



Evolution of biodiversity policies on the territory of the Cevennes National Park (France): some contractual approach issues

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Abstract

National Parks constitute key elements of the French biodiversity conservation policy. The Cevennes National Park is an interesting case since it is the only one inhabited in its Core Zone and an important point is that the action of man is considered as having a quite positive impact on the conservation of biodiversity.

Since its creation in 1970, the Park developed many actions that can be ordered following four axes: action in favour of endangered species, ecosystems and landscapes, management of hunting, management of forested lands, and agriculture and breeding. In all these actions, a common evolution of the Park strategy can be identified: a move from command-and-control and direct action towards indirect incentive approaches.

A tentative interpretation of this evolution is suggested that tried to replace it in the general context of the European and French biodiversity policies. The main lesson is clearly the statement that the main local driving force is the continuous learning process, both on the socio-economic and the ecological dimensions, which, despite the loss of legitimacy of the State, allows the Park to improve the efficiency of its actions.

I Introduction

The first delimited and regulated land in Europe are probably related to feudality: hunting reserves aimed at preserving game resource and managing water and wood reserves. In France, during the 19th century the first national legal structures related to the “uses of nature” were established. “Forest artistic series” were described to designate trees excluded from standard exploitation because of exceptional qualities. By the end of the century “forest biological reserves” were created while the large national hunting reserves were already

constituted, namely in the massif of the Mercantour. The Law on the protection of natural monuments and artistic, historic or picturesque sites was voted in 1930. At the beginning, the protection of nature was mainly justified by aesthetic considerations.

The idea of creating National Parks then appeared as the result of the crossing of several policies: cultural, aesthetic, scientific and technical. It was strongly related too to the action of an administrative body, well established on the French territory: the Waters and Forests Administration (“Administration des Eaux et Forêts”), which, even before the National Parks Act, contributed to the protection of several sites.

At the end of the Second World War, France was one of the rare developed countries that had not yet voted any legislation related to National Parks. There were only Natural Reserves created and managed by the Waters and Forests Administration, or NGO like the Birds Protection League (“Ligue de protection des oiseaux”) or the National Society for Nature Protection (“Société Nationale pour la Protection de la Nature”).

The National Council for the Protection of the Nature was created on November 1946 and aimed at designing the statute of National Parks in France. The act instituting the National Parks was prepared by the Department of Agriculture and finally voted on July 22nd, 1960. The seven existing Parks were then created by executive acts¹.

The French policy draw some lessons from foreign experiences, namely the Park model initiated in the United States, in order to create its own National Park concept with a Core and a Buffer Zone. National Parks are public establishments whose policy is designed by a board of directors that gather representatives of several administrative bodies, local communities, staff of the park, academics, and specialists of the environment and the tourism. The Director of each Park is nominated by the Ministry of the Environment.

The parks have mainly been created in geographic zones with limited human activities, namely mountains massifs. The first objective is to protect not too widely transformed nature if not wilderness. Created in 1970, the Cevennes National Park (“Parc National des Cévennes” -PNC- see appendix 1) then appears as an exception since its core zone is inhabited by permanent residents. The population density is actually rather light, but the natural environment is profoundly transformed.

Its starting objectives of nature and landscapes conservation were conceived as a prospect where men only had a very limited role to play: they were likely to involve degradation processes that had to be supervised and countered by strict rules. The place of the man as an active and positive element of the evolution of ecosystems, and what was later called “biodiversity”, was taken into account only later and progressively. In the Cevennes, nature management is organized along three main objectives: the dynamic conservation of biodiversity and landscapes, the promotion of a rich cultural and rural heritage and the implementation of a sustainable development including green tourism. That has resulted in the evolution of PNC’s strategies at various levels. Several planning schemes are established periodically to organise PNC’s actions for four to six years, on the basis of the priorities adopted by the Administrative Council of the PNC and the opinions of its Scientific Committee. Today, one of these priorities appears to relate to maintaining the openness of landscape that are more and more threatened by the agricultural land abandonment and the progress of spontaneous forestation.

The objectives of this paper is to give a brief survey of the many actions undergone by the Park in order to protect the biological diversity on its territory, and to give some insight on the underlying rationales that lead to these choices, both in terms of objectives and policy tools.

From an historical perspective, we will show that many evolution can be analysed as a learning process. National Parks have been created with complex objectives and the genuine nature conservation is clearly only one of them. In the Cevennes, since a long time before the creation of the National Park, the relations of the Park’s structure with the local population have been the key variable to understand the strategic choices and the resulting conflicts. These relations both determined the nature of the conservation issues and the means used to answer them.

2 Strategic actions in favour of biodiversity conservation in the PNC

The strategic actions of the PNC for biodiversity protection widely relate to species and ecosystems. The management of hunting appeared very early as a specific cultural problem, crucial for the future. Similarly, the management of forested and agricultural areas led the PNC to elaborate strategies each time better targeted and adapted to the evolving context.

2.1 Species, ecosystems and landscapes

The Core Zone of the PNC is very rich in biodiversity. Since its creation, the PNC aims at characterizing this biodiversity, reintroducing recently disappeared species, preserving the natural ecosystems, habitats and landscapes. But since its creation the design of the tools to reach these goals evolved even if the objectives essentially remained the same.

2.1.1 PNC's actions on special interests habitats and species

The first action of the PNC was to inventory animal or vegetable species in order to establish the benchmark and identify what were the conservation priorities. The existing data were incomplete and disparate. Moreover precise and geo-referred localizations of vegetable species and their insertion in well-identified natural ecosystems, habitats or landscapes were missing. Only in the 80's, and even more in the 90's, the interrogations, in terms of biodiversity and landscapes, and methods able to answer them, have been taken into account. The installation of an Observatory of the Park in 1995 results from this inventory approach and aims at facilitating the implementation of effective and efficient management measures.

This approach allowed to take into account in the analyses, and according to a systemic method, the socio-economic aspects and the influence of human and practical activities, primarily of farmers and foresters. This is one of the reasons that engaged the PNC in participative approaches of sustainable management. One can thus notice that the evolutions noted in PNC's strategies as regards to the management of species, natural habitats, hunting and forested areas were accompanied by these researches, undertaken in close relation between PNC and some interdisciplinary teams.

Now, vertebrate species are rather well listed, but lacks remain for invertebrates and underground fauna. The stations of nonvascular plants still have to be inventoried. But the influence of agricultural or forestry practices, and more generally of human constructions and management ways on the various ecosystems and their evolution is still badly known.

A key mission of the PNC is to preserve the present species. But the difficulty is to supervise the factors that contribute to their presence. Regarding these issues, the strategy evolved. In a first period, from the creation of the PNC to the beginning of the 90's, the PNC mainly supports, when necessary, the preservation of this biodiversity: clearing of undergrowth, operations through contracts, purchase of plots it wished to safeguard...

In the same period, various research programs suggested, in partnership with farmers, to implement management ways more adapted to the preservation or the increase of biodiversity. For example, "LIFE-Nature" (since 1990), funded by the European Union, made it possible to specify the objectives and the conditions and procedures to reach them by taking into account the concept of natural habitats and landscapes, in particular on the Causses. More recently, the "Recreate the nature" national research programme, funded by the French Ministry of the Environment, proposed technical patterns for ovine stockbreeders in the Causses in order to preserve or rehabilitate open agro-pastoral lands that are more favourable to biodiversity, while ensuring farms viability. Thus the PNC can develop incentive actions more able to convince direct managers. But that does not exclude the necessity of following the effects of these presumably efficient practices in the medium and long run.

Existing species on the territory of the PNC

In the PNC, the 35 main kinds of ecosystems (forests, moor lands, steppes, meadows, wetlands...) and 200 kinds of natural habitats (more than thirty are listed in the Habitats and Birds Directives, or more generally in Natura 2000 areas) favour the presence of a great diversity of fauna and flora. Moreover, since the middle of the Eighties, about 270 000 hectares of Ecological, Faunistic and Floristic Interest Zones (40 000 hectares in the biosphere reserve) were identified (French classification for key natural areas: “Zones d’Intérêt Ecologique, Faunistique et Floristique”). Lastly, Important Zones for the Conservation of Birds were located.

According to the last inventory, of the 2 410 species founded in the PNC (Core, Peripheral Zone plus the biosphere reserve), 89 are mammals (on 135 in France), 208 are birds (135 nest there), 18 are amphibians, 17 are reptiles, 24 are fishes, 1 824 are insects (846 are beetles), 53 are spiders, 12 are shellfishes, 106 are gastropods, 26 are nematodes... According to IUCN’s lists, there are 4 species know as extinct in the wild, 42 threatened (11 endangered and 31 vulnerable), 18 rare, 14 with data deficient and 20 to keep watch. 29 species are listened in annexe II to the EU Habitat Directive (2 are priority species), 62 in annexe IV and 12 in annexe V. 48 species are listened in the EU Birds Directive (one is a priority species: tawny vulture). Finally, 229 species are protected through French legislation (law of 1976 for nature conservation).

Concerning the flora, about 2 200 vegetal species were listened in the biosphere reserve, i.e. 40% of French species on only 0.5% of the national territory. Of the 400 species protected in France, 33 can be found in the PNC (*Lilium martagon*, *Adonis vernalis*, orchids...). The PNC specialises in the conservation of 48 indigenous species and another hundred rare or threatened plants. A large number of the latter exist only in open lands (meadows, moors, prairies, pathways) that are maintained by cattle grazing.

2.1.2 Reintroductions of species

Very early the PNC was involved in a policy of reintroduction of species (tawny and black vultures, beavers, moufflons, grouses and crayfishes) formerly present and disappeared because of human predation, a too important hunting pressure or because they were classified as harmful species. The protection of ecosystems also helped the natural re-colonisation of several species such as otters, black woodpecker, owls, vultures, frogs etc.

The protection of the species pledged to characteristic ecosystems leads the PNC to work on the Core Zone of the PNC (much more rarely in the Peripheral one) on some threatened spaces, especially if the usual

Species reintroduced in the PNC

Vultures were reintroduced since 1970 by the PNC and the National Society for Nature Protection, relayed since 1980 by the French Funds of Intervention for Rapacious (“Fonds d’Intervention pour les Rapaces”). This operation was a great success² and 200 couples are currently counted. It also allowed the re-colonisation by tawny vultures (some couples remained in the Pyrenees) and created an important tourist promotion (from 15 to 20 000 visitors per annum) that had to be organized in order to ensure reintroductions durability.

Reintroductions of small grouses (French rooster) from 1975 to 1985 and big ones since 1978, emblematic birds of steppes, were carried out with much more difficulties. Because of the brittleness of these species and it is uneasy to ensure an efficient protection: predation is important (hunters are sometimes concerned in spite of the absolute protection concerning the big grouse in the PNC) and accounting difficult. In spite of a release of ten couples each year, the population drops locally and there are only more or less twenty couples.

Various birds pledged to the ecosystems of the Core Zone (some are listened in the Birds Directive, and the Core Zone is classified Special Area Protection) were reintroduced, for instance grey partridges, disappearing in the zone, and grouses. The majority of these species disappeared recently.

Other animal wetlands species such as otters (reappeared at the end of the Eighties) and beavers (reintroduced in 1977-78) reinstalled themselves because they are protected in the Core Zone. These actions are linked with the increasing interest of the PNC for wetlands in the 80’s: rivers, brooks, peat bogs, humid and non drained talwegs etc.

managers lose interest in them. It can for instance encourage the owners to manage their lands in order to protect the corresponding species. We will later see (section 2.4.) that the agricultural policy of the PNC strongly relates to this objective (the tool generally used is the “fauna” contract but the more recent Natura 2000 procedure can also be used). Finally, the PNC can be brought to acquire hot spots that are then protected and supervised by PNC’s agents; it is the case of some peat bogs for instance.

2.1.3 Landscapes

The chestnut-trees of the Cevennes (more than 120 varieties) make up a typical landscape. It is the product of a secular human activity in terms of space planning (terraces, systems of irrigation etc.) and management (selection, varieties grafting, implementation of specific cultural practices etc.). Beyond the revival of a typical and quality product, the conservation of varieties intra-specific biodiversity and chestnut-growing landscapes mobilize important tools since the Eighties. A support to researchers, to chestnut-holders with regards to the production, the transformation like marketing, and more direct incentives to the communes for landscape protection (within the framework of the Environment-Landscape Plans (“Plans Environnement-Paysage”) that are an initiative of the communes to protect landscapes through a limitation of forest progression, the installation of paths etc.).

The preservation of open lands on the Mont Lozère and Grands Causses, following “LIFE-Nature” and “Recreate the nature” programs, can also involve the intervention of the PNC, for instance through Local Scheme of Concerted Planning (“Plan Local d’Aménagement Concerté” or PLAC) such as the PLAC of the Causse Méjan funded by the Région Languedoc-Roussillon and the European Union and that aim at supporting projects and activities that use or arrange space and respect the natural inheritance. These actions often concern the agricultural or forest policy of the PNC. Implemented since 1992 and especially since 2000, they call upon a partnership more or less negotiated with farmers, foresters and private landowners.

This land acquisition or spaces control policy also fits in a prospect for constituting an ecological references network and major strong degree of wilderness or transformed habitats (patrimonial aspect, eco-systemic, ecological, specific or genetic and functional diversity), within the framework of European directives application. The specific issue of forest habitats management will be analysed later (section 2.3.).

2.2 The management of hunting

From the creation of the PNC, hunting is a key issue. A great part of the articles of the decree of creation relate to hunting³. Hunting is authorized today on the whole territory of the PNC except some areas more strongly protected that represent 15% of the surface. However, it is subjected to a particular monitoring that makes it possible to obtain a balanced development of hunting livestock, their conservation and that of natural environments, especially forests.

One can distinguish two periods in the evolution of the PNC’s strategy. The first one is dominated by regulations that allow the replenishment of game resources. Releases were associated to a very strict protection until the 80’s, through controls and even hunting prohibition. The PNC also maintained law and order and helped the clarification of eligible hunters population.

The replenishment of game resources, significant from the middle of the 80’s, makes it possible for each party involved to adopt at the end of this first period a more reconciling attitude. In this lapse of time each one progressed in the comprehension of the issues of sustainable and partnership resource management. PNC’s agents improved the dialogue with hunters and these became aware of resource abundance (7 000 wild boars and 300 stags shot in 1998 and 400 wild boars in 1970, for approximately 1 500 hunters).

It is enough to count hunters’ expenditures (from 2 to 4 000 euros per annum per hunter) and evaluate their receipts (Lundy, 2001) to realize the evolution of hunting and its economic impact at the local level (on the Causse Méjan game sales bring as much as ovine breeding). In addition, hunters have important tourism repercussions on the area that include hunting allowances paid to the State and trophies re-sale.

Reintroductions of game species in the PNC

In the middle of the 70's, the PNC proceeded to reintroductions of Elaphe Stags from wild origin resulting from breeding, disappeared at the end of the 18th century. These reintroductions, which also concerned roe-deers from 1976 to 1983, affected the Mont Lozère and the Bougès. Hunters associations also released.

From 1973, an Hunting Management Scheme is worked out by the PNC after a formal consultation of hunters. The Minister of the Environment decides hunting periods on proposal of the Administrative Council of the PNC (being based on the opinion of the Scientific Committee and the Hunting Commission). The implementation of this Plan allows the replenishment of hunting livestock thanks to releases of deer tribes and genetically tested wild boars.

Conditions to hunt in the Core Zone of the PNC

To get a hunting allowance in the Core Zone it is necessary to be resident of one of the 52 communes having a part of their territory in the Core Zone, or to be the owner (either a moral or physical entity) of more than 30 hectares in the Core Zone, or to be a first generation descendant (or the spouse) of an owner of more than 10 hectares in the Core Zone who lives in a commune of the PNC. Furthermore, a "stock" of 10% of the number of hunters corresponding to the "guests" and "historical" hunters is managed by hunters associations.

The success of the reconstitution of the wild fauna and the joint evolution of the spirits lead (oblige) to negotiate with hunters associations and control the resource together. Indeed, reintroductions made it possible to constitute a consequent number of great quality animals, but the growth of the species threatens the equilibrium of the forest and the damages caused by wild boars to some agricultural and forest land uses⁴, make it necessary to regulate their growth by hunting. Integral reserves are regarded as an additional source of risks for close timbering. Hunting Schemes for deers were thus established since 1981, in consultation with hunters associations, discussed and proposed to the agreement of the Minister who promulgates a decree for each hunting campaign. The consultation of hunters is not any more formal but the co-administration of the resource becomes gradually a reality. In addition, the Hunting Commission of the PNC welcomes representatives of landowners, nature associations and scientists specialized in wild fauna. Interns dialogue and collective training intensify.

2.3 The management of forested areas

The future of forests in the PNC was considered by its founders as naturally evolving. The very strong increase of set-aside lands in the 70's accentuated lands liberation. Private owners entrusted their lands to neighbour farmers when they still remained, or retimbered them with the assistance of the French Forestry

Characteristics of the forest in the PNC

More than 1 500 km² of forest cover the PNC (Core and Peripheral Zone). The forest occupies 63% of the Core Zone (about 58 047 hectares) in three stages: Holme Oak (up to 500 metres), deciduous woodland and chestnut-trees (between 500 and 900 metres) and beech woodland (between 900 and 1,500 metres). Two-thirds species are indigenous; The others are evergreens introduced in the area: 15 000 hectares of beech bush (3 000 hectares are mixed), and approximately 30 000 hectares of coniferous tree (Spruce, Pine with hooks, woodland Pine, Austrian black Pine and Laricio pine) in the Core Zone. There are also 4 000 hectares of chestnut-trees in the Core Zone (40 000 hectares on the totality of the PNC).

The forest is half private and half public in the Core Zone. In the PNC, the State owns 30 000 hectares and private owners 15 000 hectares. The really managed forest represents 33 000 hectares (25 000 ha are managed by the ONF). The preservation of the last natural beech and pine woodlands found on the northern slopes of the Mont Lozère constitute an important role in the PNC 's forestry management.

Funds (“Fonds Forestier National”). Moreover, the PNC encouraged afforestation in public forest. The French Forestry Office (“Office National des Forêts” -ONF), institution in charge of the management of public and publicly administrated forests⁵ belonging to local territorial authorities, was then considering itself as the most vouched for biodiversity management.

During the first period from 1971 to 1990, the PNC let the owners and the ONF act. It did not have a well-defined strategy, and just intervened when necessary, for instance to preserve an interesting forest (forest relics, particular tree species, pine of Salzmänn, Douglas...). With the ONF, the PNC kept the order, maintained the forests and receipted the public, even if they are two different institutions with different funding.

But, coordination issues arises in forest policies, especially related to the objectives of environmental protection, since the ONF also has an owner stake (a share of its incomes comes from the exploitation and the sale of wood) and did not always take into account PNC’s wishes. Conflicts born between the two institutions, even more because the ONF already had a hundred years of presence and experiment in the Cevennes when the PNC was created and constituted to some extend a competing “higher authority”.

For instance, on the Mont Aigoual where the existing forest results directly from the work of foresters by the end of the 19th century, the PNC owns 1 200 hectares and the State 17 to 18 000 hectares of forests on which the PNC cannot act as it wants but that it has to manage jointly with the ONF. This limitation of PNC’s prerogatives is awkward because two thirds of the Core Zone are public forest whereas it is the only area where PNC’s regulations apply.

A convention was signed between the two institutions for the management of PNC’s territory in 1990 by which, the ONF is committed to take into account PNC’s opinion and manage the forest according to biodiversity issues. This convention aims at providing a general framework of more ecological actions. It creates a compromise between an acceptable management at wood production economic level and the maintenance of a high biodiversity level: it takes into account the secondary productions and the various amenities of forests management. All modifications and works (public and private) are subjected to the acceptance of the PNC’s Director and the convention defines the cases in which the ONF can complete work without the authorization of the PNC (subject to the respect of the specifications envisaged). Then the ONF becomes a member of the PNC’s Administrative Council and the Scientific Committee contributes to validate ONF’s plantations in the Core Zone.

Since, the PNC tries to be in relation with the Regional Centre for Forestry Property (Centre Régional de la Propriété Forestière -CRPF), i.e. with the institution that represents private forest owners, and helps the implementation of the Simple Management Schemes (“Plans Simples de Gestion”) that give subventions to sustainable management practices in private forests. For farmers who cannot subscribe a PSG, an equivalent program called “country forest” is proposed. Probably, in the future, one can hope for a convention with the CRPF.

The stake of the collaboration between the PNC and the ONF is thus double: first the maintenance of plots in the long run to support some species with cuts regulations in some areas and second the implementation of contracts on ageing forest plots and the control of set-aside lands with a prohibition of afforestations (in particular on the Mont Lozère and the Causse Méjean).

2.4 The agricultural policy of the PNC

Three periods can be distinguished in the evolution of PNC’s agricultural strategy. In the first one, the PNC did not have any strong strategy and simply tied to facilitate the maintenance of farmers in the area. This vision corresponds to that of the Departmental Agricultural Professional Organizations (“Organisations professionnelles agricoles”) with which the PNC tried to maintain reinforced co-operation relations. Thus, one can note the implementation of the so-called “Mazenot contracts” (from the name of the prefect who devise them) to clear undergrowth plots or access paths and that represent an additional income: farmers are

remunerated for these tasks on the basis of estimate additional costs. The support to agro-tourism development and rural lodgings are ways to diversify the activities through an assistance for investments as well as for the purchase of local animal domestic races disappeared in the Seventies (Mérens horse, Raïole goat, Aubrac cow...) and related to the Cevennes' traditions. These actions aim at reinforcing the diversity of local livestock races adapted to the local edaphic conditions, as elements of biodiversity.

The Agricultural Commission of the PNC only had a blow by blow strategy and privileged the reinforcement of farmers incomes to maintain the agricultural activity, hoping that this will favour, in an indirect way, biodiversity preservation. Subsidies for investments (purchase of animals, fences, clearing of undergrowth...) have been distributed between farmers on a criteria of use and ecological management of ecosystems but without really being sure that the results are in conformity with the objectives stated in the specifications.

Gradually, during the 90's, conceptions evolved towards the use of agriculture as a tool in biodiversity management and an evaluation of the impact of PNC's specific actions in favour of the agricultural sector. Contracts more in relation with PNC's objectives of biodiversity protection such as the patrimonial contracts ("contrats patrimoine") appeared. Indeed, as quoted in the report on the evaluation of the PNC in the agricultural field (Inspection Générale de l'Agriculture, 1999), "*the publicly-owned establishment can with*

Characteristics of agriculture in the PNC

In the Core Zone of the PNC, one counted 120 farmers in 1970, 106 in 1980 and only 95 in 1999. There are 283 farms in the close periphery (most also own lands in the Core Zone). In the 52 communes of the PNC (186 500 hectares) and more particularly in the Core Zone, the evolution of agriculture is analysed in four areas: the Causse Méjan, the Lozère-Northern Bougès, the Cevennes-Southern Bougès and the Aigoual Lingas. The rate of disappearance of farms is very strong on the Aigoual Lingas (-82%), Lozère-Northern Bougès and Cevennes-Southern Bougès (-70%). The reduction of the total area of farmland in use is more accentuated on the Southern Bougès (-66%), relatively limited on the Aigoual Lingas (-20%) and weak on the Causse Méjan (-5%).

Milk or meat sheep farms dominate on the Causse Méjan; Sheep and caprine farms as well as chestnuts exploitation characterize the Cevennes and the Southern Bougès; Milk and meat bovine farms colonize the Mont Lozère and the Northern Bougès. The number of animals is maintained or increases. The evolution of set-aside lands is thus dependant to each area.

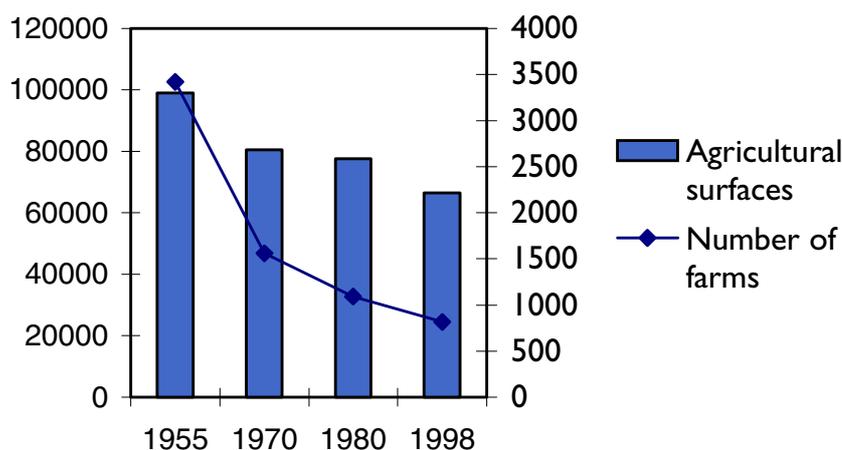
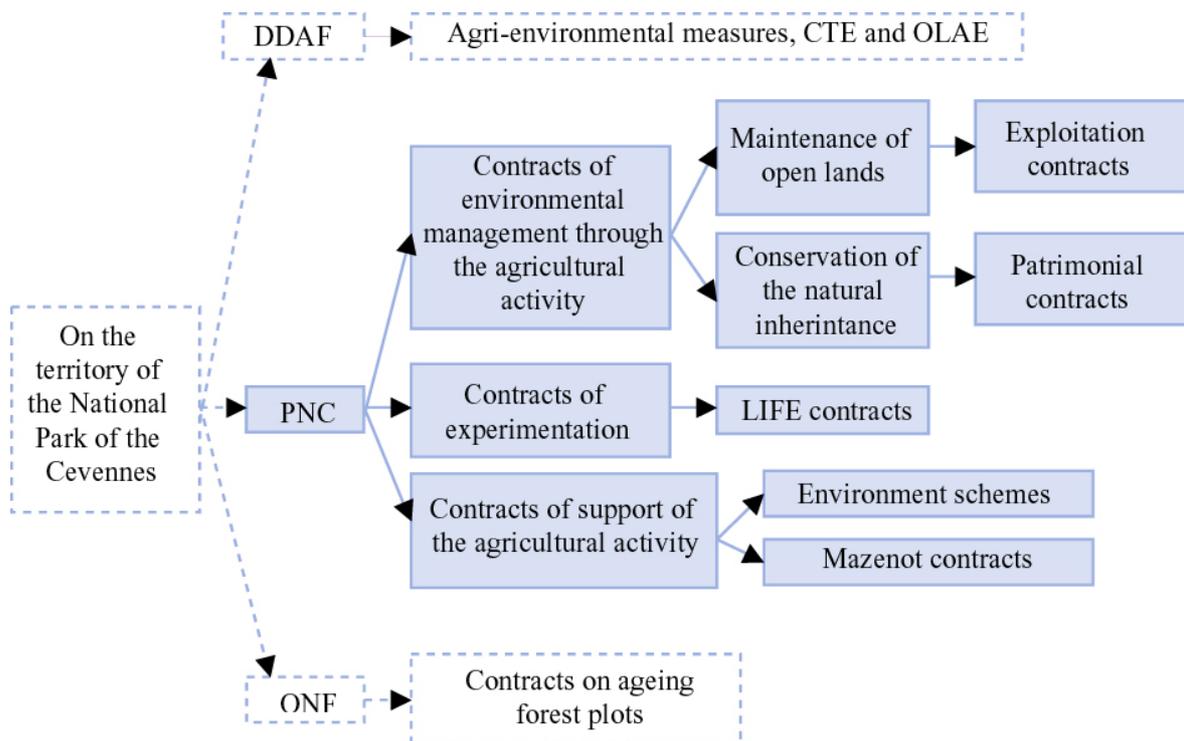


Figure 1. Number of farms and total area of agricultural land in use in the communes of the Core Zone of the PNC (180 000 hectares). Source: IARE, 1991.

the agreement of concerned owners and in connection with the DDAF proceed to operations likely to involve an improvement of agricultural and forested exploitation conditions”.

The PNC has thus vocation to support husbandries that contribute to the safeguard of key ecosystems, mainly wetlands (peat bogs), habitat of the Apollo butterfly, nesting zones of key birds and some raptors hunting areas. It primarily bases its contractual policy on its collaboration with farmers and stockbreeders. Through contracts, it aims at making possible for farmers to improve their system, diversify their activities (including handicraft activities) and, finally, improve their living conditions. In addition to the traditional agri-environment measures and their French variations, CTEs and OLAEs, and to Natura 2000 contracts, managed by the Departmental Direction of Agriculture and Forests (“Direction Départementale de l’Agriculture et de la Forêt” -DDAF), the representative body of the French Ministry of the Agriculture in the departments, farmers can contract directly with the PNC (see appendix 2): Mazonot contracts, farming contracts (“contrats



Maintenance of extensive breeding on the Massif de l’Aigoual and Mont Lozère

On the Massif de l’Aigoual, the PNC repurchased all properties on sale and that were on the way to transhumance. Stockbreeders then gathered and the PNC signed with them 30 years beams (with specifications on the type of management they must apply on these lands: conditions of hiring are established in order to encourage stockbreeders to have once again a pastoral use of these moors -a financial and technical support can even be provided- even if these specifications often are difficult to make), thus guaranteeing the continuity of the contract on the group and not only on one person. The PNC thus ensures a better control of space and stockbreeders can have decisions in the long run since they know that they are there for thirty years. Finally, in this area, the PNC owns 1 200 hectares and rents 800 to transhumants (more than 3 000 hectares its whole territory).

The situation was the same for lands located on the top of the Mont Lozère and on which a regular summer transhumance took place. But transhumance concerns 20 000 animals in the sixties and approximately 10 000 in 1977, and that was notably insufficient to maintain the quality of the lawns. In this case, the 18 bovines stockbreeders of the massif created a co-operative to rent the 1 600 hectares bought by the PNC and use them. Private lands were also rented in the vicinity, increasing by the same occasion the space available thus used for a modern transhumance.

d'exploitation") which can be regarded as a early forms of CTEs, environmental schemes ("plans d'environnement"), LIFE contracts and patrimonial contracts ("fauna" and "flora" contracts), and traditional tools of National Parks used in the PNC in favour of biodiversity such as pluri-annual pasture conventions ("conventions pluri-annuelles de pâturage") (see appendix 2.).

Two main types of contracts are used: contracts with obligation of means such as "fauna" contracts and contracts with obligation of results, increasingly frequent, such as agri-environment contracts complementary of DDAF's. Even if a priori there are no preferences for the definition of contracts between the Core and the Peripheral Zone, interventions are carried out especially on the communes having a part of their territory in the Core Zone. The most concerned areas are the Causse Méjan and the Mont Lozère which constitute the most open lands.

However, *"the lone preservation of exploitations is not enough for a good management of ecosystems, landscapes and biodiversity"* (Atlas of the PNC). The evolution of agricultural technical routes influencing the space management, the preservation of opened lands through the safeguard of extensive pasture is encouraged. Indeed the summit lawns are the result of several centuries of ovine and bovine transhumance and include species linked to these pastoral practices. However, concerning agro-pastoral practices, partnerships were not always easy because, for a long time, transhumants used pastures without contracting formally with landowners and thus did not have incentives to protect them in the long run.

The publicly-owned establishment acts in order to curb the increase of set-aside lands for twenty years and such permit to lose two times less farms than in neighbouring areas. Thus it contributes partly to the safeguard, even the restoration, of the quality of the PNC's territory. Various complementary operations, such as using gyratory crushers or clearing of undergrowth, are also helped (IARE, 1990).

Finally, the PNC leads some projects to install farmers. In general, it intervenes when these farms can be affected by economic projects that are not compatible with biodiversity preservation (especially tourism projects). When farms whose lands contain natural habitats remarkable for some species are released without transferee, the PNC purchases it and entrusts the exploitation to a farmer. This must take on the commitment to implement agricultural and pastoral practices compatible with conservation objectives identified. Thus a 500 hectares farm located on the Causse Méjan was repurchased and leased in 2001. A contract was signed and financial support, complementary of usual ones to mountain farming, are provided by the PNC as well as a technical support for environmental management of the plots. This operation is carried out in dialogue with the Chamber of Agriculture ("Chambre d'Agriculture", the institution that represents all the farmers of a department or a region). Altogether, since its creation, the PNC bought approximately 5 000 hectares of land. However, this management of the lands is not always correctly assured and thus poses problems with farmers who own an exploitation in the immediate vicinity.

Finally, the PNC supports actions that recognize the quality of the products and their geographical origin through labelling based on the fact that marketed products are obtained by respecting technical practices good for biodiversity, landscapes and more generally PNC's environment. This action consists in subsidies to an association rather than to a farmer but also in a support for financial engineering to gather all funding necessary to the implementation of the files relating to each one of these operations. It relates to organic farming and its role on space maintenance, the "PNC's Authentic" ("Authentiques du Parc"), including the production of range lambs (15 owners), "fat Easter ox" sold fattened at 3 years (10 owners) and endurance horses used as reproducers (9 owners).

This is only during the third period, which starts in the years 2000', that the PNC moved toward a more contractual way with objectives better defined and negotiated with farmers and the development, not yet completed, of an Agricultural Charter. It will comprise a general shutter of engagement recognizing that PNC's farmers are in a protected space and committed to take into account the problems of biodiversity, landscape and nature preservation, but that they are also confronted with constraints of economic viability. A second shutter, more technical, will specify the good practices and methods of a contractual policy with counterpart a financial support of the PNC. In parallel, the PNC will continue its efforts to encourage the supply of quality products, including wood, whose PNC's origin can be certified. More generally, this Agricultural Charter explicitly recognizes the role of agriculture as a management tool of biodiversity.

Finally, on the various dimensions of the PNC's actions for biodiversity conservation, a global evolution can be observed from direct actions and administrative regulation towards incentive policies and the building of partnership with other institutions and concerned population groups. In the following section we analyse these facts and their economic meaning.

3 On the economic meanings of partnership emergence

Following the general evolution of environmental and nature conservation policies, PNC's actions in favour of biodiversity moved, since its creation, from a heterogeneous set of direct conservation measures towards a tentatively better integrated sustainable management. In this move a parallel evolution of the objectives and the means can be observed. This report leads to several questions. What is the meaning of this evolution? How to analyse its efficiency, both in terms of coordination and incentives? Is this evolution completed?

Several reasons can be suggested that explain locally the observed changes. A more precise analysis of the contract mechanisms actually used there will enable us to advance some elements of conclusion.

3.1 From direct actions to incentives and partnership

Following the four axes on which the PNC's biodiversity policy is developed, a rather similar evolution can be observed. At the first stages, the action was essentially direct: the PNC created regulation that framed the behaviours of various categories of agents (hunters, foresters, farmers, tourists...) or made the things by itself (bought and managed some land, carried out species inventories, reintroduced endangered species...). Then several management agreements with other institutions involved in environmental and biodiversity conservation were negotiated and signed. During this same period, the PNC seeks to encourage private actors, in particular through contracts. Lastly, it is today more and more interested in private actors groups and seeks to draw up more global conventions with them, by activity.

3.1.1. The evolution of PNC's policies: some facts

Even at this early stage, the relation with local actors, that had often not seen the setting up of a new public structure on what they consider as their territory, had to be improved. Since the incomes were mostly quite low and the beneficiary activities partly seasonal, the so-called "Mazenot contracts" aimed at joining environment and landscape maintenance, on one hand, and complementary income on the other hand. Then, step by step, the idea of joining the two ranges of objectives became more and more a structural characteristic of PNC's actions.

This new way of establishing relation with actors is clearly more appropriate when it appears more and more obvious that most agents are "multi-objective". They must, of course, comply with all the rules and regulation, set by the PNC or any other public body. They are obviously interested in maintaining or developing their income and, finally, their welfare. This last point is actually the more interesting one since the various arguments of their welfare function vary widely with each agent. For some agents, the environment and biodiversity protection is very clearly the function of public bodies and, more especially, of the PNC. Some others are willing to contribute to the production of this public good, since they consider themselves as concerned consumers.

At the current stage of this evolution, two main points must be reported. The first one relates to a wider and wider use of contracts mechanisms to establish common objectives with agents, mainly farmers and foresters, and, to some extent, hunters too. Contracts mechanisms, better than undifferentiated subventions, appear as a practical way to join environmental and income objectives. On the other hand, the PNC is establishing conventions with other governmental institutions, such as ONF, or representative organisations of agents (Chamber of Agriculture, hunters associations...) in order to define common objectives before defining the

policy tools, namely the contracts menu, that will be set up towards agents.

These facts being reported, two questions can be addressed. At a first level we have to try to better understand why is the PNC acting this way and how this evolution is explained and construed by its staff? As analysts, we must then try to assess in which way it is efficient?

3.1.2. *The evolution meaning*

In the economics literature, many reasons can be found to explain the superiority of incentive and co-ordinated actions on regulation and non co-ordinated policies. Actually, the question is often to understand why is there still so many non incentive policies. The basic answer lays in the classic Coasian analysis : transaction costs and practical difficulties to define appropriate rights. When analysing the field practices on the PNC's territory, and analysing the explanations given by its staff or other local administrative executives, several motivations appear as significant.

The first one is probably information both for asymmetry and completeness issue. Obviously, during all the first period, when Park's policy consisted mainly in direct action and regulations, many tensions existed with the local population and several concerned groups facing poorly anticipated and, to some extent, poorly adapted constraints (hunters, foresters, farmers or stockbreeders). The point is probably not mainly the informational rent of the private agents, but the question of commitment: the Park's policy was probably not perceived as enough secured, not enough understood, probably not sustainable, and, finally, not really legitimated. Then, the main interest of the incentive approach is that, practically, it constitutes a symmetric incentive to the Park and other administrative bodies to acquire a better information on the wishes and possibilities of the agents to change their behaviours. As it will be analysed in the next sub-section, the incentive approach is to some extent symmetric since it leads the principals to search better *a priori* information before they get more through the contracting mechanism.

Another reason is obviously the fact that incentive and, namely, contracting approaches allow the agencies to join together two of the main objectives in the zone: protecting the environment and biodiversity, and bringing new income opportunities. Maintaining the population on the territory was, since the beginning, strongly related to the opportunity to help farmers to improve their income in order to make them stay in the rural areas. This was one of the main objectives common to the PNC, the Chamber of Agriculture and the DDAF of the department of Lozère (Chassany and Miclet, 2003). One way for that purpose was the development of tourism. Tourists may constitute a significant source of income through several kind of expenses (hotel, restaurants, local shops, tourism events); but the more significant for joining the two objectives was probably the development of "green tourism", especially the increase of "rural lodging" that supported contacts with local people and, by the way, incite farmers to improve the quality of environment and landscape in the vicinity of their farms.

More generally, contracts were appropriate tools to link explicitly complementary income to the respect of environmental constraints and ecosystems conservation. The main point to stress is the frequent existence of several contracts with several institutions (all public bodies!) that were often proposing alternative and sometimes contradictory objectives. The main opposition was often between environmental friendly contracts versus productivity improvement incentives and explains why the establishment of a convention with the ONF and the agricultural administration were so important since they helped at diminishing these contradictions (see next paragraph)⁶.

The last important point is probably the more interesting, since it expresses a change in the conception of the relation between human activities and biodiversity conservation. The fact that the territory of the PNC, including its core zone, is constituted of profoundly transformed ecosystems was already emphasised. It was said too that the existing biodiversity on this territory is, to a rather large extent, dependent on the maintenance of these activities. If it is remembered that the general socio-economic context in all French⁷ mountain areas is agricultural land abandonment, the logical consequence is that the local biodiversity was in fact mainly threatened by this decrease of human activities.

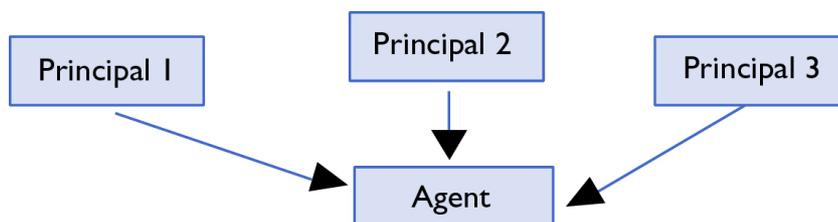
Rather paradoxically it appeared that there was sometimes a real convergence between the two apparently opposite objectives of biodiversity conservation and productivity improvement. The explanation lays in the report that without productivity improvement, farming and breeding practices were losing their competitiveness in the CAP context and would have been abandoned. It is then needed to search a compromise between these two apparently contradictory targets.

The preliminary conclusion is firstly there that in the local context of transformed ecosystems, the maintenance of human activities, as far as they are kept in appropriate technological limits, is necessary to the conservation of biodiversity (and namely the kind of biodiversity preferred by policy executives). Progressively, the impact of human activities on the conservation of biodiversity was no longer negatively perceived. It became an element of the “anthroposystem” that appears at the core of the conservation strategy. Secondly, this situation implied clearly that agreements were to be found between the institutions in charge of the various public policies implemented on the Park territory.

3.1.3. Managing the multi-principal issues

Multi-principal issues arise when several authorities are implementing pluri-objectives incentive policies towards the same agents. The solution may lay in the signature of convention between the principals that aim at improving the consistency of the incentives. For a better understanding it is convenient to oppose the situation without agreements and the resulting situation after the signature of the appropriate convention.

Before the signature of the conventions with the other institutions, the implementation of contracts can then be regarded as involving several principals (the PNC, the ONF and the Regional Centre for Forestry Ownership, the DDAF and the Chamber of Agriculture)⁸:



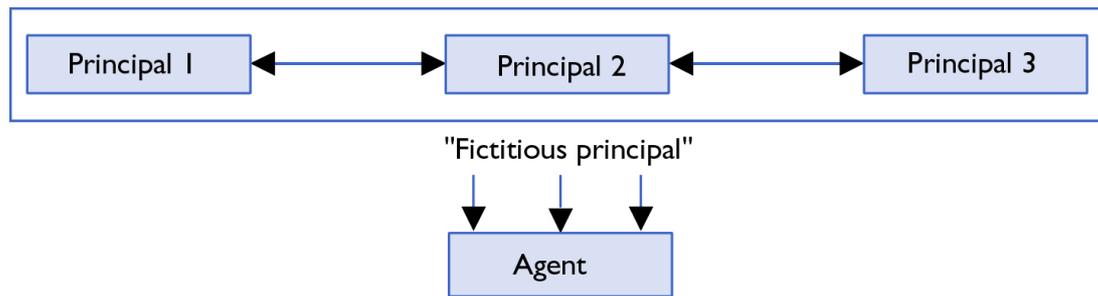
The main question then becomes to know whether the activities the agent is committed to carry out for the different principals (Martimort, 1992) are substitutable or complementary. The problem is essentially substitutability since we consider only contracts related to biodiversity protection. According to D. Martimort, in the substitutable case, there is only one increasing monotonous solution, but we are not going to characterize it, since the signature of the conventions resolves our problem.

Indeed, the difficulty that arises in multi-principal case is that an agent can contract with several principals, on same surface, for the same practices... Thus, inefficiencies appear, as highlighted by D. Martimort in its chapter 5: “for the principals, the non-cooperative situation [decreases] their expected welfare” and it is then necessary to co-ordinate the actions between the various agencies involved in nature protectors, possibly through contract among them, or more precisely conventions.

After the signature of the conventions, the tasks and prerogatives of each principal are well defined, and thus, the principals must be considered as subdivisions of one sole principal called “the fictitious principal” (Martimort, 1992 ; cooperative case):

The next sections of this chapter will be dedicated to the sole contracts managed by the PNC. For more information on other contracts signed on the territory of the PNC but with the other principals, the reader is referred to Rutagungira (2002).

The principal is in charge of designing and proposing the contract and the agent can accept or not. If he is



interested, he will have to carry out some sort of task. The result depends on the effort of the agent, but also on a random variable. Then, two types of asymmetries of information situations can occur.

The problem of “adverse selection” or “hidden information” arises “*when the agent has some private knowledge about his cost or valuation that is ignored by the principal*” (Laffont and Martimort, 2002). Indeed, in the case of agri-environment contracts, farmers know the cost of compliance with the principal’s contract, since each exploitation has its own characteristics in terms of farm size and structure, site history and position, natural resource endowment... But the principal does not.

As a consequence of the learning process that we highlighted, the PNC is able to reduce the adverse selection since it knows the agents who are the most favourable to it and therefore to biodiversity protection. The adverse selection issue should then disappear, but, in fact, the PNC does not have the legal possibility to differentiate transfers to farmers in a unique contract and it must use the menu of contracts offered as in the adverse selection case.

The other type of information asymmetry is the “moral hazard” or “hidden action”. This question arises “*when the agent can take an action unobserved by the principal*”. In our case, there is no real problem of moral hazard since the PNC inspects almost the totality of farmers (contrary to the DDAF that inspects only by some 5% of them per year). It has for this task trained guards who know the rural socio- and ecosystem since they live there permanently. But this great quantity of inspections is not related to a maximization of the use of funds but rather on a will of the PNC to reduce the possibilities of cheatings (Rutagungira, 2002). The moral hazard issue could nevertheless be studied in order to determine the ideal contract allowing to minimize information and monitoring costs (see Moxey and White, 1998). Actually, a double moral hazard issue can be identified since the PNC also sets up its own policies of biodiversity protection. The main question then becomes to know who is creating biodiversity (which moreover, as one knows, is difficult to assess) and the PNC can have interest not to reveal exactly what it observed. The question of the distribution of benefits then becomes central. In this case, the PNC’s efforts of inspection cannot be considered as observable and adds constraints in the principal’s maximization programme “*to incite it ex-post to choose the level of effort of announced control*” (Macho-Stadler and Pérez-Castillo, 1991).

Actually, at this stage of our work, the only point that must be emphasised is that the signature by the PNC of conventions or other types of co-ordination tools with the other actors, either governmental institutions or bottom-up organisations of concerned groups, appears as an efficient way to improve the efficiency of its strategy towards biodiversity. At least, it is easy to construe since it directly suits what is suggested by the more recent literature on multi-principal issues.

Nevertheless, the efficiency issue is still addressing several questions that must be answered. The first one being to get more precise results of the choice of the “support” for contracts with the agents : production quantities are not necessarily the more appropriate one.

3.2 Study of contracts

During the second half of 2001, 44 contracts have been signed. A great variability is possible in their definition because, if there are ten standard contract forms, there is no obligation to follow them. However, as we will see, the menu of contracts offered by the PNC is not sufficient to encourage the agents to contract according to their “type”.

Contracts are generally carried out on small surfaces. They can be of very variable duration, according to farmers’ individual strategies even if, those we studied were generally signed for five years. The actions they are developing on are very targeted: contracts are signed in their great majority with farmers (between 80 and 90% according to PNC’s agents). A large majority of PNC’s actions in favour of the biodiversity are thus studied by the Agricultural Commission of the PNC.

These actions fall under a design of the management of natural habitats and landscapes where the local actor (farmer, forester...) appears to be essential for the safeguard of this type of biodiversity.

3.2.1 Method, ways of identification and information of the targeted actors

Until the end of the 90’s, financial assistances primarily came from individual requests (farmers initiatives). Today, the PNC defines a collective project before implementing contracts, in connection with CTEs. The PNC seeks synergies between the existing activities and its own objectives. The first contact in the contractual relation can be from farmer’s as from PNC’s initiative. During the first period, the farmers usually avoided to take any initiative toward the Park. With the Agri-Environment Measures they came to work with the Park that appeared to act in accordance with the DDAF for the implementation of the farming contracts.

PNC’s point of view: there are GIS (Geographic Information System) which can be used before any negotiation.

Farmers’ point of view: farmers raise a lack of transparency, even if they do not feel a lack of information on the PNC and its activities. The guards appear to correctly fulfil their managerial role but are confronted to decisional problems that are within the Director’s province. Farmers indeed perceive some inconsistency in PNC’s management in the long run that contributes to reduce its credibility⁹. They feel that some decisions are imposed without preliminary dialogue and, once carried out, are not always followed or continued and that decisional choices are arbitrary. This behaviour was at the origin a demonstration of hostility of some farmers who are not willing any more to dialogue and negotiate.

Farmers also raise a problem of listening. Interlocutors are not always available to answer their requests when difficulties arise, in the execution of contracts for instance. In addition, they seem to wish their know-how and knowledge of ecosystems to be better taken into account in the definition of the measures taken by the PNC, within contracts’ framework as in the regulation of the use of the resources (especially in the management of hunting). They ask for a partnership in the design of the contracts.

3.2.2 Selection of the candidates

PNC’s point of view: whatever the contractual relations, the PNC privileges relational dimension. Contracts are primarily proposed to farmers with whom PNC’s agents think it will be possible to work. The PNC thinks in terms of “*potentially favourable situations*”.

Farmers’ point of view: the choice of the partners is strongly constrained by the perception farmers have of the PNC. Moreover, ewe’s milk producers who provide Roquefort, even if they are located in the Core Zone, do not need subsidies and are thus not interested by the contractual approach. Other farmers who live thanks to subsidies are better disposed to accept contracts and listen to the PNC.

Three main types of potential contractors can thus globally be distinguished: those who are a priori favourable to the presence of the PNC and its method, in particular in terms of biodiversity protection, those who are rather opposed to the PNC and its policy, and finally the unconcerned.

3.2.3 *Terms of the contracts, nature of the incentive*

The main constraint for the signature of the contracts by the PNC is that of the working time in diagnosis and monitoring. At the beginning of the contractual approach difficulties arose in contracts formalization and negotiation experiment. Farmers were more accustomed to sign contracts than PNC's agents.

PNC's point of view: the PNC has a very broad contractual capacity within its budget¹⁰. The Director can sign contracts with private or public agents. The PNC also has a great autonomy of action: it has a budget of a little more than 76 000 euros per annum to sign contracts with farmers (the specific budget affected to agriculture is approximately 122 000 euros). The planning scheme determines the limits in the definition of contracts and the assignment of PNC's fundings is more or less free even if it is made in dialogue with agricultural actors via the Agricultural Commission (very little money is actually directed towards forests). Funding and co-funding are carried out when there are not other possibilities of subsidies. Contracts objectives are defined by sector related to patrimonial species identified through inventories.

Farmers' point of view: the base of the contract consists in a standard contract that is adapted to the particular case of the concerned farmer. The difficulties raised by farmers come primarily from reserves about the wish of the Park staff to intervene in the farming choices, namely the dates of harvest, or differences in diagnosis concerning the role and the frequency of burn-beating and utilization of gyratory crushers.

Farmers ask for a simplification of contractual procedures. The standard contract for Mazenot contracts is often quoted as an example by farmers whereas they may be abandoned. The role they fill is built-in in exploitation contracts that include investment for the safeguard of country roads and open lands (utilization of gyratory crushers, burn-beating etc.).

Another problem is that of deadlines of compensation payments envisaged by the contract and the lack of dialogue relating to some constraints not specified directly in the contract but to which the payment is subordinate. The PNC is shown "to misuse" the goodwill of farmers to include some constraints without preliminary dialogue.

3.2.4 *Methods of control and sanctions*

In the particular case of agri-environment contracts, the farmers get the transfer payment when he complies with specific constraints. The question of the control of these constraints must be emphasised: should the PNC control the efforts (does it really have the means to do it?) or the results (whereas one cannot quantify biodiversity etc.)? Moreover, monitoring costs are important and as we previously saw, the PNC does not maximize the use of this expenditure but prefers to make sure that farmers will not cheat.

PNC's point of view: the PNC reserves the right to visit the plots to check the application of the contract. On the basis of the report such established by its agents, it can apply sanctions and not pour the subsidy. The DDAF also manages funds and distribute assistances. In terms of inspection, it acts very few on the territory of the PNC and generally, PNC's or DDAF's staff in charge of control act in concert and split the task. Among the signed contracts, in half cases, agents respect the contract, except unexpected difficulties that can give place to endorsements. 45% of contracts are respected but a regular inspection (at least once per week) is considered necessary. The remaining contracts is not yet functioning (but means of pressure exist).

Farmers' point of view: the proximity of the PNC facilitates the creation of trust ties between guards in charge of the inspection and farmers. The guards are perceived favourably because they are part of the Cevennes community and thus have common values, concerns, representations etc. This situation generates "social learning" (they do not have always the same interests but at least the same representations). The farmers did not raise any special problem.

In order to improve the efficiency of the process, sanctions should be implemented in case of non-respects of the contracts terms. Actually, nothing is really done at this time, but the idea of an existing "social control" of free-riders.

3.2.5 Effects on biodiversity

The main assets of the PNC are the following : it can control the land on important sites, make an expertise on its territory for the selection of farmers and retrocession of the management of its land (pluri-annual conventions of pasture and exploitation-patrimonial contracts), has been the support for the putting-up of the files for contracts MAE and has a good capacity of inspection. These assets helped it in the implementation of its own contracts.

But, in the design of agri-environment contracts, the practices the agent had before are not really taken into account. Thus, he can be remunerated for practices he already had and that reduces the effects of the contracts on biodiversity, even if, as shown by Motte et al. (2003), such contracts make it possible to protect the biodiversity in the long run by guaranteeing the maintenance of these practices for at least the term of the contract. Furthermore, the lack of precise data on the initial state imply there does not exist any usable benchmarks of the biodiversity and environmental quality that can be compared with. And the problem is to find the adequate “transition” between the old practices and the new ones.

Moreover, the menu of contracts offered by the PNC is *a priori* too narrow (and contracts are not enough differentiated) and is not build in order to allow agent that wish to act in favour of the biodiversity to sign contracts appropriate for them. It seems that the most difficult point for the PNC is to initiate the first contact with the farmer, who thereafter will sign several contracts and benefit from the opportunities offered to him.

Finally, the identified and analysed move from direct action of the public bodies, towards incentive policies appears unfinished. Despite quite a profound change in the way the park and its now partner institutions design and implement their conservation objectives, there are still several important points that have to be clarified in order to insure that these policies will keep their efficiency and their stability in the future. The main point being the question of assessment: what and how to assess? With which indicators? With what kind of participation of the farmers?

4 Conclusion

The analysis of the numerous actions carried out by the Cevennes National Park towards biodiversity conservation since its creation shows a real evolution that we tried to characterise properly. Through this evolution several constant lines can be seen and the first one, according to the objectives of this paper, is of course that biodiversity protection was since before its creation one the major axes of PNC’s strategies and actions.

On the three decades of the existence of the PNC, the evolution of these strategies and actions can be summarised as a move from direct towards indirect action. Realities and practices are of course a bit more complex, but this move appears as a significant trend and is probably not quite achieved or terminated. The unfinished part of this evolution can mainly be identified in the little concern of the Park and its staff on formal control and sanction of free riding behaviours. It is quite easy to draw some conclusion of this fact. The evolution from command-and-control towards incentive policies and the weakness of sanction procedure may have a common ground: the loss of legitimacy of the State and of centralised policies. In this perspective, the implementation of contracts mechanisms means that, by now on, the state has to pay the citizens in order to have them recognise the interest of its policy¹¹.

Finally, the main meaning of the reported facts and evolution might be to consider their learning aspects. This process can be identified in several dimensions of the biodiversity policy.

The social or socio-economic dimension is essential. After a bit more than three decades of action on a limited territory, the Park’s staff (in which the renewal rate is quite weaker than in most administrative body) developed a very strong relation with its territory and a profound knowledge and understanding of its “anthoposystem”. The setting up of the various forms of incentives can be constructed as an appropriate way to take into account the preferences and differentiated objectives of the local population and its various concerned groups.

The ecological or environmental dimension has already been emphasised. The conservation strategy moved from an approach in which the populations and human activities were tolerated or seen as part of the cultural patrimony on the landscape to preserve. It has long been a joke in the scientific advisory committee of the park to ask genuinely “*why would you prefer to conserve the 1950’s landscape, rather than the 1700’s (‘Camisards War’) or from the Neolithic era?*”. The current answer is to recognise that the existing ecosystem and biological diversity were designed by the secular effects of human activities. Maintaining existing landscapes and biodiversity requires to allow and favour human settlements and type of activities that maintain the same kind of pressure on the environment.

Three decades of learning, of try-and-error process have given to the PNC quite a better understanding of the effects and meanings of its action. The current situation appears nevertheless rather fragile for many reasons. The loss of legitimacy of the public bodies is real and seems to be continuous since the current idea in France is to give to regional authorities the responsibility of environmental policies. Even if this trend is conform with European policy principles, it can be dread that the future strategies will be more oriented towards satisfying local populations wishes and favouring economic development and tourism. On the other hand, the whole PNC’s territory will be included in the Natura 2000 framework. This status might give new financial resources to develop the incentive policy and finally strengthen the local legitimacy of landscape and biodiversity conservation.

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Appendix I

The Cevennes National Park

Located in the south of France, on the southern slope of the old Central Massif, the Cevennes National Park covers a total area of 3 210 km².

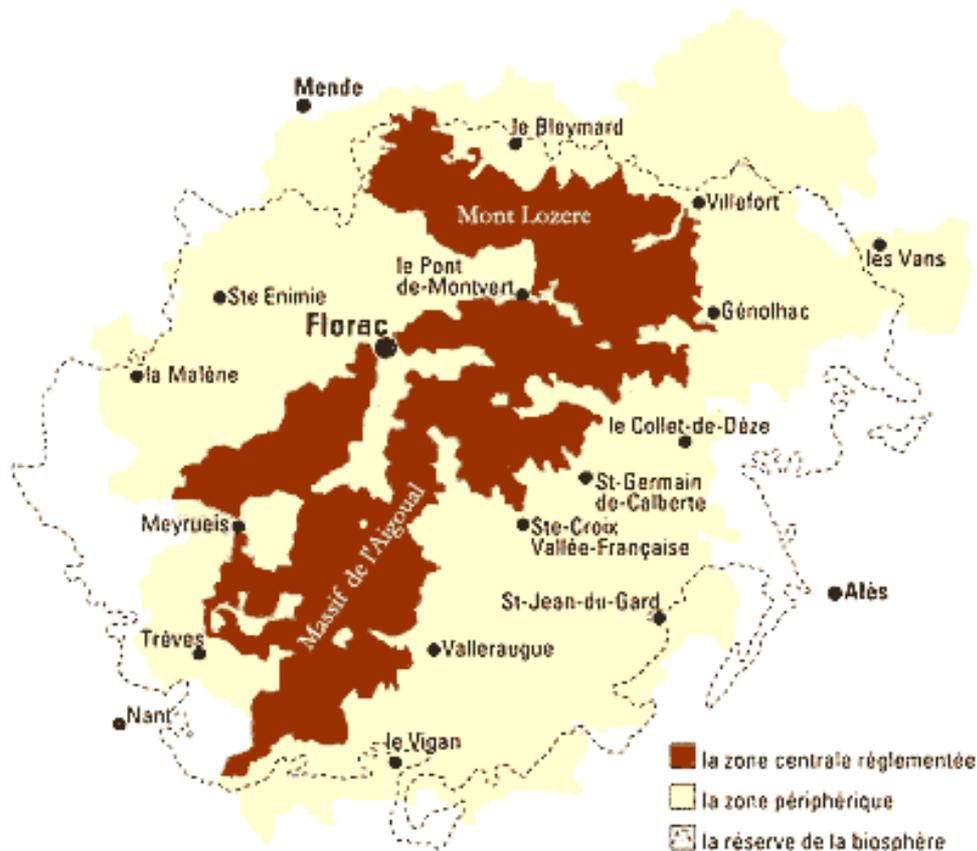


Source: site Internet <http://www.parcsnationaux-fr.com/cevennes/>

- 913 km² in the Core Zone in which 590 people are permanently living (0.6 inhabitant per km²). The Park itself owns only 3% on the land; 7% belong to the communes and sections of communes; 30% belong to the public domain (the State); and 60% to private owners. 63% of the core zone are covered with forests. Meadows, moors and pastures covers the remaining 332 km². One hundred farm are using these open fields.
- 2 297 km² in the so-called Buffer Zone that joins together 65 communes for about 4,000 hamlets and gather 41 000 inhabitants.

The whole park is a Man-and-Biosphere reserve (UNESCO) since 1985. With altitudes from 380 up to 1 700 metres, the Cevennes National Park can be divided in five geographical areas:

- The Méjan limestone plateau with an average altitude of 1 000 meters, mainly devoted to sheep breeding (for milk and meat);
- The Lozère mount, a granite massif culminating at 1 700 metres, dedicated to bovine breeding and ovine transhumance;
- The Bougès mountain, a granite and schist massif culminating at 1 420 metres, dedicated to bovine and ovine breeding and forestry;
- The three Gardons valleys, dug in schist and dedicated to sheep and goat breeding, and to apiculture and chestnut groves;
- The Mount Aigoual and the Lingas, schist and granite massifs, culminating at 1 565 metres, dedicated to pines, firs and epiceas forestry and ovine and bovine transhumance.



Source: site Internet <http://francecevennes.free.fr/PnC.html>

The Park is hosting quite a rich biological diversity (on 0.6% of the national territory):

- More than 2 400 animal species (45% of the vertebrates living in France);
- More than 2 200 vegetal species (including 35 floral protected species and 21 endemic species) 40% of the total French flora.

An interesting point is that a scientific consensus seems to consider that this diversity is strongly related to the presence of human activities that are responsible for the maintenance of open landscape. The current dynamic of agricultural land abandonment and the correlative closing of the landscape is resulting in threats on this diversity, both on animal and vegetal species pledged to these open environments.

On the territory of the Cevennes National Park, the management of the natural environment is then organised following three major axes: the dynamic conservation of the biological diversity and of the landscape; the valorisation of a rich rural heritage; a tentative implementation of a sustainable development.

Aside from the standard board of directors, the Park created several specialised Commissions that gather members of the board and personality of special interest for the theme. The Agricultural Commission is probably the more important one with more than 30 members that follow with a intense interest all the tools and especially the incentive ones that aim at influencing the agricultural practices.

Appendix 2

The Contracts in the Cevennes National Park

I The Mazenot Contracts

The Mazenot contracts are the oldest contracts of services provision financed by the PNC with its own capital stocks; The first have been signed in 1972. They owe their name to their inventor, former under-prefect of Florac.

Objectives: they aim at taking part in the maintenance of a minimum population in the Cevennes, but also at allowing the safeguard of the ways, paths, low walls, irrigation canals, seedbeds, game cultures, natural sites... They are contracts of determined duration that allow the co-management of natural and rural space by farmers in partnership with PNC's actions.

Application: farms located on a commune of the PNC. The contract can be widened with non-agricultural residents.

Effects: they do not have direct effects on biodiversity. Their principal objective is the improvement of farmer's annual average net incomes. But, by supporting and maintaining an activity that used ecosystems and landscapes, especially remarkable ones, they indirectly safeguard vegetal and animal species pledged to these habitats: farmers keep the natural and rural spaces and take part in their restoration, in particular by the reappropriation of old techniques. He can also accompany excursions organized by the PNC.

Quantitative importance: each year, between 40 and 50 Mazenot contracts are signed for a variable individual amount between 2 000 et 3 000 euros (seldom more than 7 700 euros) and a total envelope of 28 965,31 euros. In 2002, 71 contracts were envisaged including 14 with farmers and 1 with a forest group.

Procedure: the PNC carries out an inventory of natural sites and access roads to be maintained on the farm's territory. It works out the specifications that are submitted to the contractor. If this accepts them, the contract specifying engagements and obligations of each part, is signed for five years between the PNC and the farmer. It is not renewed by tacit agreement.

Other characteristics: in spite of the little funding, Mazenot contracts are generally *very appreciated by farmers* (Inspection Générale de l'Agriculture, 1999), because they advance the expenditures and thus facilitate the exploitation's treasury. Thus, they play an important role in the maintenance of rural populations within the PNC. According to the PNC, this type of contract is thus interesting because they make it possible on one hand to consolidate the links between agriculture and environment and, on the other hand, to insert Cevennes' agriculture within the national CTE's framework.

2 The farming contracts

Objectives: farming contracts aim to develop a project of improvement of agronomic and environmental performances of the entire farming system.

Application: farms located in a commune of the PNC and able to fit in a PNC's Authentic. A priority is given to contracts concerning ovine breeding meat for a management of moors and lawns, the promotion of the specific products of the PNC under the name of PNC's Authentic and of organic farming, the support to the transhumance and the maintenance of open lands of the peaks and the agricultural and patrimonial valorisation of hamlets.

Effects: they do not have direct effects on biodiversity. Their principal objective is to support financially farmers in order to help them to maintain their activity. But, indirectly, they allow the maintenance of an agricultural activity likely to maintain and/or improve the quality of open lands, under economically viable conditions. The protection of key ecosystems and landscapes thus leads to safeguard pledged vegetable and animal species.

Quantitative importance: 7 contracts are under development.

Procedure: the PNC carries out with the farmer a diagnosis of the exploitation, its system of production and sale, its territory and inheritance. It works out specifications which are submitted to the farmer. If he accepts them, the contract, specifying engagements and obligations of each part, is signed for five years between the PNC and the farmer. It specifies the engagements and obligations of each party. Endorsements can be carried out by mutual agreement. The contract is not renewed by tacit agreement. Exploitation contracts are centred on the projects of PNC's agricultural orientations documents, validated by the Agricultural Commission and registered in the planning scheme.

Other characteristics: they can be proposed as an additional option to the free choice of farmers who sign a CTE.

3 The environmental schemes

Objectives: from the creation of the PNC to the Eighties, the environment schemes were especially used to supplement farmers' financial support for the construction of agricultural buildings (modernization phase). Since, they enable them to improve their farming system and often to reconvert them by limiting their own investments. They are especially global aids for the farming development, with, sometimes, a collective dimension (for instance for the improvement of the grounds: irrigation, fertilization...) and of the landed control.

Application: farmers who respect the environment in accordance with PNC's objectives.

Effects: they can have very diverse consequences: installations of accesses, creation of water points, reintroduction of the Aubrac race, introduction of Mérens horses...

Quantitative importance: the amount of the subsidy was reached a maximum to 50 000 French Francs (7 622,45 euros) in 1985 (Inspection Générale de l'Agriculture, 1999).

Procedure: the Agricultural Commission of the PNC decides to grant the aid. These environment schemes are similar to the Sustainable Development Schemes (Plans de Développement Durable), that are a French variation of European Agri-Environment Measures and whose implementation is an adaptation to individual situations.

4 The patrimonial contracts

Objectives: patrimonial contracts aim at allowing a conservatory management of remarkable species, natural habitats and landscapes. The most important objects of conservation, i.e. vegetal and animal species, but also ecosystems, with a strong patrimonial value, are part of the Actions schemes (Apollo butterfly, grey partridge, messicoles plants, wetlands of the Mont Lozère and Aigoual, nesting zones of key birds...) which can relate to agriculture but not only.

Application: farms located in a commune of the PNC and whose property contains landscapes, ecosystems and natural habitats likely to enclose a strong fauna and flora diversity. But, as we have just said it, these contracts are not specific to agriculture. These contracts only exist since 2001.

Effects: they are within the scope of PNC's natural inheritance conservation and in particular the maintenance of the quality and quantity of open lands. They make it possible to protect vegetable and animal species threatened, but also key ecosystems and landscapes and then leads to safeguard the vegetable and animal species pledged. One can thus say that these contracts intervene on ecosystems as well as on species. They improved a system of incentive of landowners on the basis of more targeted objectives on biodiversity.

Quantitative importance: they are now around fifty, with up to 3 048,98 euros. From 2 to 4 contracts relating to grey partridge and Apollo have been signed. Currently, there are few debates and negotiations, and thus few contracts.

Procedure: the PNC inventories on its territory the natural landscapes, ecosystems and natural habitats having a strong biodiversity. It works out specifications that are submitted to the farmer who owns this key element of biodiversity. These specifications, as well as the management plan, relate to the object the PNC wishes to protect. The contracts correspond to a standard measure and are used in articulation with CTEs either in space, to take into account a patrimonial target for which no measure can be contracted within CTEs, or to take into account a patrimonial target when the farmer does not wish to commit within CTEs. The contract, specifying the commitment and obligations of each party, is signed for five years between the PNC and the farmer. Endorsements can be carried out by mutual agreement. The contract is not renewed by tacit agreement.

Patrimonial contracts for messicoles species: it is important to exploit the Causse Méjan that shelters 80 messicoles species unique in Europe. The PNC pours 1,524.49 euros per hectare over 5 years. This contract is exclusive to the cereal one (for which the farmer would get 304.90 euros per annum but only during two or three years), but it is advantageous because it generates less expenses (ploughing every two years and less inputs). The PNC must thus convince: by disseminating information and responsabilising farmers, understanding how these constraints are integrated in farmer's strategy, the durability of these contracts and perennality of its action.

5 The LIFE contracts

In the framework of LIFE program, the PNC could decide the use of the funds whose annual amount was approximately equivalent to its total budget (half from the European Union, a quarter from the Ministry of the Environment and a quarter from local resources).

Objectives: the common objective of the party is to try out one (or more) mode(s) of pastoral management of Community interests ecosystems. In particular, it must check the relevance and feasibility of the reintroduction of breeding (in particular of ovine transhumance) on mountain pastures that are rich in biodiversity but threatened by the invasion of undergrowth.

Application: properties of the PNC and those of the ONF. It applies only to agricultural and forested exploitations.

Effects: they leave the assumption that ovine breeding system gives the best results for the safeguard of ecosystems and restoration of natural landscapes quality. However, they were implemented only in 1998 and it is difficult to check the exactitude of this assumption, even if the PNC considers that ovine transhumance on these pasture mountains constitutes an ecological requirement for the management and conservation of open lands.

Quantitative importance: the total amount of the aids is given from the current pastoral management potential of each stockbreeder, namely from the number of animals it has and the duration of pasture balanced by a threshold of good management, while knowing that a contractual compensation is proposed per hectare whatever the type of measure (maintenance or improvement) implemented and the initial state of the vegetation.

Procedure: the implementation of LIFE contracts' management plans by stockbreeders is based on voluntaries.

The inscription of a zone in Natura 2000 network¹² makes it possible to profit from an increase in the percentage of granted subsidies (from 60 to 80 or 100% in the case of tree cuts). After the validation of the plan of each mountain pasture by the steering committee of LIFE program, the contract is established for 6 years between the owner and the PNC. An endorsement is envisaged at the end of the third year and will be established on the basis of first assessment. It will in particular make it possible to add to the contract the necessary recommendations due to the experimental character of the management plans. The payment of the aids is subordinated to the establishment of a verbal lawsuit by a technician of the PNC that confirms that the state of the ecosystem is in conformity with the awaited result.

The owner thus commits himself to respect the pastoral management plan, and on the other hand, the PNC commits himself to provide him *before the beginning of each season of pasture such as defined in the pastoral management plan, a model of pasture calendar. He also commits himself to take care of 80% of works and equipments necessary to the engagement of a sustainable management of the ecosystem [...]* (standard specifications).

Other characteristics: If each contract may contain recommendations more specific to the local stakes, all stockbreeders must take part in the development of the pastoral management plan containing at the same time the objectives to reach, means to implement, recommendations to achieve these goals, durations of rotation, sizes of the pens, an animals rotation plan on the various plots and the burn-beating plan (indeed, the specifications consist both in an engagement of result expressed in the rate of undergrowth and a set of recommendations to reach that point). They must establish the contractualized equipments and respect their use (for example electric fences), eliminate quasi- systematically pines' sowings (these trees are at the origin of ecosystems closure), complete restoration works and establish pastoral equipments envisaged in the management plan within one year and hold a book of annual pasture.

6 The pluriannual convention of pasture

The pluriannual convention of pasture is a contract signed between a farmer and the PNC, leaving it the possibility to include in the specifications of biodiversity protection measures.

Objectives: it aims to make it possible to an owner to entrust the maintenance of its site to a third person without being obliged to resort to a lease subject to the tenant farming statute. But the PNC generally chooses to add a second objective of biodiversity protection by integrating into the specifications some measures encouraging the tenant to protect ecosystems and species.

Application: zones of mountain and pastoral or extensive activities delimited by ministerial decree.

Effects: it makes it possible to emphasize the plots of the exploitation and to fight against the evolution of set-aside lands. This leads to safeguard the vegetable and animal species pledged to open lands. Moreover, some work realized on the exploitation contributes to the improvement and restoration of biodiversity (maintenance of low walls, burn-beating...).

Procedure: in accordance with the article L. 481-1 of the French Rural Code, the PNC rents to the tenant who accepts. Rights and obligations of the two parties are fixed by the convention (with respects to the conditions of civil beams). In particular, the farmer must respect some practices, and the PNC can recommend others. The prefect fixes the duration of the convention and limits of the rent after consulting the Chamber of Agriculture. At the end of the contract, if the tenant remains and the PNC does not intervene, it is renewed by tacit agreement (Article 1738 of the French Civil Code).

Control: the PNC, by a general declaration, must inform the tenant on the methods of valorisation of goods given to convention. The taker will not be able to make, without the explicit and written assent of the PNC, any changes in the rented places, others than those put at his load by the convention.

7 The contracts on ageing forest plots

Contracts on ageing forest plots signed between the ONF and a forester and/or the PNC.

Objectives: they aim at creating forest belts allowing the development and conservation of animal and vegetable species pledged to the final phases of the forest cycle (maturity, senescence, deterioration, death of the trees). These forest belts are of reduced size (1 to 7 hectares). One lets them evolve without intervening.

Application: exploited parts of forests and distributed on the territory in such way that the average distances between the centres of the plots lie between 500 and 1,000 meters, 800 meters being regarded as an optimum distance (they should not be coupled to surfaces not exploited that are in fact big ageing plots). All the main types of station, types of settlement, tree species, must be represented. The ONF privileges, if that are possible, masts sand settlements and settlements from natural origin. Conventions concern forestry but also roadwork.

Effects: they make it possible to develop a natural dynamics of renewal after the operations of improvement that will ensure the stability of the stems constitutive of the plots and to safeguard the animal (insects...) and vegetal species pledged to the final phases of the forest cycle that would have disappeared in an ordinary forest operating system.

Quantitative importance: in the PNC, from 3 to 7 hectares of cumulated surface are concerned by this type of contract, for each approximately 100 hectares exploited plots. Unit surface lies between 1 and 7 hectares. One has at the optimum 2 to 3 plots for 10 hectares.

Procedure: designation is within the ONF's province. It must be carried out in installations of more than 15 years and will progressively be continued through revisions of installation. The PNC, associated to these revisions, will propose the most judicious localizations. The ageing plots will be mentioned on the card of the concerned plot. If the choice of an establishment does not (or no more) seem in conformity with the aims in view, a working group made up of ONF's and PNC's agents will be able to decide the replacement of the plot.

Control: the working group is also in charge of the development of a protocol of monitoring and inspections. In case of pullulating primary pests, threatening to extend to close settlements, the ONF will propose to the PNC the methods it will have to implement.

Footnotes

¹ The National Park of the Vanoise was created on July 6th, 1963, the Port-Cros' on December 14th, 1963, the Occidental Pyrenees' on March 23rd, 1967, the Cevennes' on September 2nd, 1970, the Ecrins' on March 27th, 1973, the Mercantour's on August 18th, 1979, and the Guadeloupe's on February 20th, 1989.

² The installation of tranquillity zones and the provision of mass graves on the entire territory (where the guards of the PNC put down the corpses of dead ovine animals from breeding) played a crucial role, the mass graves being re-enrolled in the old functioning of the agro-pastoral economy.

³ In spite of long lasting preliminary negotiations with hunters associations, this decree was immediately attacked and the Conseil d'Etat broke it in 1973. The modifying decree of creation of the PNC was promulgated only in 1984.

⁴ The damage made by deers in forests are not compensated (thought they are for arable lands) because wild fauna is considered as part of forests natural biodiversity. This generates conflicts between the PNC and forest owners.

⁵ Subjected forests are the forests owned by territorial bodies (communes, departments, regions) and managed by the ONF.

⁶ These improvements did not resolve all contradictions as it can be understood.

⁷ And European if not worldwide.

⁸ Actually, informal agreements or, at least, dialogue, existed between the various institutions since each one is represented in the technical commissions of the Park (for instance the Agricultural Commission or the group dedicated to the implementation of the Natura 2000 area), and the contract appears then mostly complementary to this dialogue.

⁹ For example the PNC created on its territory a game reserve delimited without dialogue by fences that disturbed the stockbreeders who worked on bordering exploitations. After a period, the PNC allowed this reserve to become overgrown, but without eliminating the fences.

¹⁰ Approved by the Ministry of the Environment that is in charge of National PNCs and after the advice of its (specialized) Commissions (in particular the Agricultural).

¹¹ On the other hand, it must be quoted that, according to externality theory, there is nothing irrational in subsidising the agents that carry the costs of these policies.

¹² Note that the Causes Méjan and Aubrac did not accept Natura 2000.