Integration of Nature Protection in Forest Policy in France

INTEGRATE Country Report

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Summary

Since the beginning of the 19th century the forest area in France has expanded to about 15 million hectares, mainly due to land abandonment in mountaineous areas and afforestation on former agricultural land. The average dead wood value is three times higher than 100 years ago. Until the end of the 13th century, French forests had been widely devastated before King Philippe Le Bel subsequently created an administration for water and soil. However, the forests were still overexploited during that time. As a consequence of more and more wood consumption in French forests, Colbert`s ordinance, known as "*l'aménagement forestier*", was stated in 1669 and has determined all the forest management plans that followed. Finally, the French Revolution of 1789 created big changes in French forestry as royal forests became state forests, hunting was abolished and the use of forest products changed to a relatively more liberal exercitation. In 1827, the "*Régime forestier*" was introduced and it was declared that public forest management was entrusted to the administration of Water and Forests. It was implemented that biodiversity should be respected and that timber sales had to be in accordance with a harvest program. Land use changes and the awareness that forests protect the environment in mountainous areas of natural hazards have led to an expansion of forested areas since the 1850´s.

The National Forestry Fund (FFN) was established in 1946 and has directly supported reforestations on abandoned farmland after World War II up until 2000. This had a strong impact on French forestry as the plantations of coniferous trees became dominant. The influence on biodiversity and on the landscape was serious and many specific forest sites with certain species composition disappeared.

The French wood industry is quite an economic factor though the total trade deficit of wooden products has been calculated up to EUR 6 billion for the year 2008. The forestry sector in France is an important employer and has the potential to create even more jobs in the future, since the French government has recently decided to increase timber harvesting and to develop the wood processing industry in relation to ongoing increase of forest area and standing timber volume.

France has been strongly involved in the Helsinki process and developed a ten-year guideline for the French national forest program based on the European program on criteria and indicators for sustainable forest management. The French concepts includes the sustainability of the number of species, the coppice and standard mix, the quantity of dead wood, carbon emission or storage, and other. Non-timber products also play an important role in the French forests and have been recently assessed within the IGN (Institut National de l'Information Géographique et Forestière). Furthermore, in 2011, 2.8 million hectares of forests were considered as Natura 2000 areas. Nature reserves of ecological interest for fauna and flora (ZNIEFF) are areas of great biological and ecological interest and account for a large area of the forest area in France.

Generally spoken, French forest policy follows the approach of harvesting more but protecting better the French forests. The overall aim would be to classify 2 %

of the forest area with a strong protection status. At the same time, added quantities of wooden products should be harvested mainly to serve the rapidly increasing market of the energy timber sector. Within a certain program, the timber-related industry gets subsidies from the state to follow the Regional Long-Term Plans for Forest Development (*Plans Pluriannuels Régionaux de Développement forestiers* or PPRDF) which have been established by the government.

The monitoring of the French forest policy is a very important task, aiming at controlling the efficiency and the outcome of the manifold forest-related institutions. There are various instruments designed to evaluate and monitor national and regional processes, and programs established by the government.

Ultimately, the French forest sector is very active and plays quite an important role for the economy and for the society. Many institutions have been established and lots of support is paid directly or indirectly to the various forest owners in France. Countless studies and actions are conducted to evaluate resources in French forests, but also to plan the supply of various goods or to estimate costs for infrastructure and harvesting. It is also seen one of the state's specific task to influence forest management practices and to force adaptations to new developments. Enforcements to create associations of forest owners are strongly supported by the state and display the high value and standards of the French forestry sector as well as training activities for forest owners.

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List of Abbreviations

FFN	Fond Forestier National / National Forestry Fund
DFCI	Défense des Forests contre l´incendie
CRPFs	Centres Régionaux de la Propriété Forestière / rgional centres of forest property
PSG	Plans simple de Gestion / Simple Managment Plans
ONF	Office National des Forets / National Forestry Office
IGN	Institut National de l´information Geographique et Forestière / National Institute for Geographic and Forestry Information
ECOFOR	Ecosystèmes Forestiers
CNPF	Centre Nationale de la Propriété Forestière / National center of private forest owners
SRGS	Schéma Regional des Gestion Sylvicole / Regional Woodland Management Schemes
CBPS	Code des Bonnes Pratiques Sylvioles / Good forestry practices
RTG	Règlement Types de Gestion / Management Model Regulation
FNCOFOR	Fédération nationale des Communes forestières / National Federation of Forest Owning Communes
CFT	Charte Forestière de Territoire / Forestry Charter
CNIEFEB	La Compagnie Nationale des Ingénieurs et Experts Forestiers et des Experts Bois National Company of Forestry Engineers and Experts
UCFF	L´Union de la Coopération Forestière Francaise /-Union of French Forest Cooperatives
MAAPRAT/MAAF	Ministère de L´Agriculture de L´Agroalimentaire et de la Foret / Ministry of Agriculture Food and Forests
ONCFS	Office National de la Chasse et de la Faune Sauvage / National Office of Wildlife and Hunting
MEDDE	Ministry of Ecology, Energy, Sustainable Development / Ministère du Développement durable
SCAP	La Stratégie nationale de Création d'Aires Protégées terrestres métropolitaines / National Strategy of Protected Areas

ZNIEFF	Zone Naturelle d'Intérêt Ecologique, Faunistique et Floristique / Natural Areas of Ecological Fauna and Flora Interest
SPA	Special Protection Areas
SCI	Sites of Community Importance
APPB	Arrêté Préfectoral de Protection de Biotope / Prefectural Decrees of Biotope Protection
RBI	Réserve Biologique Intégrale / Integral Biological Reserves
RBD	Réserve biologique domaniale / Led Biological Reserve
PEFC	Pan European Forest Certification
FSC	Forest Stewardship Council
PDO	Protected Designation of Origin
ADAME	Agence de l'environnement et de la maitrise de l'énergie
PPRDF	Plans Pluriannuels Régionaux de Développement forestiers
ORF	Orientations Régionales Forestières
CRFPF	Commission Régionale de la Forêt et des Produits Forestiers
SRA	Regional Forest Management Planning Schemes / Schémas Régionaux d'Aménagement
DDT	Direction Départementale des Territoires / Departmental Directorate for Territories
DRA	The Regional Forest Management Planning Directives / Directives Régionales d'Aménagement
IFN	Inventaire Forestier Nationale / National Forest Inventory
ASA / ASL	Free Union Association or Authorized Union Association
TFNB	Taxe Foncière non-Batie / Tax on non-built land
CVO	Contribution Volontaire Obligatoire / Contribution paid by the wood industry
ERDF	European Regional Development Fund
EAFRD	European Agricultural Fund for Rural Development

1. General context

1.1 Status and evolution of French forests until 1946

1800 years of clearing and overexploitation

The development and decline of the French forest are linked to the last glaciations and human activities. Many species are preserved in so-called glacial refugia. The forest declined steadily from the time of Roman Gaul until reaching its low point, 7 to 8 million hectares, at the beginning of the 19th century. The forest has expanded ever since to reach 15 million hectares today and an average volume of wood three times higher per hectare. The forest has grown especially in mountainous areas and on the moors abandoned by agriculture. This increase is also partly explained by artificial reforestation areas.

For a long time the French forest was considered as a "common good" with users entitled to specific customary rights such as the right to hunt, the right to "*affouage*", the right to harvest chestnuts or acorns, etc. There was no forest management plan.

In 1291, King Philippe Le Bel created an Administration for water and forests, but it did not reduce the overexploitation. Wood was used for heating and the foliage as bedding or fodder for animals. From the mid-14th century, the manufacturing of bricks and charcoal, the building of houses and ships and the development of foundries consumed more and more wood. The kings therefore enacted the first ordinances to protect, as much as possible, this resource of great strategic importance.

The first real forestry code was created by Colbert's ordinance of 1669 to streamline forest management in order to halt the loss of forest cover. This code unified the law, regulated practices and defined the rules of forest management. Known as "*l'aménagement forestier*", this code has ever since determined the management plan of the forest. This forest management became a model throughout Europe. The French Revolution of 1789 led to big changes in forestry. The right to hunt was abolished, while forest uses became more liberal, which led to the last historical decrease of the French forest. Royal forests were nationalized and became State forests. What belonged to communities of people became the property of the municipalities and are now called communal forests. The remaining forest is private.

150 years of forest growth

In 1827 new measures were included in the forestry code and successfully stopped the clearing. Public forest management was entrusted to the Administration of Water and Forests, now in the hands of scientists and technicians. **Therefore**, forests belonging to the State and local authorities are now ruled by the "*Régime forestier*" which corresponds to a set of special rules preserving the public forest heritage by requiring the implementation of the "*aménagement forestier*". Timber sales must be in accordance with the wood harvest programme and the flora-fauna balance must be respected.

There is no unique representative for private forests. The beginning of the 20th century saw the establishment of the first agricultural cooperatives operating in the forestry sector, especially in the "Landes", an area located in the south-west of France.

Several parameters then allowed the forest to expand again. For example, the decline of rural populations, the arrival of new materials used as substitutes for wood, vast programmes of reforestation to drain the swamps during the Second Empire (1852-1870) or the *Restauration des Terrains de Montagne* (RTM - restoration of mountain territories) were meant to reduce the risk of avalanches, erosion and landslides.

1.2 Evolution of forests from 1946 to 2000

1.2.1 The Fond Forestier National FFN (National Forestry Fund)

Between 1946 and 2000, the State provided financial assistance to individuals and communities for the reforestation of abandoned farmland through the FFN. This fund was also used to finance forest management actions in order to increase the production of wood for the reconstruction of the country and the paper industry.
The FFN, as part of the forestry policy, had a strong impact on the environment and the French economy. It led to a very quick increase in the forest area, with the planting of more than 2 million hectares, of which 1.5 million hectares were in private forests. It allowed the creation of nurseries and the setting up of forest roads, tracks and partitioning which made logging easier and more efficient. This fund was often used to finance the DFCI systems (*Défense des Forêts Contre l'Incendie*) to protect forests against fire, as well as to create sawmills in rural areas.
The massive plantation of conifers was proclaimed a national priority at the end of World War II. The forest owners began to reforest, with a recurrent preference for species with very quick growth; this has changed the forest landscape of several regions where coniferous trees became dominant to the detriment of deciduous trees. Most of the reforestation consisted of Sitka spruce, Douglas fir and poplar (very productive clone). These species are exotic and/or genetically modified. The moorlands of the "*plateau de 1000 vaches*" turned into high regular forests of Douglas fir, while maritime pines replaced chestnut trees in the "Cevennes" landscape. The "Morvan" has a hardwood/softwood imbalance resulting in soil acidification etc. The owners and forest operators of these areas generally used a planning system in monospecific high and regular forests. The logging was done by clearcutting. The FFN therefore had a clear impact on biodiversity and landscapes. Bocage and low mountain meadow areas were often reforested. Consequently, landscapes closed and many open and semi-open habitats were destroyed.
This fund amounted to 66 to 100 million euros/year. This money came from a tax on loggers and the first stage of wood transformation. In order to reduce the taxes on these professions and to avoid requesting a derogation from the European regulations, the fund was closed in 2000.

1.2.2 Modern organizations for a better forest management

The second half of the 20th century saw the creation of several organizations which resulted in an increase of timber production while improving forest management:
- In 1963, the CRPFs - *Centres Régionaux de la Propriété Forestière* (regional centres of forest property) were created in order to approve the PSGs – *Plans Simples de Gestion* (Simple Management Plans). This forest management document is now mandatory in any private forest exceeding 25 hectares. This public institution has other missions such as land, technical and economic grouping of forest owners.
- in the 1970s, many forestry cooperatives were created. This indicates a mentality change among the forest owners. They showed less individualism. Cooperatives are definitely an important link between forest owners and the wood processing industry. Cooperatives guarantee wood supply to the industry and now develop other skills. They set up environmental quality certifications.
In 1966 the Administration of Water and Forestry became the *Office National des Forêts* – ONF- (National Forestry Office), a public institution with industrial and commercial functions under the Ministry of Agriculture and Fisheries. Now, its tasks are:

- Management of public forests (belonging to the State, local authorities and public institutions)
- Production of wood
- Welcoming visitors
- Protection of forest, natural habitats and territories (dunes, avalanche corridors, erosion-prone land, etc.)
- Forest Police

Many other organizations were created in the second half of the 20th century. Only those who have had a strong impact on forest management are cited.

2. Strengths and weaknesses of the French forest

2.1 The French government wants to mobilize more wood

Since 1970, various reports regularly presented to successive governments (cf. Jouvenel report 1977, Meo-Bétolaud report 1978, Duroure report 1982, Bianco report 1998, Juillot report 2003, Puech report 2009) all propose to increase timber harvesting and develop the wood processing industry. All these reports note the underexploitation of the forests.

In order to respect its commitments to Europe for 2020, France will have to include a figure of 23% renewable energy (10% in 2012) in its energy mix. That represents at least 20 million extra tons of oil equivalent (toe). To reach this goal, the French government is relying on forest biomass. In addition, following the Grenelle Environment Forum in 2007, several policy decisions have been made to develop timber harvesting in France.

The French balance of trade for the timber and forestry sectors is the second largest national trade deficit behind energy. A record amount of EUR -6.3 billion was reached in 2008. One third of the domestic consumption of softwood lumber is imported (3.5 million m^3). Imports have doubled in 15 years.
At the same time, exports of softwood for casing or packaging have tripled from 320,000 m^3 to 1 million m^3. The balance of trade for round wood is in deficit too. However, the balance of trade for hardwood lumber is positive. The government intends to improve the trade balance in the timber industry especially by developing its use for energy and wood building.

The increase in the quality and quantity of the wood harvest resulting from the above mentioned factors could create many jobs. The timber industry_employs 231,000 people working in rural areas and nearly 450,000 in the entire wood processing industry. An increase of an additional 21 million m^3 in the timber harvest could create 40,000 additional jobs. These extra jobs would be all the more valuable as France has been going through an economic crisis since 2008.

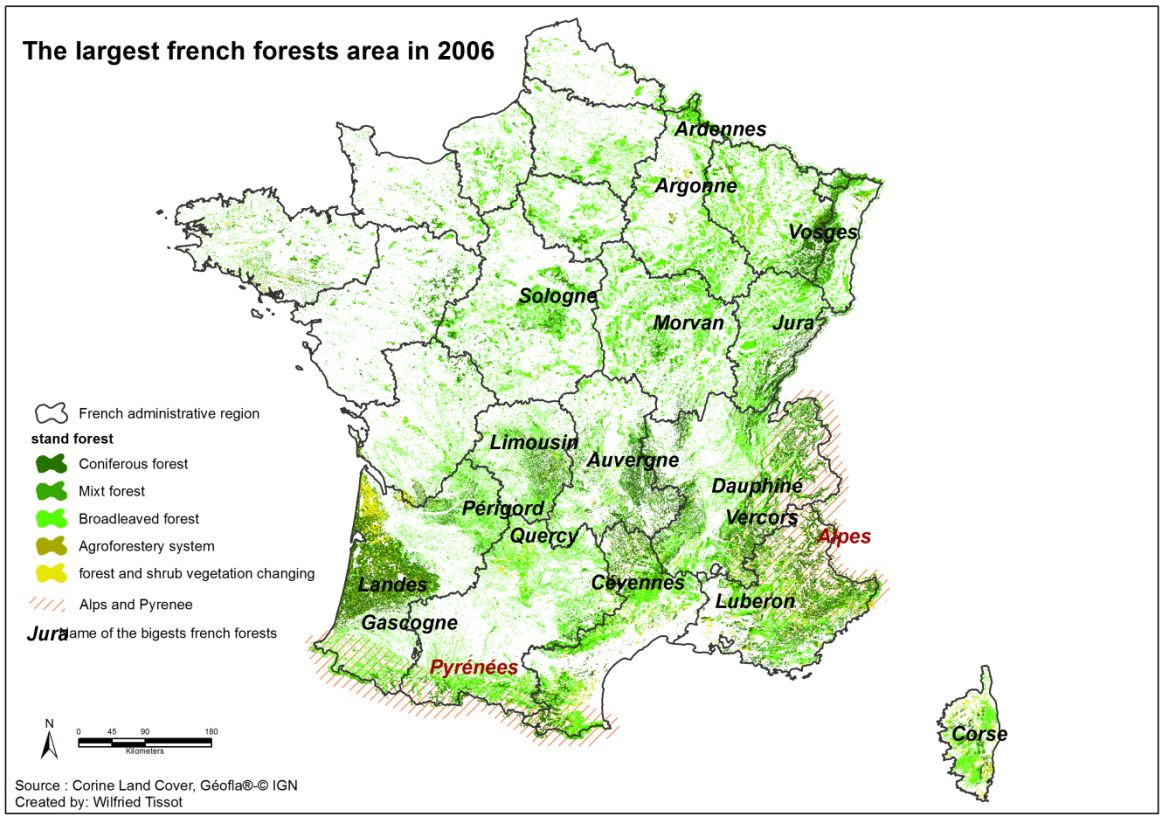

Fig. 1: The largest French forest areas in 2006

2.2 Is the French forest still growing?

French public opinion is not usually favourable to logging. For the population, the forest should remain a place to walk in nature, left in relative wilderness. Little space remains for logging. Elected representatives, under pressure from their constituents and nature conservation associations question the objectives set by these institutions, which they consider excessive. The annual harvest is around 57% of the forest increase, which actually leaves a very important theoretical potential. Reality however is not so simple.

The National Institute for Geographic and Forestry Information (IGN) in charge of the implementation and monitoring of the French forest inventory confirms the potential with nuances.

Analysis of various inventory surveys shows that the forest area has increased from 13.4 million hectares to 15.5 million hectares in 30 years, which corresponds to an average of 75,000 hectares/year or 0.6%/year.

New forests (Fig. 1, 2 and 3) are in very agricultural regions (Normandy, Brittany, Centre, southern Massif Central) and in the high mountains (Alps, Pyrenees). Their origin is either artificial (North-West) or natural through colonization of abandoned agricultural land (Southern Alps, Causses). Forests have vastly expanded in regions near the Mediterranean basin. By contrast, the forest areas in traditionally forested regions have remained stable (North-East, Landes).

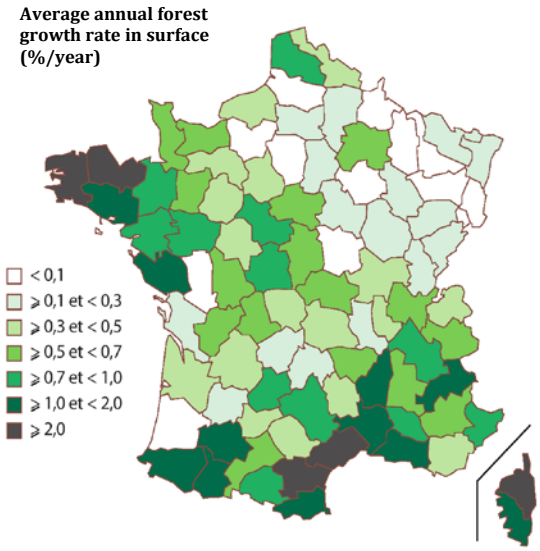

Fig. 2: Increase, changes between 1981 and 2009

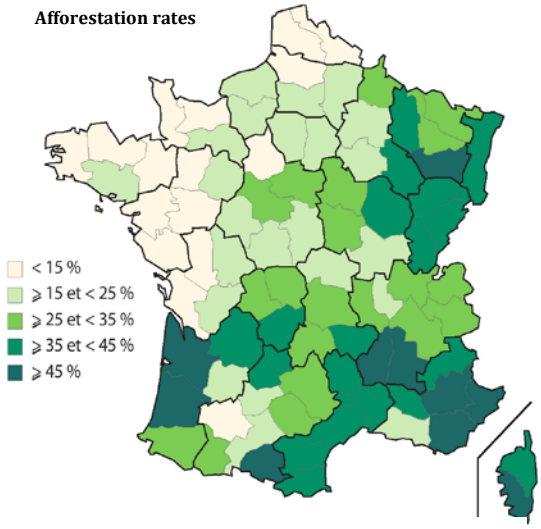

Fig. 3: Afforestation rates in France in 2009

Standing timber volumes in 2009 were estimated at 2.5 billion m^3 consisting of 63% deciduous trees and 37% conifers (Fig. 4 and 5). The increase in volume between 1981 and 2009 corresponded to an increase of 1.4%/year. Apart from Auvergne, Limousin, Burgundy and Centre, which capitalize wood, regions with a low standing timber volume have a strong annual growth. Forests that have recently colonized farmland are young and volumes are still low (Fig. 6 and 7).

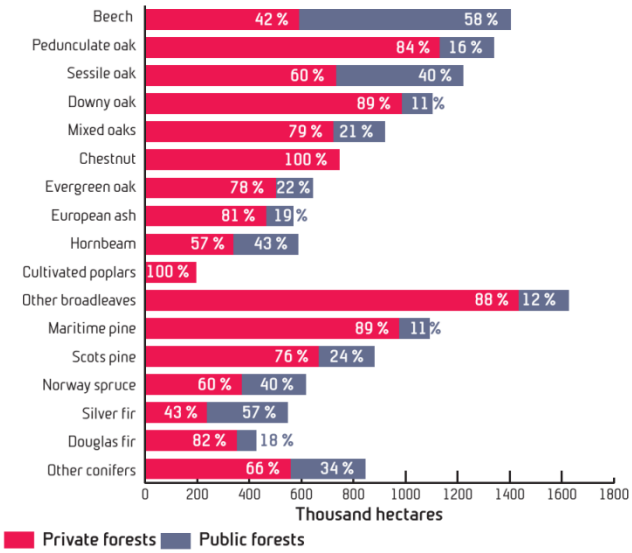

Fig. 4: Areas covered by main species
Source: IGN

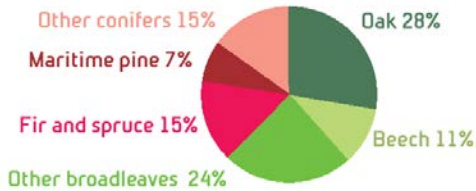

Fig. 5: Total standing timber in French forests
Source: IGN

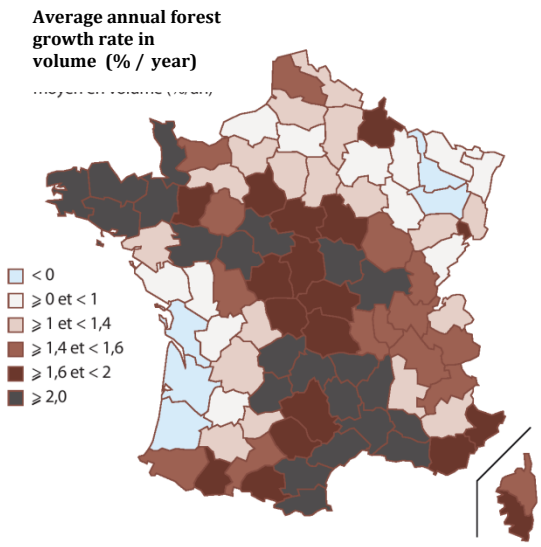

Fig. 6: Evolution of the increase of forest in volume between 1981 and 2009
Source: IGN

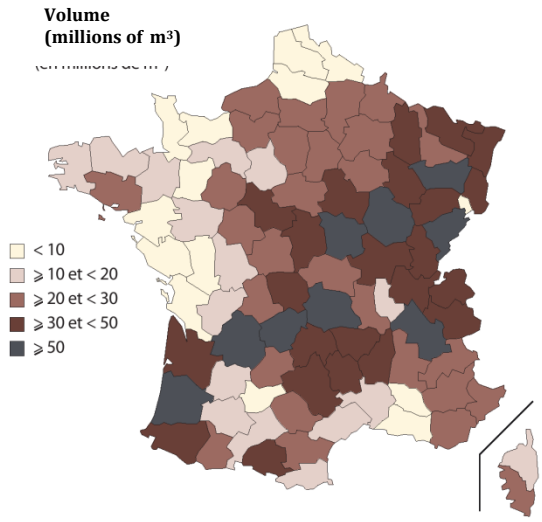

Fig. 7: Volume of standing timber in 2009

2.2.1 Spatial distribution of timber harvest

IGN has measured the frequency of forest cutting in the period 2005-2011 by mesh of 20km² (fig. 8). Six areas stand out:

- The Landes massif and the North-East: These areas are historically forested and the timber industry demand is high. Timber cutting occurs regularly both in private and public forest.
- The North West: weakly forested. These forests are mainly made up of good quality deciduous trees. The frequency of timber cutting is rather high.
- High Mountain and Mediterranean: timber cutting frequency is low and logging is complicated.
- South Central: timber cutting is low and forest capitalization is high.

Various factors explain the low rate of timber harvesting. The steeper the slope, the lower the frequency of timber harvesting. The longer the skidding distance, the lower the frequency of timber cutting. These observations are valid everywhere in France except in the north-eastern mountains (Vosges and Jura) because the density of the forestry road network reduces skidding distances.

IGN has created an exploitability index based on the skidding distance, the type of soil and the slope (Fig. 9). Forest areas where timber cutting is difficult correspond to the sectors with a low frequency of timber cutting, but exploitability cannot be the only explanatory factor.

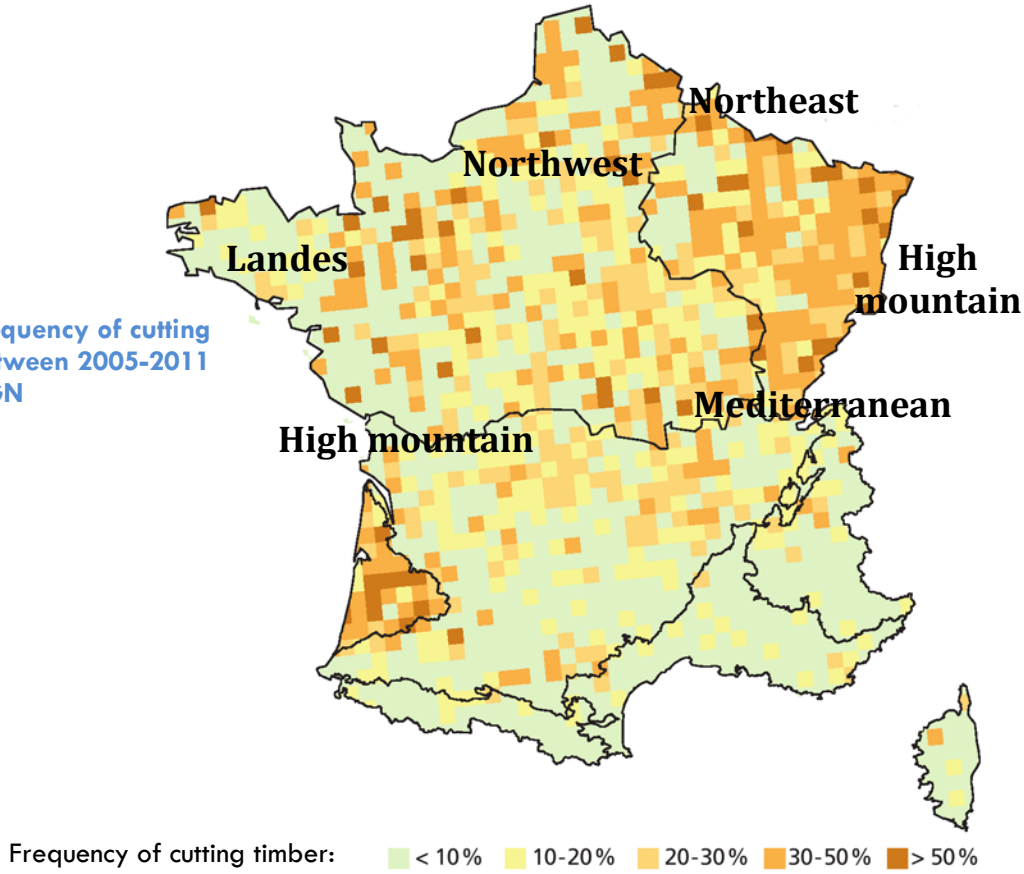

Fig. 8: Frequency of cutting timber between 2005-2011
Source: IGN

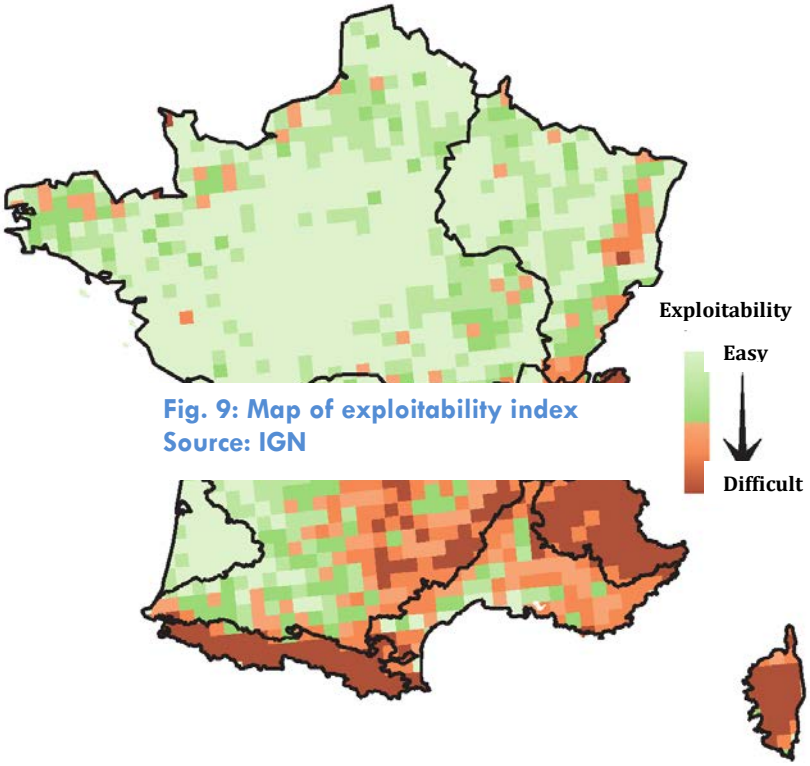

Fig. 9: Map of exploitability index
Source: IGN

Two other criteria are important, one of which is the type of product and diameters and the other is the type of stand - hardwood or softwood.

Type of wood	Frequency of cutting timber
Heavy lumber (diameter > 47.5 cm)	24%
Heavy timber (diameter > 47.5 cm)	16%
Lumber	19%
Neither heavy timber nor lumber	12%
Average in France	20%

Fig. 10: Frequency of cutting timber by type of wood
Source: IGN

Timber cutting frequencies in forests including heavy quality timber are far above the average (Fig. 10). On the contrary, forests without lumber or heavy timber have a low cutting frequency. According to IGN, there was twice as much regeneration felling, thinning or clearcutting in the coniferous stands between 2005 and 2011 as in broadleaved or mixed stands.

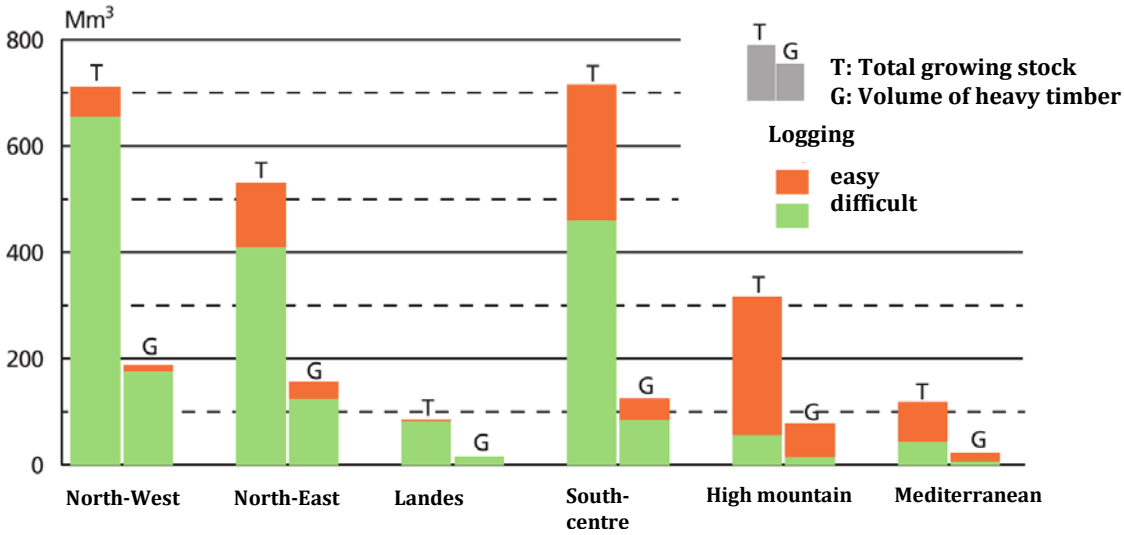

Fig. 11: Heavy timber volume in the six areas according to exploitability
Source: IGN

According to IGN, 1.69 billion m^3 of forests are classified as easily exploitable (69% of the total stand wood in France) but this figure hides the vast diversity found in the various French massifs (Fig. 11).
In conclusion, according to IGN, coniferous trees are more logged than broadleaved trees so that the possibility to increase logging in these wood stands is limited. The softwood reserve is in the Douglas fir planted at the beginning of the FFN activity, which are now reaching maturity and then in the silver fir in southern France, which are largely underexploited. The Corsican pine, Austrian pine and Aleppo pine could also be slightly more exploited. Coniferous logging can be increased under easy exploitability conditions (fig. 12).The maritime pine was severely affected by the 1999 storm in the Landes and cannot bear an increase in cutting. The Scots pine and spruce are already heavily exploited everywhere in France and the beech, highly represented in the northeast, was

severely damaged by the storm of 1999. Beech could only be more exploited in southern France but in this area, exploitability is quite difficult (Fig. 12). The increased potentiality of the wood harvest is twice as high in hardwood as in softwood. The potential of the oak, hornbeam, ash and beech stand is high; however, the additional potential of beech is mainly in the south of France where cutting timber is difficult. The alder, birch, maple and black locust also have a smaller but significant potential (Fig. 12).

Type of tree	Area
Silver fir	South-Centre
Douglas fir	South-Centre and Morvan
Corsican pine / Austrian pine / Aleppo pine	Southern France and South-Centre
Oak	Southern France
Hornbeam / Ash	North-east, North-west, South-Centre
Chestnut	North-west and South-Centre
Sessile oak / Pedunculate oak	Throughout France
Beech	Southern France (difficult exploitation)

Fig. 12: Species by region which could support a larger harvest
Source: IGN

2.2.2 The main hazards which occur in the French forests

2.2.2.1 Pathologies:

Several pathologies or withering conditions affect different species in France. They are caused by micro-organisms such as Phytophthora causing ink disease and chestnut blight (severe disease of chestnut and oak) or insects such as gall wasp (affects chestnut), bark beetles or the pine processionary caterpillar (Thaumetopoea pityocampa). The evolution of the latter is closely supervised in France. It is expanding more and more towards the north of France (fig. 13). A slight increase in phytosanitary problems was noted in the French forest between 1998 and 2010.
The most worrying may be the decline of the ash. It has been attacked by a new species of fungus called Chalara fraxinea, which causes the chalarose disease. 24 French departments in the north-east of France were affected in 2012 (fig. 14). The disease has been spreading rapidly towards the west. The disease is carefully monitored in order to avoid the disappearance of this species. Recall that the elms disappeared from France between 1970 and 1990 because of the Dutch elm disease. Several studies show that not every ash reacts in the same way to this fungus, but the damage caused by this fungus in Denmark leads to pessimism.

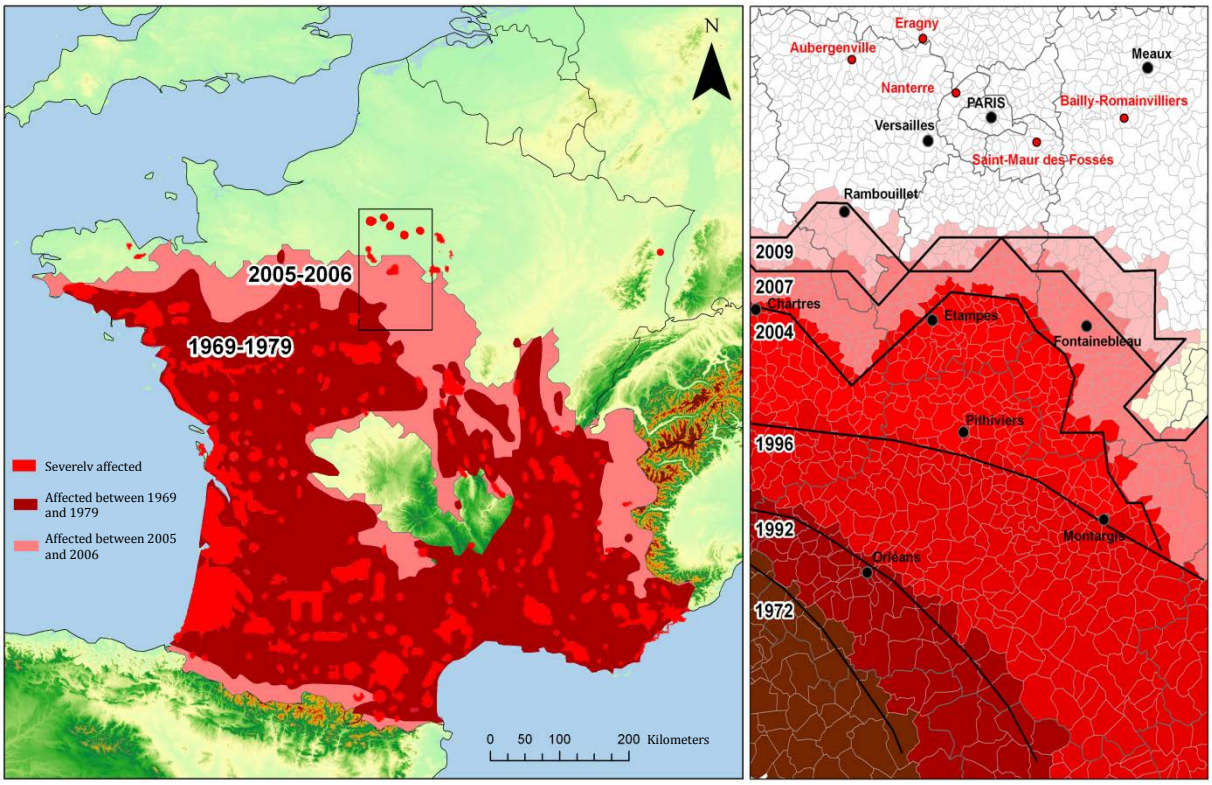

Fig. 13: Areas affected by the pine processionary caterpillar in 2009
Source: INRA Orléans

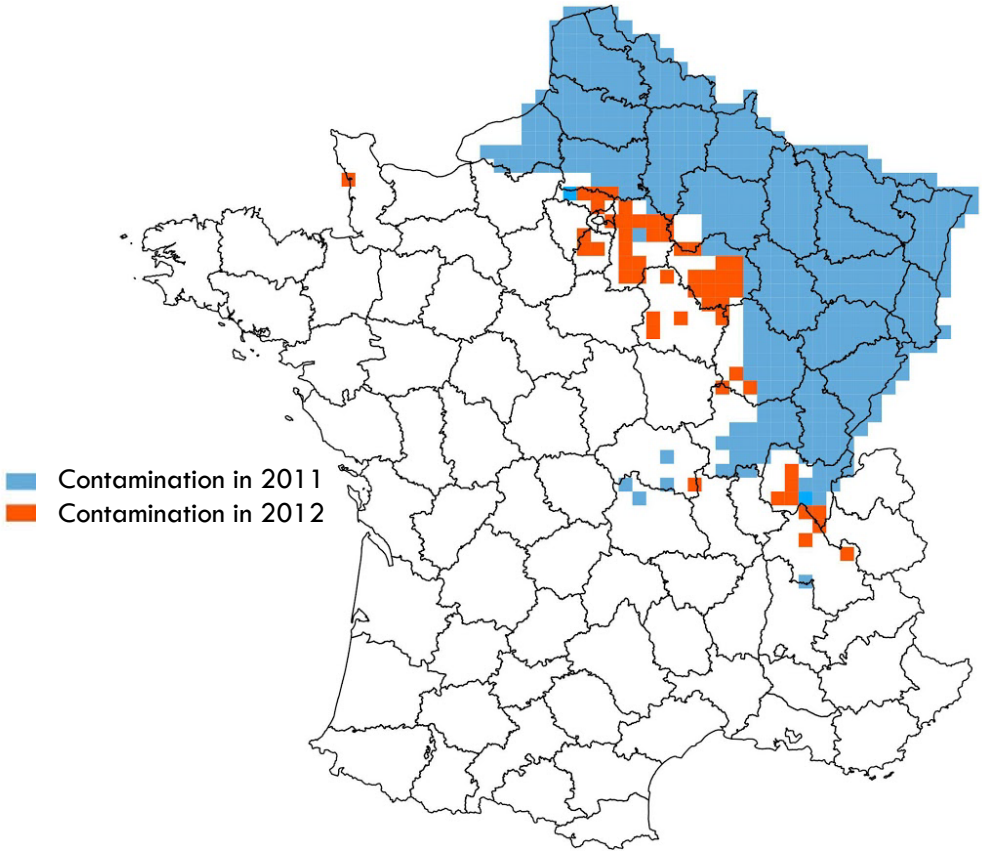

Fig. 14: Areas affected by Chalara fraxinea in 2012
Source: Department of Forest Health, Ministry of Agriculture

2.2.2.2 Forest fires

According to the Prometheus data base, forest fires devastated 866,000 hectares in four regions of southern France between 1973 and 2010. That corresponds to 5,000,000 m^3 wood. Over this period, firefighters saw the start of 99,000 forest fires. The annual figures are very contrasted. Fires have been devastating an average 15,000 hectares/year since 1990, with an exceptional year in 2003 when 61,000 hectares of forest were affected by fire. Before 1990, 30,000 to 35,000 hectares of forest were burnt each year on average (Fig. 15 and 16). The means of defence against forest fires (DFCI - *Défense des Forêts contre l'Incendie*) – tracks, water supply points, ground and aerial means, specific training of firefighters, monitoring systems, communication to the general public, firebreaks, cleared and felled areas etc. have significantly reduced the amount of forest areas affected by fires.

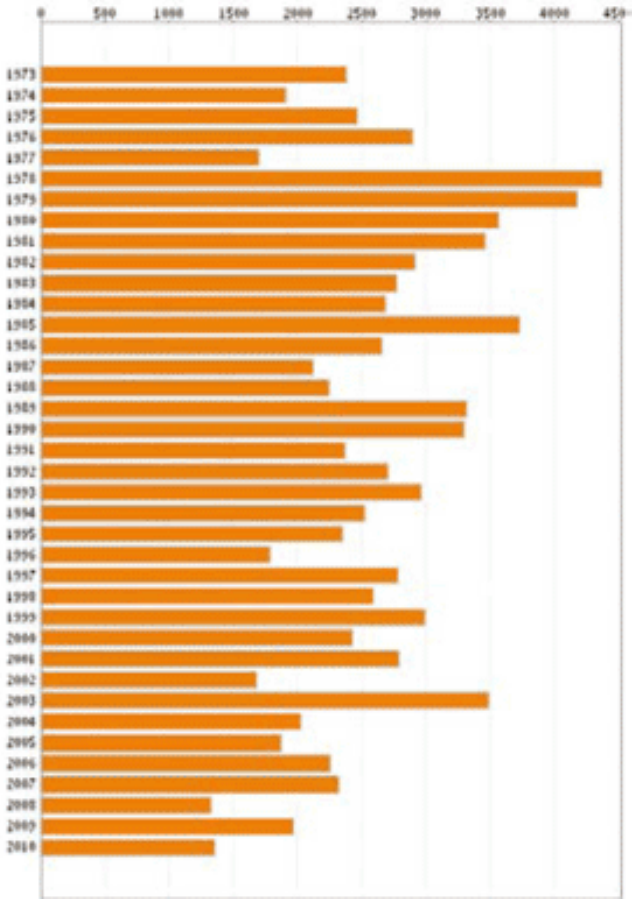

Fig. 16: Areas covered by forest fires since 1973
Source: Prometheus data base

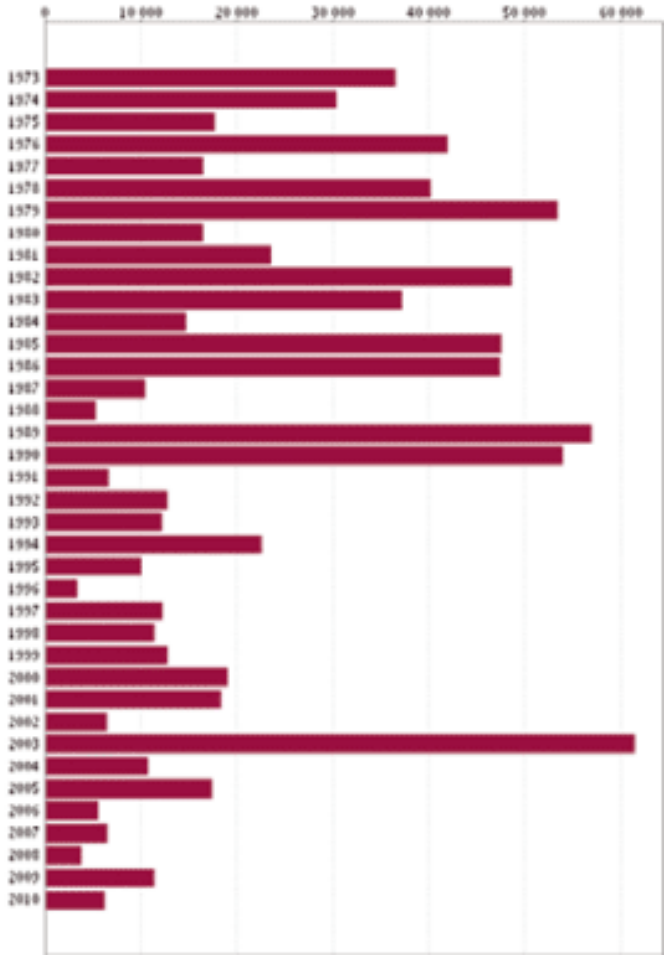

Fig. 15: Number of forest fire outbreaks since 1973
Source: Prometheus data base

2.2.2.3 Storms

French forests have been regularly affected by storms but, in the last twenty years, various storms have had devastating effects. In 1999, the Lothar and Martin storms affected about 1 million hectares in the 45 departments of the northern half of France, about 1 million hectares. According to IGN, they caused at least 97 million m^3 of windthrows. Half of this damage was in Aquitaine and Lorraine. 55% of the damage concerned mainly high conifer forest. Damage was higher than the average annual forest growth. 10 years later, the Klaus storm (2009) and the Xynthia storm (2010) again caused significant damage. 13 departments were affected by the Klaus storm. Aquitaine is again the most affected, followed by the Midi-Pyrenees and Languedoc-Roussillon regions. 150,000 hectares of maritime pine were destroyed, up to more than 60%. According to IGN, the storm caused 40 million m^3 of windthrows.
The vulnerability of French forests to storms is obvious. According to Jean Luc Peyron, director of ECOFOR (*ECOsystèmes FORestiers*), a public interest group for forest ecosystems, the large increase in afforestation of the last hundred and fifty years increases the risk of forests being affected by a storm, whether storms occur more frequently or not. The Academy of Agriculture of France concluded its meeting of 2 December 2009 with the requirement that storm risk be integrated into forest management in the future.

The Aquitaine region is largely covered by agro-forestry and has been the most affected by storms for the last 15 years. It has also been strongly affected by the pine processionary caterpillar and is subject to forest fire risk.

3. Tenure structure and forest management

3.1 The Forest Code and the French forestry regime

3.1.1 The forest code

The history of the Forest Code was presented in the first part of the present report. This part will focus on the contents of the forest code in 2013. The purpose of the forest code is to provide the general orientations of the forest policy and resulting regulations, as well as to present the role of the institutions in charge of its implementation. It consists of 3 books.

The first book is very general. It presents:

- Institutions, their powers and duties, in the forestry sector.
- Forest policies, sustainable management and resulting regulations.
- Defence of forests against fire and related regulations.
- Forest protection and regulations related to this.
- Forest development.
- Penal provisions.

The second book focuses on forests under the "*régime forestier*" (Cf 3.1.2):

- Operations, responsibility and powers of the *Office National des Forêts* or ONF (National Forestry Office).
- Common rights.
- Forest groupings.
- Funding of the activities of forest-owning communes.
- Penal provisions.

The third book focuses on all private forests:

- Institutions and their powers and duties in the forestry sector.
- Forest management.
- Terms of ownership consolidation and their management.

3.1.2 The French forestry regime

All forests belonging to the State, local authorities or public institutions are considered to be of public utility and therefore ruled according to the French forestry regime. As such, these forests are liable to strict management planning. This management has to integrate the multifunctionality of the forest and not just production. The French forestry regime has a direct impact on the current management. For example, accepting visitors is compulsory, as well as taking into account biodiversity and habitats conservation. These forests can also be subject to scientific research. The "*aménagement*" is a management document which is mandatory for each forest and goes far beyond a plain description of the various stands and sylviculture rules to be applied.

The ONF is the only authority in charge of implementing the "*régime forestier*" in partnership with the public owner. 85% of the French forestry regime's financing plan comes from the central government in the form of compensatory payments designed to cover the ONF's management costs. The remaining 15% are financed by the local governments when they pay their forest monitoring cost based on the revenue from the sale of timber.

3.2 Most of the forests are private and highly fragmented

3.2.1 The assets of private forest

Three quarters of the French forest are private (fig. 17 and 18). They include a high diversity of species, consisting mainly of deciduous trees (Fig. 4). Out of the 5 million hectares of oak in France, nearly 4 million hectares are in private forests. Among the most traded species, 80% to 90% of the maritime pine and Douglas fir are from private forests.
Structures also vary a lot. Half of the surface is covered by high forest and the share of coppice (fig. 17), often consisting of small plots devoted to the production of self-consumed firewood, is higher than in the public forest.
70% of the volume of standing timber is located in private forests, although the average standing timber volume is lower in the private forest than in the public forest (153 m^3/ha vs. 183 m^3/ha).

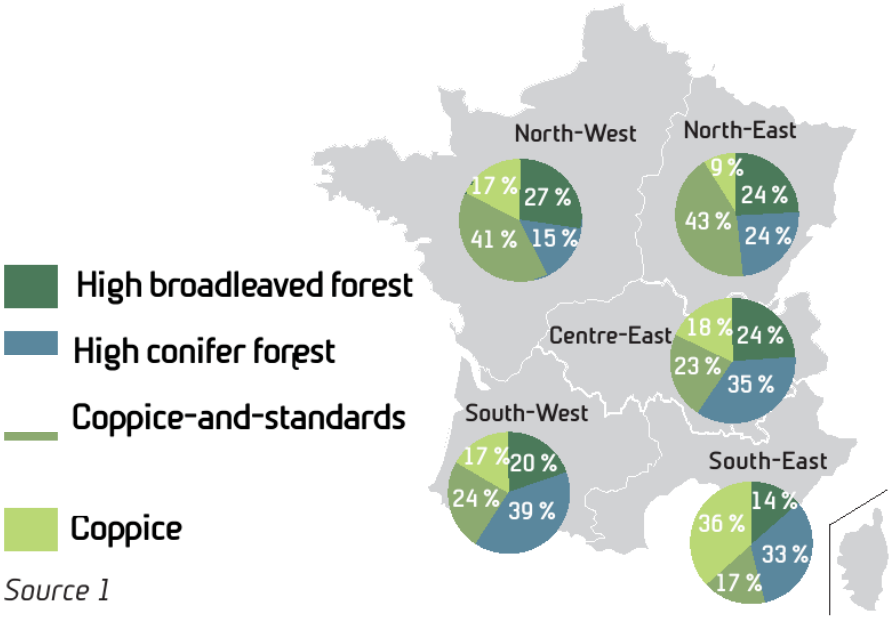

Fig. 17: Structure of private forests by region
Source: IGN

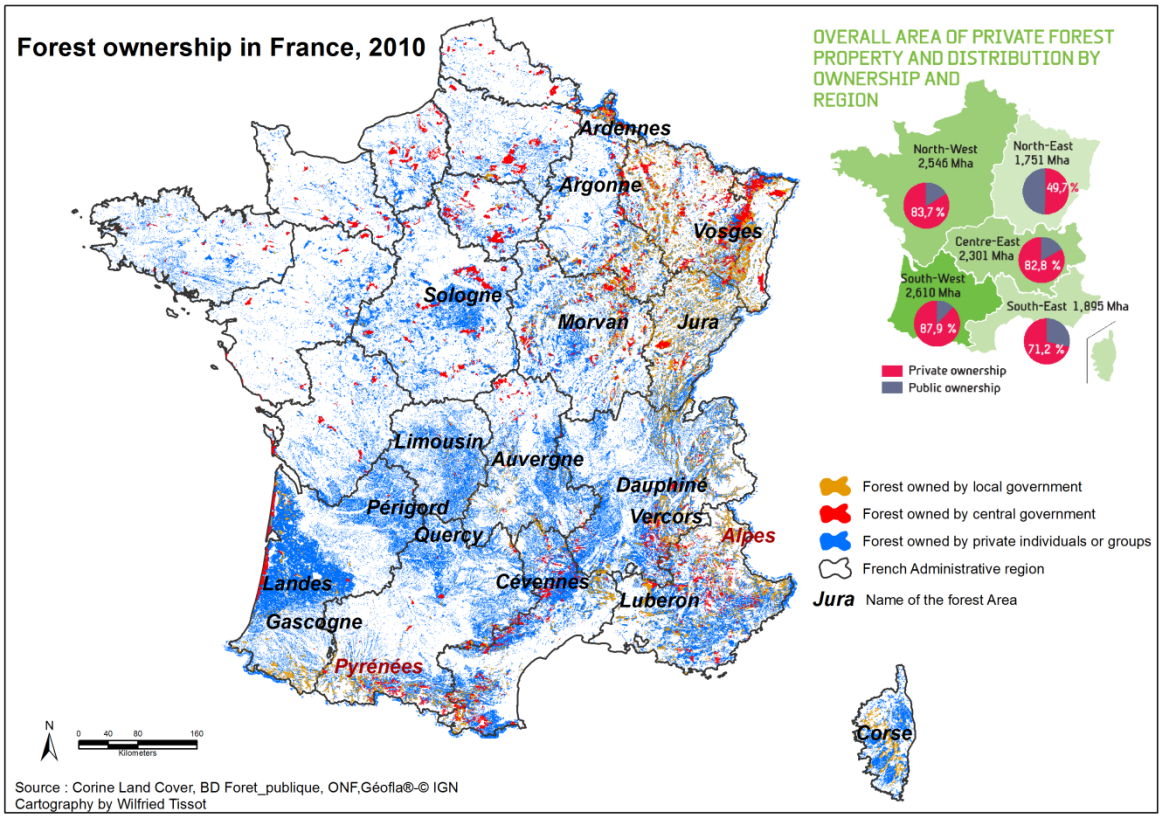

Fig. 18: Forest ownership in France in 2010
Source: IGN, Corine Land Cover, ONF

3.2.2 The weaknesses of the private forest

Part 2 of this report showed that the forest can in theory bear a harvest increase. Increasing the harvest could meet the requirements of the industry while developing wood construction and wood energy in order to achieve France's short- and medium-term goals. The timber volumes are real but they are mostly in private forests. That increases the harvesting difficulties. The 10.6 million hectares of private forests are divided among 3.5 million owners, only 1.1 million of whom have more than one hectare (Fig. 19).

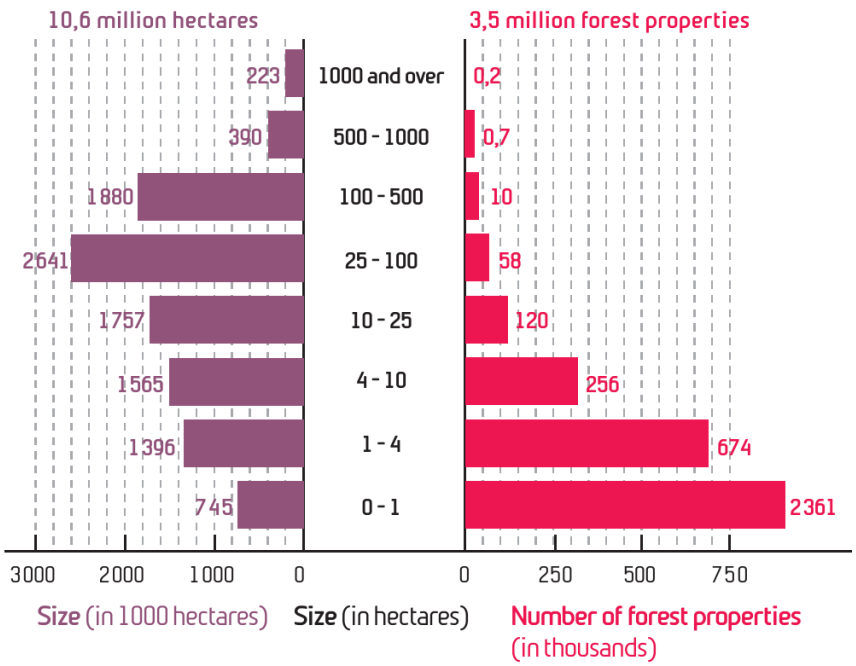

Fig. 19: Privately owned forests by size
Source: Agreste, Ministère de l'Agriculture et de la pêche, 2000

The strong fragmentation of forest ownership severely hampers logging. Logging and skidding costs can only be reduced by working on plots representing relatively large volumes. That requires consolidation or at least right of way. This process is very time-consuming and success is not guaranteed.

The tenure structure is not homogeneous in France (fig. 20); the central, north-eastern and eastern regions are on average mostly divided into smaller plots.

In 2000, according to the CNPF[1], forest owners owned an average 8.8 hectares but not in one piece. They were divided into 5 blocks. Woodlands are therefore highly fragmented, with an average size of 1.8 hectares per management unit.

Despite the efforts of property consolidation via exchange fairs or via the law[2], changes are slow. Forest is a property that is seldom exchanged.

[1] National Centre for Forest Property

[2] The law of modernization of agriculture and fishing of 27 July 2010 guaranteed a preferential right in favour of forest owners neighbouring a wooded plot of less than 4 ha put up for sale.

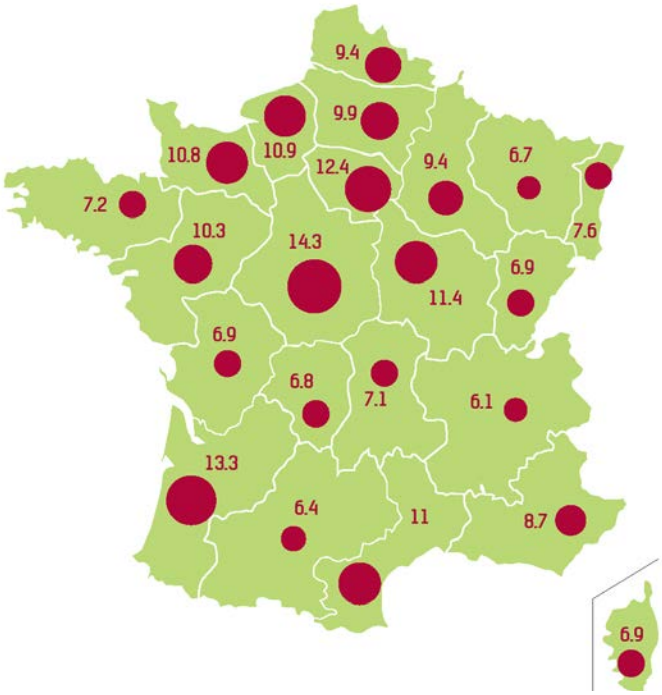

Fig. 20: Average area of privately-owned forests by region (in hectares). Source IGN

Management groupings via legal structures such as free or licenced (ASL or ASA[3]) unions or forest management trade-union associations are growing in numbers but remain marginal.

3.2.3 Private forest management

Since 1963, forest owners of more than 25 hectares have been required by law to create a statutory document called the "*Plan Simple de Gestion*" (PSG), to be validated by the regional centres for forestry property (CRPFs). This document is described in the forestry code and integrated into the sustainable management policy of French forests. The number of PSGs has increased since 2010 because the law no longer limits their relevance to forests exceeding 25 hectares in one piece. PSGs can also be created on a voluntary basis for plots between 10 and 25 hectares or if several owners join their forest plots to create a PSG (collective PSG).

PSGs must be in compliance with the forest code and the Regional Woodland Management Schemes (SRGSs) set up by the CRPFs to define the woodland management practices adapted to each region.

Each PSG describes the stands and the annual programmes of timber cutting or work to be done by plot or subplot. Wild game management is also included in

[3] Free Union Association or Authorized Union Association

the PSG. This document provides an overview of the past management and an analysis of economic, environmental and social challenges.

Owners of small forests can either subscribe to a code of good forestry practices (CBPS) which makes forest management easier and permits them to receive subsidies from the State, or file a management model regulation (RTG). The RTG document describes forestry measures to be applied, advisable rotation and species to be used, and the major environmental issues that should be considered.

In 2010, 2.8 million hectares and 26,500 properties were covered by PSGs. 16,300 owners have subscribed to a CBPS which corresponds to 163,000 hectares. 1147 RTGs covering 18,901 hectares have been approved. If one compares these figures with the 10.6 million hectares of private forest, only one third of the private forest has a management document. This comparison is important because the management document reflects the interest of the forest owners for woodland management.

3.3 The multifunctionality of the public forest

3.3.1 State forest

The State forest represents 1.7 million hectares, 263 million m^3 standing timber and an average volume of 183 m^3/ha (fig. 16). These forests are usually large: 60% of them exceed 2000 ha.

The ONF works on these forests according to strict regulations with the State's guidelines for management to implement multifunctional and sustainable forest management. Management must respond to current needs while preserving the ability of forests to respond to the future needs of society. ONF have established 42 indicators to assess their work.

The ONF must protect the biodiversity and ecological functions of the forest and must also optimize the harvesting of timber while maintaining the standing stock. According to the ONF, 31% of the standing volume is comprised of heavy timber. High forests are the majority (76%) and the distribution between hardwood and softwood is 66% for the former and 34% for the latter. In order to comply with the national forest policy, irregular stands are increasing to the detriment of regular woodland, even while still not the majority. The stands are older than the average French forests. 24% of the forest area is covered with stands aged over 120 years. The five main species are beech (21%), sessile oak (19%), silver fir (9%), pedunculate oak (7%) and Scots pine (7%). Natural regeneration is preferred whenever possible and desirable (species adapted to the soil and climate conditions).

One of the important missions of the ONF is visits by the public. Heavy infrastructure for welcoming the public (information centres, restaurants, accommodation, campsites, zoos, etc.) is relatively rare, consistent with the demand for wilderness and practices more oriented towards hiking activities. Paths are more and more equipped with signposts, resulting in approximately 30,000 km of itineraries dedicated to pedestrians (17,800 km), cyclists (7700 km), horse-riders (3700 km) or cross-country skiers (1100 km). 20% of the forests are close to urban areas and heavily visited by the public. Almost 45% of the

forests represent a strong social issue. Despite this major social component, the ONF does not ignore the others roles of the forest, including protection against erosion and the protection of drinking water resources. State forests are frequently required to install drinking water catchments surrounded by statutory protection areas, which cover more than 43,000 ha of state forests. In addition 205,000 hectares of forest play an important role as protection against natural hazards.

Last but not least of the missions of ONF agents regarding these forests is maintaining a flora/fauna balance that may be threatened by pest problems (see 2.2.2), forest fires (see 2.2.3) or game animals. Despite hunting plans for big game (deer, roe deer, wild boar), which has been steadily increasing for 10 years, there is significant damage to stands. In Alsace, for example, regeneration of the stands is threatened in more than 60% of the State forests.

3.3.2 Forests belonging to local or regional authorities

Communal forests account for 2.6 million hectares, of which 2.11 million ha in forestry. The standing volume is about 468 million m^3 and the average volume is 180 m^3/ha (fig. 16). In general, these forests are large, the average forest area is 186 ha.

The French forestry regime implemented by the ONF ensures the sustainable management of forest resources belonging to local and regional authorities. It is perfectly able to cope with the multiplicity of public owners and the need to combine the long-term rhythm of the forest with the short cycles of elected offices. 14,750 local authorities, including 11,000 communes, own forests. Stand management is the main contribution of forest workers to forest biodiversity protection. It includes actions for the protection of species, habitats and ecological functionalities adapted to local ecological issues. 1,355,000 hectares (47%) are ecologically very sensitive. 54% of those forests shelter special habitats, i.e. slightly more than the national average (44%).
Timber harvesting is as well optimized as in State forests in order keep the stand stock. According to the ONF, those forests consist of 67% hardwood and 33% softwood, 50% of uniform high forest, 24% of uneven-aged high stand, including the selection system and 23% of the standing volume comprised of heavy timber.
The proportion of hardwood (67%) has increased for the last 20 years. The majority of species are beech (19%), sessile oak (14%), English oak (9%), silver fir (9%) and the hornbeam (7%). Natural regeneration is preferred whenever possible and desirable.
Annual timber harvesting is less than the annual forest growth. An increase of timber harvesting to a yearly 200,000 m^3 has been decided through a State-ONF-FNCOFOR[4] contract with a view to stabilizing the wood capital for the period of 2012-2016.
The income derived from timber harvesting is vital for rural communes. Activities around logging generate lots of jobs which are essential to maintain populations in rural areas. Mayors of forest-owning communes have created associations in order to make the best use of this resource and to defend their interests. There were 5,000 municipalities in the National Federation of Forest-Owning Communes (FNCOFOR) in 2013.

[4] National Federation of Forest-Owning Communes

At the gates of cities and in tourist areas, public forests provide open and accessible spaces for leisure activities. Local authorities invest in tourist facilities in the forest in order to guarantee a good living environment for the population. According to the ONF, 33% of forests are very close to tourist areas.
Fully aware of the multifunctionality of the forest, many communes have joined a forestry charter[5] (CFT) (fig. 21), the aim of which is to integrate the forest as the core of territorial policy together with other major issues such as the development of tourism, water management, etc.

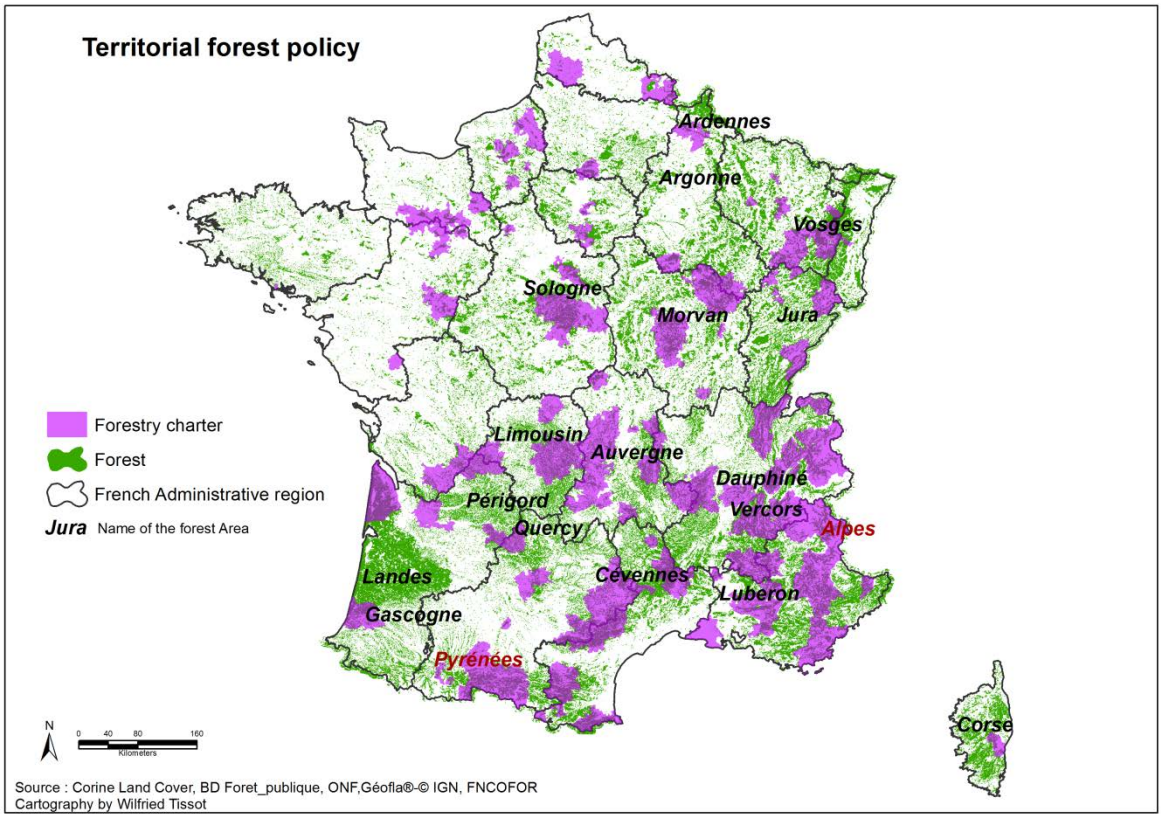

Fig. 21: Forestry Charter Overview in France

Phytosanitary problems have slightly increased in the last years (ONF). Forests owned by local authorities have been very badly affected by recent storms: Klaus and Xynthia destroyed 1.9 million m^3.
These forests form a protection against natural hazards. They concentrate 2-3 times more defensive equipment against forest fires. 17% of forests are intended to protect against the risks of erosion, avalanches, landslides or falling rocks.

3.4 Marketing of timber products

In 2010, 44 million m^3 of timber were harvested in private forests as against 6.2 million m^3 in State forests and 7.8 million m^3 in communal forests (Fig. 22). Timber harvesting is only 66% of the natural forest growth, which is estimated at 103 million m^3/year.

[5] "*Charte Forestière de Territoire*" (CFT)

56% of the timber market from private forests is directly treated by the owners. 26% of the owners used cooperatives and 18% use experts (CNIEFEB[6], UCFF[7]).

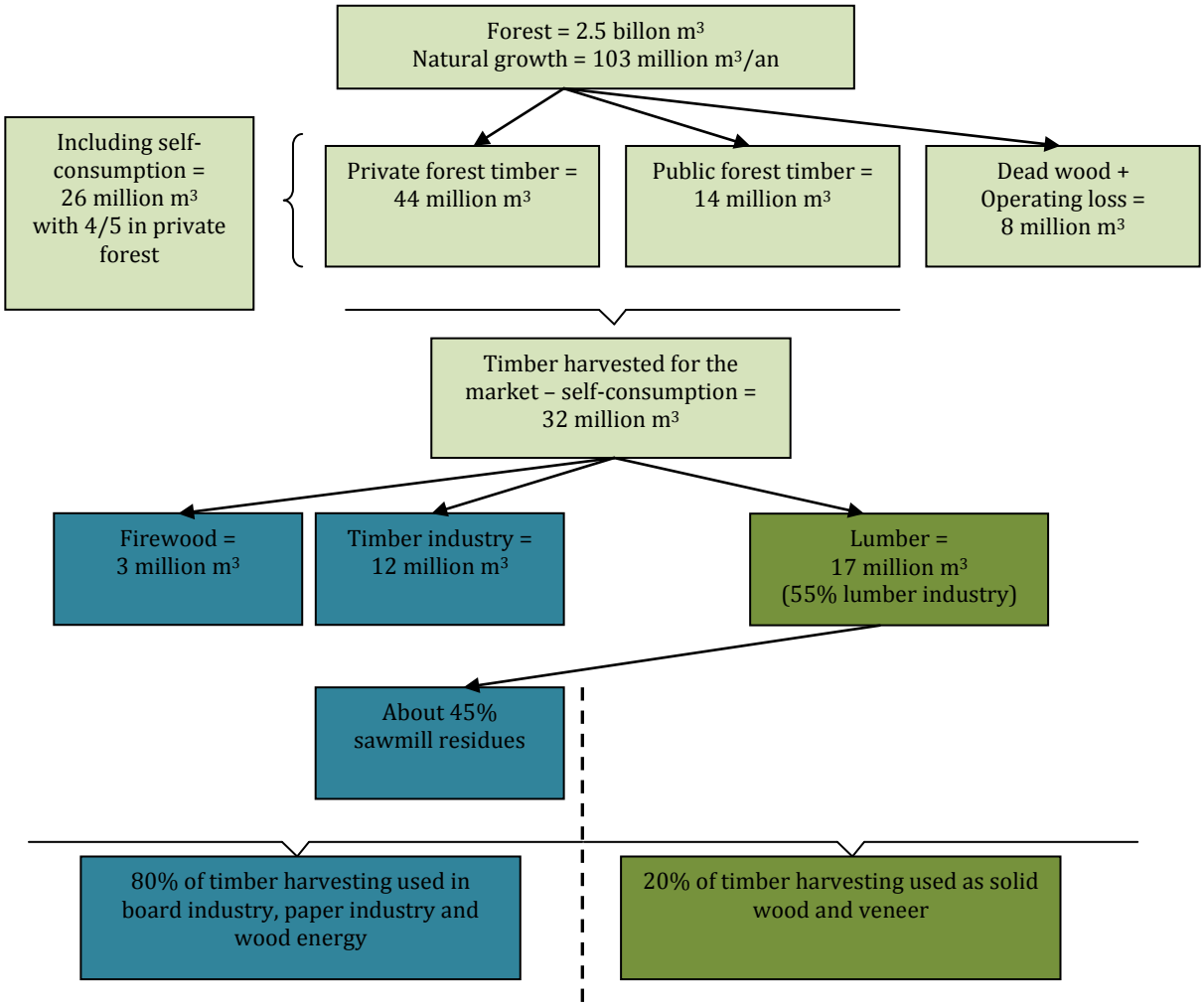

Fig. 22: Types of harvesting in French forests
Source: IGN, Ministry of agriculture, Annual branch survey

The Forest Code describes four methods of sale for public forest timber:

- Sales by public auction, with advertising and competitive bidding procedures.
- Sales by tender.
- Supply contracts ensuring supply for an industrial company.
- Spot sales with mutual agreement allow immediate access to an available product.

Generally, the timber is sold in block and standing, except for supply contracts, where it is selected and stored before selling. In communal forests, 12% of timber volumes are sold by supply contracts and not in the traditional sales by auction. The origin of the timber found on the market is very heterogeneous in terms of

[6] National Company of Forestry Engineers and Experts
[7] Union of French Forest Cooperatives

space (Fig. 23). The northern regions have a long tradition of wood industry and timber markets, which are therefore very developed.

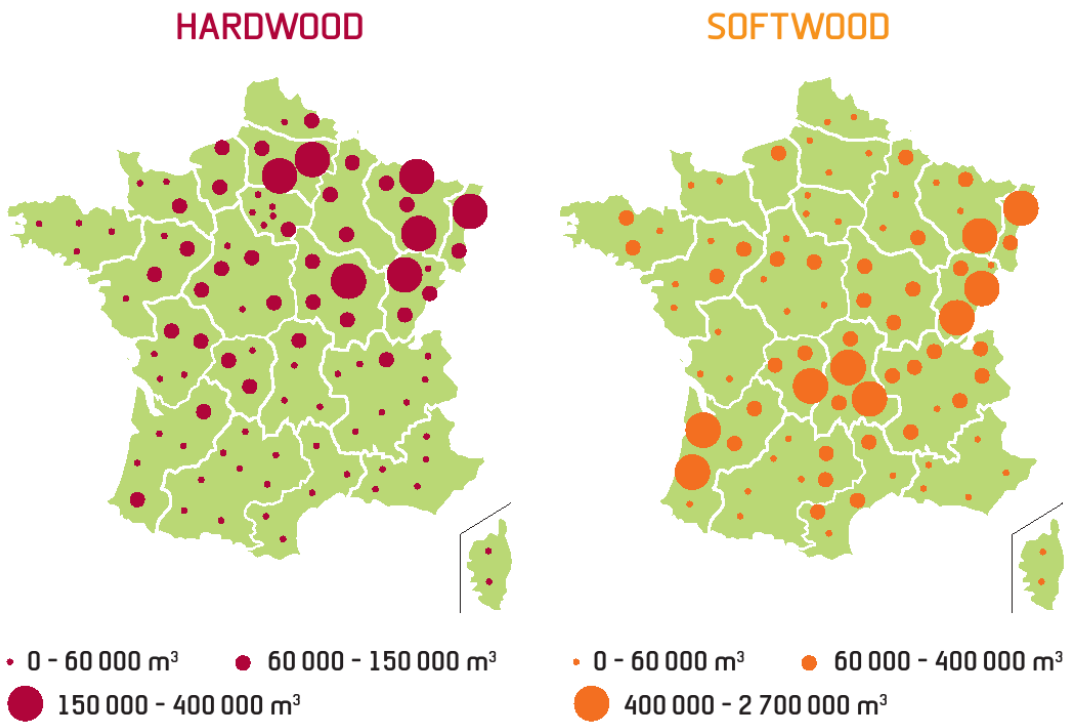

Fig. 23: 2006 timber harvest by region (m³)

The most harvested timber species for lumber are: silver fir and spruce, maritime pine, Douglas fir, oak, poplar, beech and Scots pine, in that order.

4. French forests and sustainable development

4.1 Biodiversity in the forest

France has been involved in the Helsinki process since its inception and plays a leading role in the discussion of indicators for sustainable forest management. The ten-year guideline of the French national forest programme is based on criteria and indicators for sustainable forest management. IGN is the French representative for the implementation of indicators. It uses its own data and the data of almost thirty other organizations such as the statistics service of the Ministry of Agriculture (MAAPRAT), ONF, CNPF, the Forest Economy Laboratory (LEF), the Forest Health Department, Cemagref (research institute) and the National Office of Wildlife and Hunting (ONCFS) .
Carbon emission or storage have become important issues in sustainable development due to the significant media coverage of the climate change phenomenon. The carbon contained in the biomass of trees has now reached 1.14 billion tons in production forests inventoried according to IGN. This represents 80 tonnes of carbon per hectare. The annual carbon sink is about 14 mt for the period of 1996 to 2007. The concept of sustainable forest management goes far beyond the carbon sink concept. It includes the number of species, the coppice and standard mix, the quantity of dead wood, etc.

4.1.1 Forest mixtures, stand structure and age: several indicators of a balanced forest

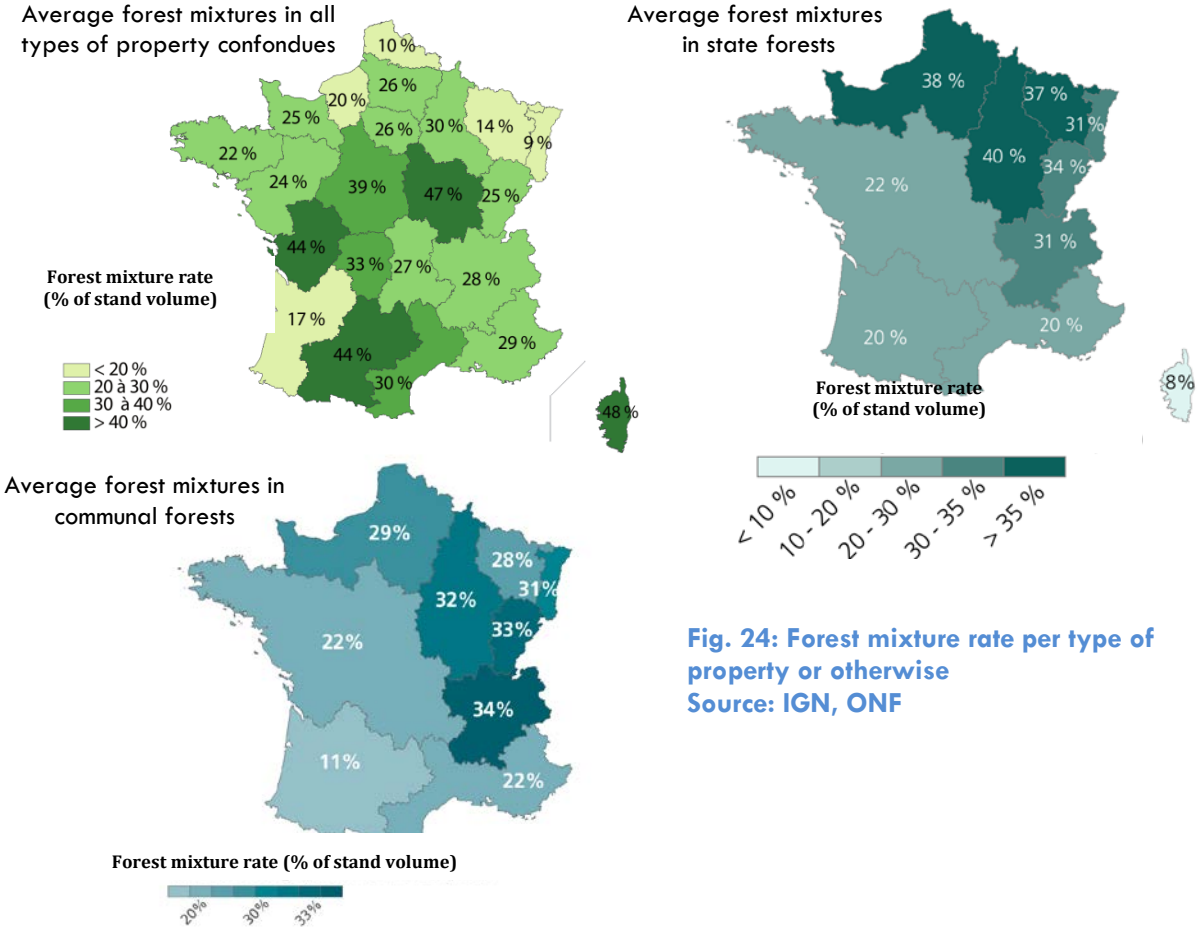

Fig. 24: Forest mixture rate per type of property or otherwise
Source: IGN, ONF

The French forest comprises 137 different tree species, 76 deciduous species and 60 coniferous species. The forest mixture rates are very different depending on the type of property and region (Fig. 25). 92% of the stands in communal forests have at least two species.
Half of the production forest is covered with stands aged at least 60 years. Over a fifth is covered with stands over 100 years old. 52% of the standing volume is composed of medium wood (22.5 cm - 47.5 cm).

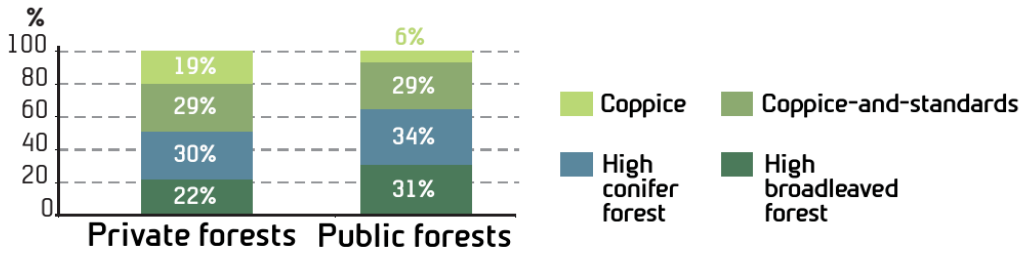

Fig. 25: Structure of private and public forests
Source: IGN

The majority of the high conifer forests are in the southern half of the country, while the North-East has a much lower proportion of coppice than elsewhere (fig. 17 and 24).
This forest diversity has created a diversity of habitats. According to the Ministry of Ecology and Sustainable Development, 72% of French flora species live in forest. 73 species of mammals and 120 species of birds live in these environments. All this diversity can only be developed if the forest storeys and understoreys are present. 10% of state forest area and 4% of communal forest area are dedicated to the conservation of old wood.
The structure of the forest stands and species influence forest biodiversity. The type of logging operation can also significantly impact the ecosystem. The Forest Code regulates the size of clear-cuts. The surface threshold of clear-cutting is defined by prefectural decrees. In France the average surface of clear-cutting is about 4 hectare. The Forest Code also obliges the owner to reforest (naturally or otherwise) beyond a certain surface threshold of clear-cutting.
According to IGN, clear-cutting is practiced mostly in the maritime pine forestry in the southwest, where 1.1% of the forest has been clear-cut every year. The northwest quarter of France is in second position with 0.8% of the forest clear-cut per year. Clear-cutting was also used where the forest industry has been recently developed (Massif Central: 0.6%). Selection systems are more used in areas with a strong forest tradition (East: 0.6% clear-cutting). In the Mediterranean forest, clear-cutting is scarcely implemented (0.3%).
Private managers use clear-cutting as much as ONF, but in private forests, the forests are less reforested after clear-cutting than in public forest. 78% of clear-cutting in private forests are final against 74% in state forest and 70% in other public forests.

4.1.2 Snags, windthrows and logs

Dead wood is an essential element in the balance of forest ecosystems, biodiversity and forest production. ONF estimates that 25% of forest species (fauna and flora) *per se* depend on dead wood. Dead wood is increasingly taken into account in forest management. Since 2008, the forest inventory quantifies the dead wood in forests, including the snags (standing dead wood), windthrows and logs (lying dead wood).

4.1.2.1 Snags and windthrows

According to IGN, snags and windthrows represent 119 million m^3, i.e. the equivalent of almost 5% of the live wood volume. In the French production forests, there is an average of 8 m^3/ha of snags and windthrows compared to 157 m^3/ha of standing live wood.
80% of the snags and windthrows are in private forests; on the other hand these forests comprise 72% of the total live wood of French forests. Half of these are snags from trees that have been dead for over five years (60 million m^3), the other half is divided between snags younger than five years old (40 million m^3) and windthrows (19 million m^3).
Per hectare, these volumes represent on average:

- 2.6 m^3/ha snags younger than 5 years old
- 3.8 m^3/ha snags older than 5 years old
- 1.2 m^3/ha windthrows

The distribution of standing dead wood is geographically uneven. According to IGN, less than half (40%) of the area of production forests contain standing dead wood, that is to say 6.2 million hectares. 25% of dead wood is located in the "Massif Central" and the southwest of France. Concerning the southwest, most of the deadwood is windthrows due to the Klaus storm.
In its study on deadwood, IGN shows that diameters, logging operability, property type and species are factors that influence the quantity of deadwood, while the structure, species diversity and altitude do not seem to be influential parameters.

The ratio of dead wood to live wood, either in volume or in number of trees, is much higher in small diameters, which is certainly due to the natural mortality and non-operating profitability of small diameter trees that are left in the forest.

Where operating conditions are easier, the average standing dead wood is about 7 m^3/ha; when conditions become more difficult the average rises to 10 m^3/ha.

Some species occur more than others in the state of deadwood. Maritime pine and chestnut are the two species with the highest volume of deadwood (18 and 16 million m^3 respectively), but also have the highest ratio of deadwood to live wood (15% for chestnut and 12% for maritime pine). For maritime pine this is due to the storms in the "Landes" region. For the chestnut it is due to aging coppice plots, marked by diseases such as ink disease and chestnut blight, as well as to droughts. The ratio is also above average for the Scots pine, Norway

spruce and deciduous trees, with the exception of the hornbeam, beech, oak and European ash. The ratios of deadwood to live wood are less than 3% for sessile oak, evergreen oak, beech and Douglas fir.

The type of property shows significant differences. On average there are 5 m^3/ha of snags in state forest, 6 m^3/ha in communal forest and 8 m^3/ha in private forests.

4.1.2.2 Logs

Two-thirds of production forest area comprise logs (10.6 Million ha). Log wood in the French forest totals up to 258 million m^3. Its spatial distribution is not homogeneous. According to IGN, "Massif central" forests contain almost a quarter of the logs of all French forests (61 million m^3). The average volume of logs in French forests is 17 m^3/ ha. This average varies greatly from one region to another. For the Mediterranean areas the average is 7 m^3/ha, with 31 m^3/ha for the Vosges region (Fig. 26). According to IGN, in the Vosges, the high volume of logs is explained by the Lothar storm in 1999 and by the very high volume of live wood.

On average, there are 17 m^3/ha of logs in state forest and 19 m^3/ha in communal forests. According to IGN, 61% of the volume of the logs is hardwood (157 million m^3). This is a higher percentage than that of the snags and windthrows (54%). The percentage approximates to the volume proportion of live hardwood (64%). Chestnut represents 10% of logs (25 million m^3). It is followed by Scots pine (23 million m^3), maritime pine (22 Million m^3) beech and silver fir. The distribution of logwood per species differs from the distribution of snags. This can be explained by the climatic events of the last decades which have concerned specific species. According to IGN, the public-private distribution concerning logs is similar to that of live wood.
IGN has created five classes (from nil to very strong) of decomposition of dead wood on the ground. Half of the volume of logs is in a state of strong or very strong decomposition (no bark and medium, high or full decay). Dead wood diameters are mostly small. More than 70% of the volume of logs represents diameters below 22.5 cm.

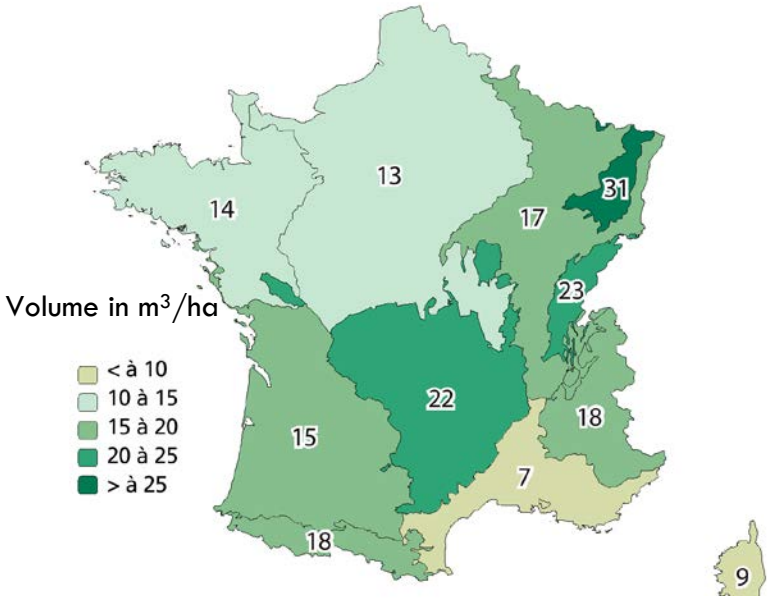

Fig. 26: Volume/hectare of logs in production forest
Source: IGN

Deadwood in forests is an essential component of properly functioning forest ecosystems. One third of forest species (including wood-boring insects) depend on older staged forests and deadwood (MEDDE[8]). The assessment of the MEDDE is a first step towards a better monitoring of the impact of logging on micro-habitats, but other information will soon complement the indicators established by IGN, including specific observation of dead tree cavities. Foresters will probably have to implement a deadwood management plan in the medium term.

4.1.3 Non-timber products from French forests

The revenue from French forest is not solely from the sale of wood timber. In 2009, according to IGN, € 260 million in value came from hunting, mushrooms, cork production, honey production, herb gathering or forest seeds production (Fig. .27). The quantity and value of non-timber products in French forest are part of the indicators of sustainable forest management. More than half of these revenues come from hunting.

Fig. 27: Tonnage and value of non-timber production in French forests
Source: IGN

Non-timber products	Tons/year in 2009	Value in € million in 2009
Venison	25,752	203.2
Mushrooms (incl. truffles)	9	16
Cork	1500	0.5
Honey	5500 to 6900	25 to 34
Herb gathering	4300 to 5000	5.8 to 6.1
Forestry seeds	98	1.3

[8] Ministry of Ecology, Energy, Sustainable Development

4.2 Regulatory or contractual protection and eco-certification

4.2.1 Regulatory or contractual protection

Thanks to the Forestry Code, the forest in France is increasingly managed. Special natural environments and forests with a fauna or flora interest are often subject to special regulations. In the medium term, protected areas will reach 2% according to the National Strategy for the Creation of Protected Areas (SCAP). In state forest, the protection area ratio is much higher (7%), while in communal forest it is 3%. Despite these efforts, further improvements should be made. 29 forest habitats are recognized as of Community interest (Natura 2000), but only three are considered in good condition.

Since 1982, the Natural History Museum under the direction of MEDDE has identified certain Natural Areas of Ecological Fauna and Flora Interest (ZNIEFF). It aims to identify and describe areas with high biological capabilities and a good state of preservation. Two types of ZNIEFF are distinguished:

- ZNIEFF type 1: areas of great biological and ecological interest.
- ZNIEFF type 2: large natural areas rich and weakly modified, providing significant biological potential.

This inventory has become a major component of nature conservation policy. It must be consulted in the context of project planning (town planning documents, creation of protected areas or creation of career departmental schemes, etc.)

14% of the forests are classified in ZNIEFF 1 and 38% in ZNIEFF 2. Public forests are better represented (37% in ZNIEFF 1). This is mainly due to the state forest which is two times more concerned by the ZNIEFF.
Forest areas classified by the Natura 2000 Special Protection Areas (SPA) or as Sites of Community Importance (SCI) are also a good indicator of forest areas of interest regarding bird life or preserved environments.

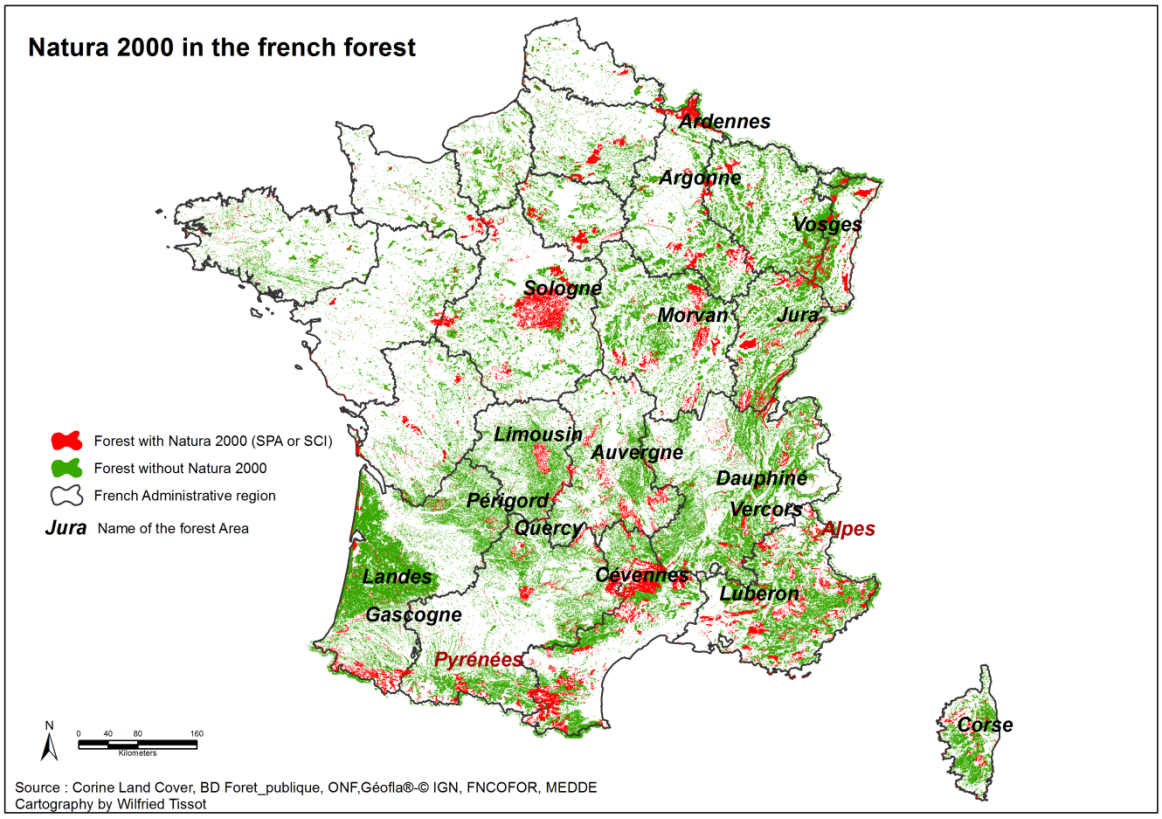

Fig. 28: Natura 2000 in the French forest
In 2011, 2.8 million hectares of forest were covered by Natura 2000 according to MEDDE (fig. 28). 26% of these areas are in communal forests and 38% in state forests. 18% of the French forest is covered by either a SPA or a SCI or both.

Forests covered by either ZNIEFF or Natura 2000 are not subject to binding rules concerning forestry, unless owners sign a contract with the state (Natura 2000). Owners who sign a contract are eligible for exemption from the municipal portion of the tax on non-constructed land. Regional schemes of forest development (cf. 5) have taken into account ZNIEFF and Natura 2000 areas.

However other regulatory areas are binding. Prefectural Decrees of Biotope Protection (APPB), "*sites inscrits*", "*sites classés*", National Nature Reserves and Regional Nature Reserves are very restrictive. Timber cutting is only possible with special permission. These types of protection cover relatively small areas.

National Parks are also very restrictive and are in general much larger than those previously mentioned. Logging is possible but only with special permits and subject to regulation.

Game and wild fauna reserves allow logging but under supervision.

Integral Biological Reserves (RBI) are areas with very high protection where logging is strictly forbidden. ONF manages these areas. There were 39 RBI (ONF) in 2010, representing 80,000 hectares. Managers give free rein to natural ecosystem dynamics. These areas are now considered as "laboratories of nature." Finally, the Led Biological Reserve (RBD) comprised 154 RBD (9,000 hectares) in

2010, according to ONF. In RBDs, it is possible to manage the forest, for example to favour one species or to carry out research and experiments.

4.2.2 Eco-certification

Several processes have been created to ensure the wood consumer with good forest management when he buys wood. There are two certification systems in France, PEFC and FSC.

PEFC (Pan European Forest Certification), created in 1999, is the less restrictive certification. It covered 6 million hectares of forest in 2010, including all state forests. 78% of the public forest and 14% of private forests are PEFC certified. 45,000 forest owners and 2,500 companies are PEFC members.

FSC (Forest Stewardship Council), created in 1993, covers 20,000 hectares of certified forests.

Other certifications have been created to guarantee both good forest management and also the origin of the goods. For example, the wood from "Chartreuse" PDO[9], wood from "Jura" PDO or the "Alpine wood label".

[9] Protected Designation of Origin

5. Funding modes and main orientations of French forest policy

5.1 The main orientations of French forest policy

The current motto of French forest policy is to "harvest more while better protecting the French forest". This motto is a good summary of the objectives of this policy. The policy is oriented towards forest management that more and more considers the environmental aspects. In this perspective the medium term aim of the state is to classify 2% of forest surfaces with strong protection status. In parallel, the objective of harvesting several hundred thousand additional m^3 of wood per year is clearly stated. These additional harvesting volumes should be building timber to support the energy timber sector in order to valorize the by-products of such wood.

Building timber and energy timber are two main axes of development. The creation of short sales channels is also strongly supported.

Woodchip power stations offering a minimum heating power can be co-financed by public subsidies. The ADEME[10] and the MAAF have co-financed the "1000 woodchip power stations" programme for rural areas with the objective of supporting the creation of timber wood chip stations and guaranteeing the supply of local woodchips.

Sawmills can also obtain subsidies for certain types of tasks. The state co-finances the "1000 constructions in local timber" programme.

The government has established the Regional Long-Term Plans for Forest Development (*Plans Pluriannuels Régionaux de Développement forestiers* or PPRDF) in order to identify the areas in which public money will be primarily invested to develop activities and enable the harvest of larger timber volumes.

The state participates to the funding of numerous other activities with the aim of mobilizing the entire timber-related sector.

Nevertheless several points are still to be defined. The actors directly involved in harvesting demand forest that is specially adapted to their needs, which means a forest able to provide a lot of fir, spruce, pine and Douglas fir. But the renewal of plantations would further increase the surface of coniferous trees (see 1.2.1), which is not compatible with the aim of further considering the environmental aspects. The government has not clarified this aspect so far, but it will certainly have to be addressed by the new orientation law foreseen for the end of 2013.

The decision for possible co-funding of large projects for combined heat and power plants supplied essentially by forest biomass is also pending.

[10] *Agence de l'environnement et de la maitrise de l'énergie*

5.2 The evaluation of Forest Policy

The regional strategic documents of sustainable forest management are all approved by the state (fig. 29), for public forests as well as for private forests. The regional forest orientations (*Orientations Régionales Forestières* or ORF) are documents produced by the Regional Commission of Forest and Forest Products (*Commission Régionale de la Forêt et des Produits Forestiers* or CRFPF). The composition of these regional commissions reflects the diversity of the actors involved in forestry at regional level. The ORF are strategic documents orienting the regional forest policy according to the regulations of the forest code.
The regional schemes of forest management (*Schémas Régionaux de Gestion Sylvicoles* or SRGS) are documents that detail the conditions for a sustainable forest management in private forests for each French region. These documents are elaborated by the CRPF and approved by the MAAF. The document is approved by ministerial decree. The PSG, RTG and CBPS have to be in conformity with the SRGS. If the harvest methods used strongly contradict the directives of this management document, the DDT[11] can request payment of a penalty fixed by the forest law.
The Regional Forest Management Planning Schemes (*Schémas Régionaux d'Aménagement* or SRA) are documents defining the conditions of a sustainable management in each French region for forests that are under the forest regime of non-state forests. These documents are drafted by the ONF with the contribution of the CRFPF and the prefect of the region. The document is approved by ministerial decree. The forest management must conform with the SRA. The Forest Management Planning is approved by a decree of the regional prefect.
The Regional Forest Management Planning Directives (*Directives Régionales d'Aménagement* or DRA) are documents that for each region detail the conditions of a sustainable management for the state forests. These documents are realised by the ONF. The document is approved by ministerial decree. The forest management has to conform to the DRA. The forest management planning is also approved by ministerial decree.
The national policy and the regional policies derived from it are based on the work done by CNPF, ONF and the DDT but most of the indicators are provided by IGN. The National Geographic and Forest Institute (*Institut Géographique et Forestier National*) is a public institution created in 2012 by the merger of two public institutions, the National Geographic Institute and the National Forest Inventory (*Inventaire Forestier Nationale* or IFN). The IFN had since 1956 had the mission of providing the inventory of the French forests.

[11] Departmental Directorate for Territories (*Direction Départementale des Territoires*)

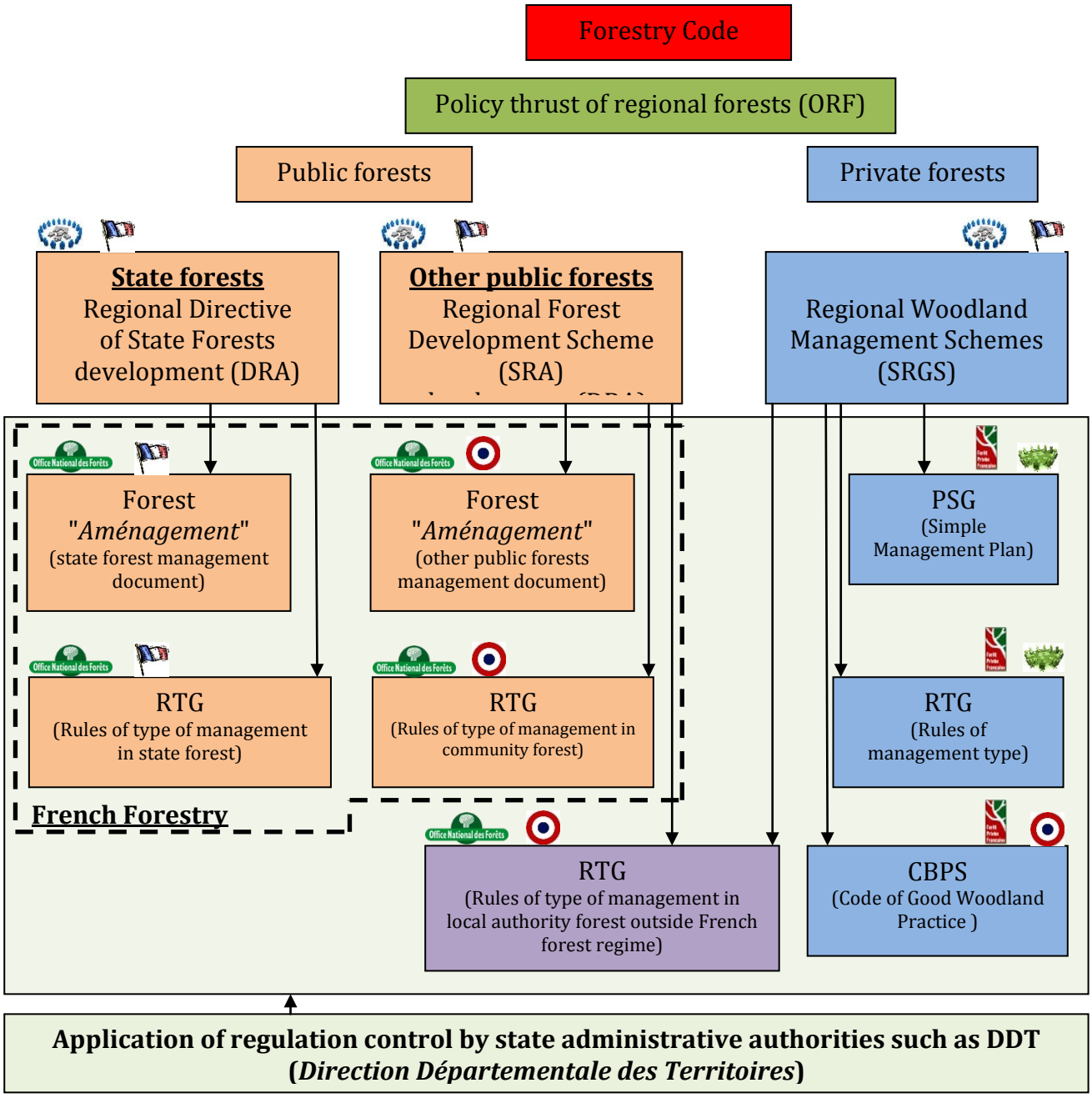

Fig. 29: Organisation of the creation, approval and control of forest management documents

Validation	Minister	Regional Prefect	Management Board of CRPF
Production of document	ONF	CRPF	CRFPF

5.3 Funding schemes for forest management activities

In the past the FFN could benefit from funds coming from a specific tax and was therefore almost independent of annual budgeting. But since the end of this funding tool was decided, there has been no other possibility proposed for the creation of activities for forest development or protection. Currently various institutions hope that the carbon funds could in the future support the forest development.
The additional tax, the TFNB[12], is used by the chamber for agricultural matters to create activities favouring the development of the forest sector.
Part of this tax is transferred to the CRPF and the association of forest communities. The federations of timber-related industries, among them *France Bois Forêt*, who receive the funds collected by the "Obligatory Voluntary Contribution" (*Contribution Volontaire Obligatoire* or CVO)[13] distribute this money by funding projects or studies contributing to the development of the forest sector.
The traditional funds are those from the provincial and regional councils as well as the state via the MEDDE[14] or the MAAF[15], plus the European funds provided through the programmes financed by ERDF[16] or EAFRD[17]. In addition to these different funds, a counterpart is required which is often provided by the communities, associations of local authorities or community federations.
The state transfers the funding more and more towards the regional councils.
The state finances the ONF[18] via the MAAF in order to guarantee the forest management planning.
In communal forests, the funding of the forest regime is 85% provided by a "compensatory payment" by the state (MAAF) allocated to the ONF in addition to the payment of "cost for the forest districts" (about 15%) paid by the communities (on the basis of the income created by their forests).
In the state forest, the state as owner renounces the products from its property. The incomes from the state forests are reinvested in the forest management and forest infrastructure. The ONF earns an income by offering various services and technical studies.
For the important role given to the CNPF[19] and the regional delegations (CRPF[20]) by the forest law in private forests, the former are two-thirds financed by the state and the land tax (via the chambers of agricultural matters) and one-third by the regions and provinces for specific actions.

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[12] Tax on non-built land
[13] Contribution paid by the wood industry
[14] Ministry of Environment, Sustainable Development and Energy
[15] Ministry of Agriculture, Food and Forest
[16] European Regional Development Fund
[17] *European Agricultural Fund for Rural Development*
[18] National Forest Adminstration (*Office Nationale des Forêts*)
[19] National Centre of Forest Property (*Centre Nationale de la Propriété Forestière*)
[20] Regional Centre of Forest Property (*Centre Régionale de la Propriété forestière*)

5.4 The classic type of studies and development activities

Studies:

- Infrastructure planning (for the planning of new forest infrastructure).
- Resource studies.
- Planning of supply of building and energy timber. This is an evaluation of the resources, costs of mobilisation and logistics.
- The Plan for the Development of a Massif (*Plan de développement de Massif* or PDM) is a study that evaluates the actions necessary in order to harvest more in private forests, for example via animation activities.
- The Charter for the Development of Territorial Forest (*Charte Forestière de Territoire*) brings together all relevant stakeholders in the forestry sector in order to establish the development strategy and the actions for its implementation.

Actions:

- Creation of forest infrastructures improving accessibility.
- Animation in order to convince forest owners to change their management practice.
- Training.
- Creation of storage areas and turning areas.
- Actions in favour of creating associations of forest owners.

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