valorisation de l'espace Causses et Cévennes (AVECC) et Gilles VILQUIN, graphiste designer, pour la mise en page et la réalisation de la cartographie.
- Dereix C., Guitton JL. 2016. *Pérennisation des pratiques agropastorales extensives sur le territoire UNESCO des Causses et des Cévennes*. Rapport n° 15 103. Conseil général de l'alimentation, de l'agriculture et des espaces ruraux.
- *Charte du Parc National des Cévennes* approuvée par décret n° 2013-995 du 8 Novembre 2013.
- *Charte du Parc National des Cévennes, Modalités d'application de la réglementation du cœur du Parc national des Cévennes* approuvée par décret n° 2013-995 du 8 Novembre 2013.
- Aubron C. 2014. *Histoire paysagère des vallées cévenoles. Une lecture en termes de systèmes agraires*. Séminaire « Jonction méditerranéenne agropastorale du Pinde : Histoire, patrimoine et projets », Kalambaka, Grèce.
- Atlas des paysages du Parc national des Cévennes
- DRAAF, 2013. *L'agriculture sur le territoire des Causses et des Cévennes*. Agreste - Données Languedoc-Roussillon.
- Entente des Causses et des Cévennes, 2014. *Paysage culturel vivant de l'agropastoralisme méditerranéen. Plan de gestion Causses & Cévennes 2015/2021. Construire un avenir commun...*. Approuvé en Conférence Territoriale le 4 décembre 2014.
- Entente des Causses et des Cévennes, 2014. *Paysage culturel vivant de l'agropastoralisme méditerranéen. Plan d'actions Causses & Cévennes 2015/2021. Construire un avenir commun...*.
- Lataste FG., Pigué V., 2016. *Case Study « Parc national des Cévennes » (France)*. Pegasus.
- Parc national des Cévennes, 2007. *Guide du naturaliste Causses et Cévennes. A la découverte des milieux naturels du Parc national des Cévennes*. Editions Libris.
- Creusat C., Forray L., Bossu C., Roney B. 2014. *Les chiffres clés 2013. Produits laitiers AOP*. INAO, CNAOL, ODG laitiers.
- Chapsal L., Danais M., Rigal B., 2016/2017. *Inventaire typologique et analyse de la vision sensible et culturelle des paysages vivants et évolutifs de l'agropastoralisme méditerranéen. Site UNESCO des Causses et des Cévennes*. Atelier pédagogique. Ecole nationale supérieure du paysage de Versailles.
- Gautier G. 2017. *Etude de l'impact des politiques publiques sur la préservation du Bien Causses & Cévennes*. Mission professionnelle DRAAF et Entente Interdépartementale des Causses et des Cévennes.

- Sites consultés :
- www.cevennes-parcnational.fr
- www.parc-grands-causses.fr
- www.causses-et-cevennes.fr
- www.gard.chambagri.fr
- www.lozere.chambagri.fr
- www.aveyron.chambagri.fr
- www.herault.chambagri.fr
- www.meteofrance.com
- www.race-aubrac.com
- www.races-montagnes.com/fr/races/
- <http://www.lacaune-ovitest.com/fr/la-cooperative/schemas-genetiques.php>
- www.geoportail.gouv.fr
- <http://atlas.cevennes-parcnational.net/paysages/>
- <http://www.auvergne-rhone-alpes.developpement-durable.gouv.fr/mission-loup-r1323.html>
- <http://www.caussesaignoualcevennes.fr/connaitre-communes/>