Criterion 3

Maintenance and encouragement of productive functions of forests (wood and non-wood)

INDICATOR 3.1

Balance between net annual increment and annual fellings of wood on forest available for wood supply

Forest stands available for wood supply (excluding poplar plantations)

⇨Note : owing to the initially very cautious application of the increment assessment method of the Inventaire forestier national (IFN), the 1989 results were underestimated by about 12.7% and those for 1994 by about 4.4%. The results in the table have been corrected. The relative imperfection of these estimates should be noted; they are due to partial overlap of the increment data (due to the timeframe of the inventory operations) and the felling data. IFN's new annual inventory method should improve these evaluations.

		1983-87	1988-92	1993-97	1998-2002	Annual variation rate 1988-2002*
Net current production (increment + recruitment - mortality)	x1,000 m³	71,805	75,929	81,727	88,331	1.5%
	m³/ha/an	5.4	5.6	6.0	6.4	1.2%
Fellings	x1,000 m³	48,185	52,864	51,406	61,011	1.4%
Ratio of fellings to net current production	**%**	**67.1%**	**69.6%**	**62.9%**	**69.1%**	**-0.1%**

* focused on the 1990-2000 period

(Source: IFN, only for inventoried forests available for wood supply, excluding poplar plantations, and SCEES/EAB. Net current production is the sum of the current increment of trees eligible for inventory, recruitment and increment in the form of felled trees, after deducting the mortality rate, for the 5-year period preceding the inventory. Fellings represent the sum of the marketed removals and self-consumption. Marketed removals were evaluated on the basis of an annual survey of the branch (5-year means), obtained by reincorporating the bark volume (conifers) and the logging losses, estimated at 10% of the EAB volume, and subtracting poplar construction timber. Self-consumption was evaluated on the basis of the combined results of the two most recent inventories available in each department; it is the difference between the estimated global fellings and the EAB results during the period between inventories; it was estimated at 14,418 thousand m3/year for the 1983-1997 period and 18,396 thousand m3/year for the 1998-2002 period. The increment data presented for 1983-87, 1988-92, 1993-97 and 1998-2002 correspond to the years 1989, 1994, 1999 and 2004, respectively, for which IFN inventory data are available.)

Commentary: the productivity of French forests has been sharply increasing over the last 10 years and has now reached 6.4 m³/ha/year. There are many reasons for this trend. The scale of the afforestation and reforestation under way over the last 50 years is a clear factor, as these stands are now in full growth, and also because of the use of species prized for their productivity (white conifers, Douglas fir). It is likely that environmental changes have also played a role in this rise in productivity but their contribution cannot yet be established with certainty (increase in nitrogen deposition in forests and in atmospheric CO2 levels, climatic warming, etc.). To place these data in a wider perspective and despite the high uncertainty concerning the equivalence of measured volumes, the Daubrée statistics for 1908-1913 should be mentioned as they indicated a total annual production of 23.5 million m³, corresponding to a productivity level of 2.3 m³/ha/year, excluding the Alsace-Lorraine region.

The felling rate between 1998 and 2002 was 61 million m³ per year. This is a sharp rise in comparison with the 1993-97 period, mainly due to the high windfall volume in 1999. This assessment is likely lower than the actual felling rate since the increase in self-consumption windfall volumes could only be taken into account in the departments inventoried by Inventaire forestier national (IFN) after the storms.

This underestimation is likely partially offset by relating the fellings to the net production (itself underestimated)–the mean for the 1992-96 period was that used for the IFN production assessment. Again IFN's new annual inventory method should overcome this problem by providing recent volume production estimates.

The resulting felling rate, i.e. 69% for 1998-2002, is lower than that noted 10 years earlier (Figure 12). This indicates that there is generally no risk of overlogging in French forests. Fellings are actually increasing at a slower pace than net production, excluding high windfall periods. Hence, it is essential that timber mobilisation initiatives be continued, especially in some types of stand in certain regions.

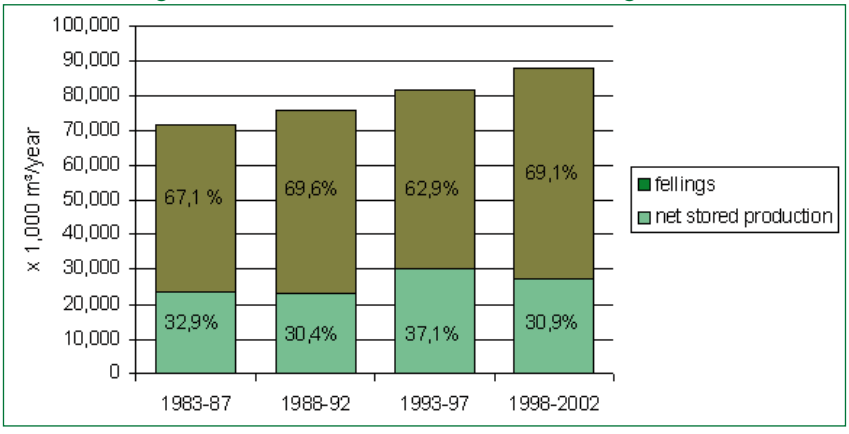


Figure 12: Variations in net stored production* and fellings (source: IFN and SCEES)
* increment + recruitment - mortality

FAO and the United Nations Economic Commission for Europe (UN-ECE) conducted a survey on temperate and boreal forest resources in year 2000 (TBFRA 2000). It provided a few elements of comparison concerning fellings noted in Europe in forests available for wood supply. The felling rate in France falls between that of Mediterranean countries (Spain 39%, Italy 47%) and Germany (55%) and that of Scandinavian countries (Sweden 77%, Finland 75%) and Poland (77%).
Finally, self-consumption volumes represent a very high proportion of total fellings (30-40%). They correspond to the unmarketed removal volume (fuelwood, posts, etc.), which is very hard to estimate–a more accurate evaluation would be needed be able to more reliably and accurately follow up this indicator.

Poplar plantations

Commentary: the poplar situation is very unique in French forestry because of its growth cycle, generally lasting 15 to 25 years, and its planting is managed in a cyclical manner resembling the strategy adopted for certain agricultural products. The fellings/production ratio remained at a historically high level over the past decade, especially in 1988-92, when the ratio was 130% of the overall stand production. This has led to substantial rejuvenation of French poplar plantations. Since then, removals have sharply declined despite the high windfall volume in 1999, estimated at 4 million m³ by the Association forêt-cellulose (AFOCEL). The annual felling rate for the 1998-2002 period decreased to 74%, i.e. 2.1 million m³/year.

These figures are uncertain because removals of industrial timber (not estimated but probably low) were not included, and also because part of the construction timber declared to the Enquête Annuelle de Branche (EAB) likely came from forests, not from cultivated poplar plantations. Poplar is indeed also found in forests, with a net current production estimated in the last inventory at more than 500,000 m³/year, without even counting aspen, which had a net current production of 1.2 million m³/year.

		1988-92	1993-97	1998-2002	Annual variation rate 1988-2002*
Mean per-ha IFN production(increment + recruitment)	m³/ha/year	10.9	11.2	11.0	0.1%
SCEES/Teruti area of poplar plantations and scattered poplars	x1,000 ha	240	256	260	0.8%
Teruti extrapolated total IFN production	x1,000 m³/year	2,622	2,861	2,863	0.9%
Fellings (only timber)	x1,000 m³/year	3,438	2,703	2,114	-4.7%
Ratio of fellings to mean production	**%**	**131%**	**94%**	**74%**	**-5.6%**

* focused on 1990-2000 period

(Source : IFN for the production data and SCEES/Teruti and EAB for the area and fellings. The production evaluated by IFN in cultivated poplar plantations is the mean production, not the current production as in forests; the selected value is the mean production of poplar plantations over 15 years old; this value was extrapolated to the area of cultivated and associated poplar plantations and scattered poplars estimated in the Teruti survey of SCEES in 1993, 1998 and 2003 (codes 24 to 26). Fellings were evaluated on the basis of EAB declared poplar timber removal values and increased by 10% logging losses (5-year means). Production data presented for 1988-92, 1993-2002 correspond to the years 1994, 1999 and 2004, respectively, for which IFN data are available.)

INDICATOR 3.1.1
Forest accessibility

Forest stands available for wood supply (excluding poplar plantations)

Area

logging class	1989 x1,000 ha	1989 %	1994 x1,000 ha	1994 %	1999 x1,000 ha	1999 %	2004 x1,000 ha	2004 %	1994-2004 annual variation rate
easy	8,174	61.3%	8,253	61.4%	8,366	61.5%	8,541	61.8%	0.3%
average	1,516	11.4%	1,469	10.9%	1,464	10.8%	1,426	10.3%	-0.3%
difficult	3,330	25.0%	3,483	25.9%	3,587	26.4%	3,671	26.6%	0.5%
very difficult	313	2.3%	239	1.8%	180	1.3%	183	1.3%	-2.6%
Subtotal	**13,333**	**100.0%**	**13,444**	**100.0%**	**13,597**	**100.0%**	**13,821**	**100.0%**	**0.3%**
unspecified	4		127		270		270		
Total	**13,337**		**13,571**		**13,867**		**14,091**		**0.4%**

IFN stem volume (7 cm top diameter)

logging class	1989 growing stock (x1,000 m³)	1989 % growing stock	1994 growing stock (x1,000 m³)	1994 % growing stock	1999 growing stock (x1,000 m³)	1999 % growing stock	2004 growing stock (x1,000 m³)	2004 % growing stock	1994-2004 annual variation rate
easy	1,066,940	62.0%	1,146,185	61.8%	1,227,941	61.7%	1,312,382	61.7%	1.4%
average	192,531	11.2%	199,565	10.8%	207,128	10.4%	216,129	10.2%	0.8%
difficult	427,830	24.8%	476,949	25.7%	529,799	26.6%	567,541	26.7%	1.8%
very difficult	34,846	2.0%	31,031	1.7%	25,996	1.3%	31,149	1.4%	0.0%
Subtotal	**1,722,148**	**100.0%**	**1,853,730**	**100.0%**	**1,990,864**	**100.0%**	**2,127,201**	**100.0%**	**1.4%**
unspecified	402		unknown		unknown		unknown		
Total	**1,722,550**		**1,853,730**		**1,990,864**		**2,127,201**		**1.4%**

(Source : IFN, excluding poplar plantations, criterion determined only for inventoried forest stands available for wood supply. The "unspecified" category combines inventoried forests without logging codification (1989) and non-inventoried accessible forests (1994, 1999 and 2004)

Commentary: conditions in over 60% of the inventoried forest area are currently easy for logging (cf. definitions in Appendix 7). The same proportion also applies to growing stock (Figure 13). However, around 4 million ha are difficult to very difficult to log, for a growing stock of 600 million m³, or 28% of the total inventoried volume. This mean value conceals the marked differences between regions. Of course, the greatest difficulties are found in mountain regions, thus boosting this rate to above 50% in Languedoc-Roussillon (55%), Midi-Pyrénées (55%) and Rhône-Alpes (66%) regions, with peaks at 71% in Provence-Alpes-Côte d'Azur and 73% in Corsica.

An analysis of changes in hauling distances revealed that accessibility has been improved for around 600,000 ha in the last 10 years, representing 12% of stands where logging is average to very difficult (excluding extensions of forest area).

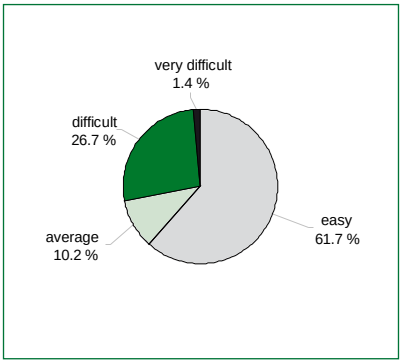


Figure 13: Growing stock per logging class (source: IFN, 2004)

INDICATOR 3.2

Value and quantity of marketed roundwood

Quantity of marketed roundwood

Commentary: after a relatively steady period in the 1960s and 1970s, marketed removals sharply increased in the 1980s to hover around 35 million m³ per year until 1999 (Figure 14). There were many sudden fluctuations during this latter period associated with severe storms (1982, 1984, 1987, 1990) and economic conditions (1993). The peak removal rates noted in 2000 and 2001 highlights the unprecedented severity of the last storms, with 46 and 40 million m³ mobilised, respectively. In 2002, removals had decreased to the prestorm level, but subsequently declined in 2003 in all usage categories. The mean annual removal rate for the 1998-2002 period was 38.5 million m³, including 63% construction timber, 30% industrial wood and 7% fuelwood (marketed). The proportion of softwoods has been increasing to the current rate of 60%, as compared to 51% for the 1988-92 period. This phenomenon cannot solely be explained by the high volume of softwood windfalls available and the fact that many reforested stands are now beginning to yield, i.e. removals of hardwood construction timber dropped sharply from 8 million m³ before the storms to 6 million m³ in 2002 (Figure 15). This decline continued in 2003, with a removal rate of only 5.7 million m³. This trend involves the three main hardwood species, with construction timber removals of oak dropping by 13%, of beech by 42% and of poplar by 36% between 1999 and 2003. In 2003, softwood construction timber removals had risen to the 1999 level, but the patterns vary for the different species–removals of species that were hard hit by the storms decreased substantially (fir-spruce 109,000 m³; maritime pine 300,000 m³), whereas removals of Douglas fir increased dramatically by around 700,000 m³. Windfalls thus seem to have only partially affected the increment potential of this latter species.

The peak in industrial wood removals associated with the 1999 storms only concerned softwoods (Figure 16). In 2003, industrial hardwood and softwood removals had recovered the 1998 level. Despite this ostensible stability, there were marked variations between species, especially softwoods, i.e. maritime pine pulpwood removals dropped by more than 300,000 m³, while fir-spruce and Douglas fir continued to increase.

The marketable share of fuelwood removals was very small relative to the total fuelwood removal volume. The rate declined just after the storms when windfalls were being logged, but then by 2002 it had risen to the prestorm level. There was a subsequent decline again in 2003, but the factors underlying this trend are hard to analyse since no accurate data on fuelwood self-consumption are currently available.

Usage category	Marketed volume (x 1,000 m³/year)				Annual variation rate 1988-2002*
	1983-87	1988-92	1993-97	1998-2002	
marketed construction timber	19,118	22,729	20,794	24,345	0.7%
marketed industrial wood	10,004	10,909	10,883	11,575	0.6%
marketed fuelwood	1,968	2,669	2,646	2,608	-0.2%
Total	**31,090**	**36,307**	**34,323**	**38,528**	**0.6%**

* focused on the 1990-2000 period

(Source : SCEES/EAB, raw data, 5-year means, without correction for bark or logging losses)

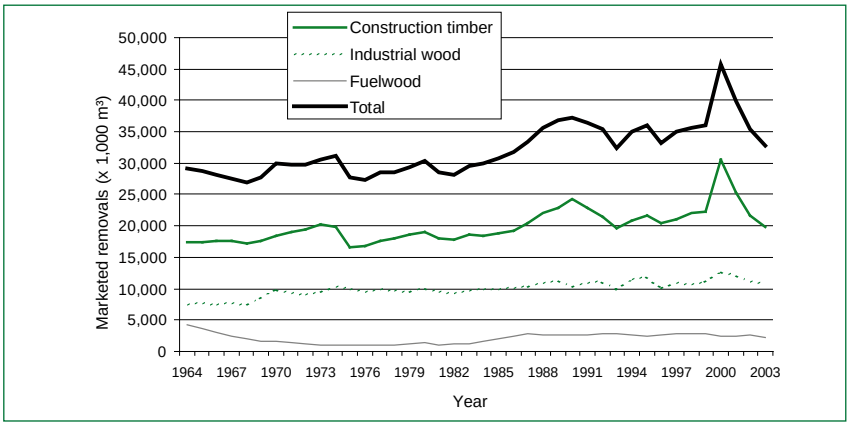


Figure 14: Variations in marketed removals declared to EAB from 1964 to 2003 (source: SCEES)

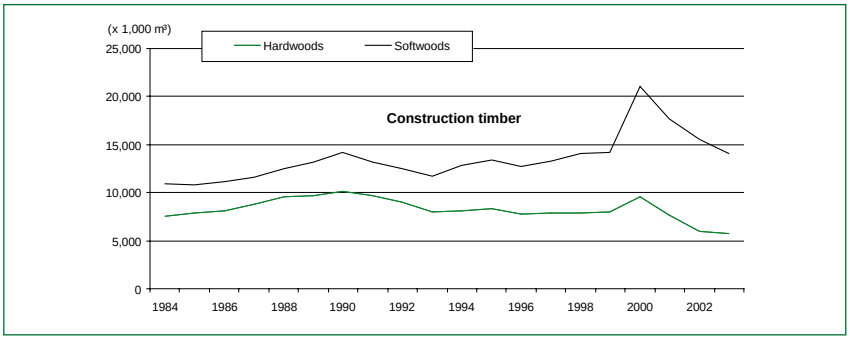


Figure 15: Variations in construction timber removals declared to EAB from 1984 to 2003 (source: SCEES)

Figure 16: Variations in industrial wood removals declared to EAB from 1984 to 2003 (source: SCEES)

Value of marketed roundwood

Commentary: the value of marketed roundwood has been declining steadily for 10 years, in all usage categories, to reach €1,685 million per year over the 1998-2002 period.
Relative to marketed volumes, the m³ value dropped from €51.2 to 43.7 over the last 5 monitored years, i.e. a decrease of 3.1% per year. The value of construction timber decreased from €65.8 to 55.8 per m³, with the fuelwood value dropping from €37.5 to 32.3 per m³. The most marked proportional decrease was noted in industrial wood (-4.8%), dropping from €26.7 to 20.9 per m³. However, the slump in the construction timber value has had the greatest impact on the overall wood value–this decline was accentuated by the 1999 storms.

Usage category	Wood value after logging (million euros 2002/year)			Annual variation rate 1991-2002*
	1991-92	1993-97	1998-2002	
marketed construction timber	1,522	1,367	1,359	-1.4%
marketed industrial wood	299	291	241	-2.7%
marketed fuelwood	107	99	84	-2.9%
Total	**1,929**	**1 757**	**1 685**	**-1.7%**
Wood value in euros/m³	**53.7**	**51.2**	**43.7**	**-3.1%****

* focused on the 1992-2000 period
** 1993-2002 period, variation rate for the 1995-2000 period

(Source : SCEES/Agreste, survey on wood values after logging; no data are available on wood values prior to 1991)

This situation is critical for private forest owners, whose income is declining yearly (cf. also § 6.3).

INDICATOR 3.2.1
Cellulose fibre recovery and recycling; by-product processing

Recovery and recycling of paper and cardboard

	1988	1993	1998	2003	Annual variation rate 1993-2003
Recovery rate	34.2%	36.0%	43.7%	54.4%	4.2%
Utilisation rate (recycling)	44.5%	47.4%	53.8%	58.2%	2.1%

(Source : COPACEL; the recovery rate is the quantity of paper and cardboard recovered relative to overall paper and cardboard consumption; the utilisation rate is the recycled paper and cardboard consumption relative to overall paper and cardboard consumption)

Commentary: the rate of used paper and cardboard recovery has continued to increase at a steady pace with the development of separate collection of these products and mobilisation of the paper industry. It increased from 43.7% in 1998 to 54.4% in 2003, but is still lower than rates in

Scandinavian countries (67.6-72.9%) and Germany (73.7%). More than 80% of the paper and cardboard that is recovered comes from the industrial sector.

Apparent consumption of paper and cardboard was estimated to be 10.9 million t in 2003, or 180 kg per capita, with France ranking 4th in Europe and 7th worldwide in terms of this consumption.

Paper and cardboard production was estimated to be 9.9 million t in 2003. Recycled fibres account for 58.2% of the raw material used by the paper and cardboard industry (utilisation rate).

The growth in used paper recycling is, however, more a response to industrial (reducing paper industry expenditures) and waste management priorities than to forest protection concerns, especially since forest felling rates are moderate in France (cf. § 3.1).

By-product processing

Commentary: the overall quantity of processed sawmill by-products reached 7.6 million t in 2003 (offcuts, chips, bark, sawdust). The increase that began more than 15 years ago is still under way, but at a slower pace. The ratio with respect to processing of sawnwood, cask wood and railway ties was 0.78 t/m³ in 2003. The pulpwood share has been decreasing with time but is still over 50%.

	Units	1988	1993	1998	2003	Annual variation rate 1993-2003
Processed sawmill by-products	x 1,000 t	5,298	6,263	7,583	7,599	2.0%
including by-products for pulping	x 1,000 t	3,240	3,623	4,312	4,197	1.5%
Production of sawnwood, cask wood and railway ties	x 1,000 m³	10,269	9,319	10,220	9,756	0.5%
Processed by-products / Production of sawnwood, cask wood and railway ties	**t/m³**	**0.52**	**0.67**	**0.74**	**0.78**	**1.5%**

(Source : SCEES/EAB, raw annual data)

Wood by-product utilisation enhances sawmill cost-effectiveness, reduces pulpwood industry supply expenses, while boosting wood-use efficiency.

INDICATOR 3.2.2
Marketing wood felled in certified forests*

* wood from certified sustainably managed forests that has been logged by certified enterprises

Commentary: the volumetric proportion of certified wood in marketed removals is still very low, i.e. 7.8% or 2.5 million m³. Volumes nevertheless tripled between 2002 and 2003, a trend which highlights the vitality of the certification process implemented in France, involving both forest owners and downstream subsectors.
Construction timber accounts for 60% of all certified wood, while industrial wood represents 30%, proportions that are consistent with the total marketed volume shares.

These results can be directly related to the extent of certified area, which accounted for almost a quarter of the forest area in late 2004 (cf. Appendix 8). There are two certification systems in France, i.e. the Program for the Endorsement of Forest Certification schemes (PEFC) and the Forest Stewardship Council (FSC). French forest owners prefer the PEFC system because it helps to overcome the land parcelling problem (cf. § 6.1)–forest certification is achieved at the regional level despite the fact that each forest owner or group of owners has to subscribe.

Virtually all state-owned forests are now certified as well as a third of other public forests. It is harder to implement the certification process in private forests because of the high number of forest owners involved, but considerable progress has been made, with more than 10% of the private forest area already certified. The current extent of certified forest area reflects the commitment of French forest owners in the sustainable forest management certification process, and this obviously reaches well beyond the wood marketing issue.

Quality	Certified marketed volume*				Variation rate
	2002		2003		
	m³	% total marketed	m³	% total marketed	
Construction timber	382,800	1.8%	1,522,900	7.7%	298%
Industrial wood	150,400	1.3%	775,800	7.2%	416%
Fuelwood	97,900	3.6%	246,600	10.8%	152%
Total	**631,100**	**2.2%**	**2,545,300**	**7.8%**	**303%**

(Source : SCEE/EAB, 2002 et 2003, raw data - without correction for bark or logging losses)

INDICATOR 3.3

Value and quantity of marketed non-wood goods from forest and other wooded land

Commentary: forests provide a variety of different non-wood goods ranging from venison to gathered plants, including mushrooms, honey and even cork in Mediterranean forests. It is generally hard, due to the very marked fluctuations, to assess the quantities harvested and their value (e.g. for mushrooms, honey, gathered plants). The total mean "wholesale" value of these products ranges from €97 to 109 million per year, which is quite substantial. Venison represents more than half of this total value, with honey representing 20-28% and mushrooms 10-11%, but harvests of these latter two goods can sometimes be very low.

The benefits of these goods go beyond their economic value as they also provide valuable services. For instance, it is now clearly established that cork oak stands are an important element in land-use management and forest fire protection. The importance of the recreational aspect of some plant gathering activities and the key role of bees in maintaining plant biodiversity via pollination are also well known.

Non-wood goods	quantity (t/year)		"wholesale" value (million € 2002/year)		
	1998-99	2002-03	1998-99	2002-03	%
venison*	18,400	22,900	57.831	60.48	55% to 62%
mushrooms (including truffles)	3,100	2,400	15.1	10.8	10% to 11%
cork	5,700 to 8,200	4,700 to 5,700	1.1 to 1.6	1.3 to 2	2%
honey	ND	5,600 to 7,100	ND	19.8 to 30.4	20 to 28%
gathered plants	4,300 to 5,000	4,300 to 5,000	5.1 to 5.4	5.1 to 5.4	5%
Total	**-**	**-**	**-**	**97.5 to 109.1**	**100%**

* including self-consumption

(Source: see detailed tables below. Considering the high values for venison and the low accuracy of the other data, then: 1) the values of other goods were aggregated and expessed in 2001 or 2004 euros without conversion, 2) the totals were considered to correspond to the 1998-99 and 2002-03 periods on average and the results were expressed in 2002 euros. Gathered plant production was also considered to have remained stable as no updated data were available)

Box 4: LEF/ENGREF survey on plant gathering in France

The Laboratoire d'économie forestière LEF ENGREF/INRA of Nancy conducted a survey in 2002, on a sample of 2,575 households selected from a list of telephone subscribers, to record quantities of mushrooms, fruits and decorative goods gathered on a private personal basis by the sampled households in 2001. The results revealed that around 12,650 t of mushrooms, 4,360 t of fruits, including 80% chestnuts (with mulberries, bilberries and raspberries accounting for most of the rest), 330 t of flowers and other decorative elements are gathered yearly. According to the same survey, the hunting harvest for the same household sample included 588,000 wild boars, 444,000 deer and 5.7 million small game animals and birds.

Venison

Commentary: the quantity of hunted venison has sharply increased in recent years, rising from 18,000 to 23,000 t in 4 years. Wild boar accounts for two-thirds of the total, and the quantity is rising faster than the trend noted for deer. The quantity of red and roe deer venison reached 7,400 t during the 2002-2003 season, and this rise is associated with the yearly increase in kills (cf. § 4.9.1).

Venison is usually self-consumed. Its value can only be roughly estimated on the basis of expert opinion since this type of game is no longer sold at Rungis market due to current commercial constraints and regulations. It was estimated at €60.5 million for the 2002-2003 period, including 51% for wild boar and 40% for roe deer.

venison	quantity (t)			value (million € 2002)		
	1998-99	2002-03	annual variation rate	1998-99	2002-03	annual variation rate
red deer	1,617	1,830	3.1%	4.2	4.6	2.3%
roe deer	4,748	5,540	3.9%	24.5	24.9	0.4%
wild boar	12,027	15,486	6.5%	29.1	31.0	1.5%
Total	**18,392**	**22,857**	**5.6%**	**57.8**	**60.5**	**1.1%**

(Source: ONCFS, based on kills by multiplying the values by the mean weights estimated on the basis of expert opinion at 50 kg for a red deer, 12 kg for a roe deer and 35 kg for a wild boar. 1998-99 period: value estimated in F 1998 at 16 F/kg for a red deer, 32 F/kg for a roe deer and 15 F/kg for a wild boar with conversion into 2002 euros. 2002-03 period: value estimated in 2002 euros at €2.5/kg for a red deer, €4.5/kg for a roe deer and €2/kg for a wild boar.)

Mushroom harvest

Commentary: data on forest mushroom harvests are very incomplete. The last in-depth survey by the Fédération nationale des producteurs de champignons was conducted in 1997 and an update is not yet available.
Harvests fluctuate yearly because mushrooms are sensitive to climatic variations. A marked decrease in boletus, chanterelle and truffle harvests has been noted in recent years, i.e. dropping from 4,100 to 2,400 t between 1999-2000 and 2002-2003. Although the reasons underlying this situation are unclear, professional operators fear that this resource is becoming scarce.

The main producing regions are the Massif Central, Périgord and northeastern and southwestern France. The total harvest value is estimated at €15-20 million per year. This should be supplemented with the production for self-consumption, but this is very hard to evaluate. The economic weight of forest mushrooms is far from insignificant, especially in certain regions. French consumption is much higher than the harvest and this gap, currently filled by imports, represents a potential market outlet for the cultivation of forest mushrooms.
The positive role of mycorrhizan mushrooms in the functioning and productivity of forest ecosystems has been known for many years. Continued research on the production of mycorrhizan mushrooms (boletus, saffron milk cap, etc.) and on optimisation of forest management should eventually strike a balance between timber production and edible mushroom production. The latter could provide extra income for forest owners in certain regions, provided that the problem of unauthorised picking can be solved locally.

mushroom category	marketed quantity (t)							"wholesale" value (million € 2001)	
	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	1997-98	2001-02
black Perigord truffles	30	14	35	35	15	39	39	9.6	6.0
1/3 harvested in forests	10	5	12	12	5	13	13	3.2	2.0
other truffles*	ND	ND	ND	ND	ND	ND	17	-	-
boletus	2,120	ND	2,400	1,100	1,000	ND	ND	8.5	4.0
chanterelles	1,000	ND	1,700	1,800	1,400	ND	ND	3.4	4.8
Forest harvest Subtotal	**3,130**	**-**	**4,112**	**2,912**	**2,405**	**-**	**-**	**15.1**	**10.8**
other forest mushrooms	1,710	ND	ND	ND	ND	ND	ND	5.8	-
Forest harvest Total	**4,840**	**-**	**-**	**-**	**-**	**-**	**-**	**20.9**	**-**

* theoretically harvested in forests

(Source: Fédération Nationale des Producteurs de Champignons, Fédération Française des Producteurs de Truffes, Forêt Privée Française et Service des Nouvelles du Marché; in 1997, an in-depth study was conducted by FNPC on forest mushrooms. A new survey is under way but the results are not yet available. The per-kg values used are: 1) for truffles: 2,000 F1997/kg and 400 € 2001/kg - 2001/02 estimate based on 2004/05 rates of SNM evaluated at €490/kg; 2) for boletus: 25 F1997/kg or 4 € 2001/kg, also retained for 2001/02 due to a lack of updated data; 3) for chanterelles and other forest mushrooms: 21 F1997/kg or 3.4 € 2001/kg, also retained for 2001/02 due to a lack of updated data.)

Cork production

Commentary: French cork oak production stands are mainly found in three regions, i.e. Corsica, Var and Pyrénées-Orientales. The annual harvest is evaluated at 4,700 to 5,700 t, but it has been declining over the last 5 years. This decline is linked with overharvesting, as observed in Corsica, and this slump will likely continue in the coming years considering the long rehabilitation cycle for cork (12 years).

Stumpage of cork harvested in the three regions is estimated at €1.3 to 2 million per year, but this is hard to evaluate because average prices estimated on the basis of expert opinion integrate a broad range of qualities and situations.

Cork oak stand management policies have long been focused on different aspects of fire prevention. In recent years, local stakeholders have expressed an interest in enhancing these policies by including a gradual return to production. Different experiments in this direction have been undertaken in the Pyrénées-Orientales and Var regions since 1980. They have enabled the different stakeholders to determine the conditions required for a return to production: the presence of a real production potential for cork of marketable quality, the existence of minimal facilities for access and fire protection, motivation of owners and official control over the choice of lots and monitoring of harvests.

The recent rise in the price of cork due to world shortages could provide a new and interesting opportunity for owners.

Location	Annual harvest (t/year)		Stumpage (million € 2004)	
	1999	2004	1999	2004
Corsica	3,000 to 5,000	2,000 to 2,500	0.6 to 1	0.4 to 0.8
Var	2,000 to 2,500	2,000 to 2,500	0.4 to 0.5	0.5 to 0.8
Pyrénées-Orientales	700	700	0.1	0.4
total	**5,700 to 8,200**	**4,700 to 5,700**	**1.1 to 1.6**	**1.3 to 2**

(Source: Institut méditerranéen du liège; SRFB Languedoc-Roussillon, PACA and Corsica; CRPF PACA; ODARC; 1999 and 2004. The harvest estimates are based on expert opinion.)

Forest honey production

Commentary: the quantity of marketed forest honey ranges from 5,600 to 7,000 t per average year. Acacia honey accounts for more than half of this volume and chestnut honey represents around 30%. This production can fluctuate substantially as a result of weather conditions and other factors– production can sometimes even be null, especially for fir honey. Forest honey accounts for 15-20% of the total honey production in France, which ranges from 30,000 to 40,000 t per year.
The total value of forest honey ranges from €20 to 30 million per average year. Fir honey is the most sought-after type, with a "wholesale" value of €5.5-6 per kg.

Species	Quantity marketed (t/year)	"Wholesale" value (million €)
acacia	3,000 to 4,000	10.5 to 18
chestnut	1,500 to 2,000	4.5 to 7
linden	500	1.5 to 1.8
fir	600	3.3 to 3.6
Total	**5,600 to 7,100**	**19.8 to 30.4**

(Source: Coopérative France miel 2004; mean current production estimated on the basis of expert opinion due to a lack of more accurate statistical data. The production can vary markedly between years, especially for fir honey.)

Gathered plants

Commentary: the annual gathered plant harvest is hard to estimate because this sector is loosely organised and the activity is often marginal. No updated data is currently available to distinguish between gathered forest plants and crops.
The gathered plant harvest estimated in 1997 was 4,000 to 5,000 t, for a value of 5-6 million. Harvesting mainly takes place in the French mountain massifs, i.e. Vosges, Alps, Pyrenees and especially the Massif Central (Cévennes, Auvergne, Limousin). According to the Office national interprofessionnel des plantes à parfum, aromatiques et médicinales (ONIPPAM), most of these harvests are declining, except for lichens for perfumery and cosmetics, where production has remained stable.

Plant type	1997 production (t/year)	Value (million € 2004)
lichen (perfumery and cosmetics)	2,000 to 2,500	0.3 to 0.4
butcher's broom leaves	200	0.4
butcher's broom rhizomes (pharmacy)	150 to 200	0.3 to 0.5
rock-rose leaves and branches (perfumery)	800	1.1
bilberries (cosmetics and pharmacy)	1,000	2.5
linden leafy bracts and flowers	80	0.5
ash leaves	100	0.2
Total	**4,330 to 4,880**	**5.3 to 5.6**

(Source: Office national interprofessionnel des plantes à parfum, aromatiques et médicinales (ONIPPAM) 1997 production data, except for butcher's broom leaves, i.e. 1989 data, due to a lack of available updated data for 2004; 1997 values converted into 2004 euros)

INDICATOR 3.4

Value of marketed services on forest and other wooded land

Marketed services	Ownership category	Value (million € 2003)			Annual variation rate
		1993	1998	2003	1993-2003
Hunting licences	state-owned forest	29.2	29.7	31.4	0.7%
	other public forest governed by forest regulations	16.5	17.8	17.1	0.4%
	private forest	23.7	ND	24.0	0.1%
Total Hunting		**69.4**	**ND**	**72.5**	**0.4%**
Fishing licences	state-owned forest	**0.2**	**0.3**	**0.3**	**2.7%**
Royalties and rental charges	state-owned forest	8.5	8.2	8.4	-0.1%
	other public forest governed by forest regulations	6.9	6.7	6.3	-0.9%
Total Royalties and rental charges		**15.4**	**15.0**	**14.7**	**-0.5%**
All services	state-owned forest	37.9	38.2	40.1	0.6%
	other public forest governed by forest regulations	23.4	24.5	23.4	0.0%
	private forest	23.7	ND	24.0	0.1%
Total All services		**85.0**	**ND**	**87.5**	**0.3%**
		€5.7/ha	**ND**	**€5.7/ha**	**0.0%**

(Source: public forests: ONF; private forests: SCEES/Enquête sur les structures économiques de la sylviculture (ESSES 1976-83) and Enquête sur la structure de la propriété forestière privée (1999) for the leased area; estimation of the mean 2003 hunting licence fee in private forests by applying the increase noted in state-owned forests during the 1993-2003 period to the 1993 value.)

Commentary: forests represent a setting for many services, some of which generate income for the forest owner. This includes hunting and fishing licences, as well as royalties and rental charges in public forests.

The value of these services was evaluated at €87.5 million in 2003, with hunting licences accounting for 80% of this amount. This service value has been increasing over the last 10 years because of the increase in hunting tender fees for state-owned forests. There has only been a slight decrease in royalties and rental charges. Income from fishing licenses in state-owned forests is marginal.
Overall, these services generate a mean income of €5.7/ha, irrespective of the ownership category. This income has remained stable over the last 10 years because the forest area has substantially expanded.

It is hard to estimate the value of hunting licences for private forests since conditions vary widely with respect to hunting in these forests.

A survey of private forest structures conducted by the Service central des enquêtes et études statistiques (SCEES) in 1999 revealed that more than half of the surveyed owners were voluntarily or obligatorily attached to an authorised communal or intercommunal hunting association (ACCA or AICA). This situation concerned 45% of the forest area. A quarter of these owners provide their relatives, friends or local hunting groups with free hunting access to their forests, especially in southern France.

Paid hunting leases apply to 13% of the forest area, but only 2% of private owners. This generally concerns large-scale properties (51 ha on average) belonging to corporate bodies. Only 8% of private owners (16% of the area) maintain exclusive hunting rights in their forests.

Most hunting plots rented in state-owned forests are allocated by public tender, otherwise plots are generally allotted on a licensing or friendly basis.

INDICATOR 3.5

Proportion of forest and other wooded land under a management plan or equivalent

Formal management plans

Ownership category		Units	Managed area					Annual variation rate
			1974	1984	1994	1999	2004	1994-2004
state-owned forest*		ha	1,184,400	1,421,000	1,610,100	1,704,500	1,633,000	0.1%
		%	71.0%	82.3%	90.5%	93.3%	89.1%	-0.2%
other public forest governed by forest regulations		ha	1,316,400	1,650,800	1,983,700	2,197,700	2,193,000	1.0%
		%	54.4%	66.1%	75.0%	80.9%	78.9%	0.5%
private forest	compulsory simple management plan**	ha	94,900	2,345,900	2,479,800	2,551,700	2,487,000	0.0%
		%	2.8%	71.2%	73.9%	75.9%	73.1%	-0.1%
	voluntary simple management plan	ha	-	-	16,700	26,400	35,200	7.7%
	total	ha	94,900	2,345,900	2,496,500	2,578,100	2,522,200	0.1%
		%	-	23.8%	24.0%	24.1%	23.4%	-0.3%
total		**ha**	**2,595,700**	**5,417,700**	**6,090,300**	**6,480,300**	**6,348,200**	**0.4%**
		%	**-**	**38.5%**	**41.1%**	**42.6%**	**41.2%**	**0.0%**

* including state-owned forests allocated to various ministries

** presented % are relative to the area prior to implementation of a simple management plan in compliance with the law

(Source: ONF for state-owned forests and other public forests governed by forest regulations, based on an estimate of current management plans, without taking into account logging regulations for coppices and coppices-with-standards and considering total forested and unforested areas; CNPPF for private forests, with an approved current simple management plan, including voluntary management plans; the percentage of all managed metropolitan forests is calculated on the basis of Teruti survey areas (headings 18 to 21, 24, 25) 1983 (old data series), 1993, 1998 and 2003 (new data series); managed areas were established for 1st January of the concerned year).

Commentary: the French forest area for which a "formal" management plan has been drawn up is currently 6.3 million ha, or 41.2% of the overall area. This area increased by 25,800 ha per year between 1994 and 2004, including 20,900 ha just for non-state-managed public forests. The decline noted in the last 5 years is due to damage incurred by the 1999 storms–many managed areas and simple management plans have been revised and the approval process is under way, especially concerning private forests. Some forest owners are thus also in a standby situation due to financial and technical uncertainty concerning rehabilitation of their forest stands.

A high proportion of public forests are managed, i.e. 89% of state-owned forests and 79% of other public forests governed by forest regulations. Ecological and landscape concerns are now taken into account and managers of each new public forest management plan systematically receive a map of forest sites and of fragile landscapes. Moreover, the steady rise in the number of sites of ecological interest is a definite sign that managers are more aware that it is essential to take forest biodiversity into serious consideration in their management practices. New pilot management projects implement the European "Habitats – Fauna – Flora" directive.

For private forests, 73% of forests whose owners were obliged to draw up a simple forest management plan, i.e. Plan simple de gestion (PSG), are now classified as managed. The forest law passed in July 2001 modified the area threshold for private forests from the previous limit of 25 ha per tenant to the current limit of 10-25 ha, depending on the department concerned (Box 5). The slight decline noted in the last 5 years is a direct result of the storms of December 1999. First, current compulsory PSGs have more than doubled in 5 years, i.e. they represented 105,200 ha in 2004 as compared to 46,500 ha in 1999. Moreover, private forest owners' situations were often disrupted by the damaging storms. With massive stand destruction, problems in clearing the stands and marketing the timber, uncertainty on obtaining reconstruction credits, many owners opted to delay renewal of their PSG while awaiting stabilisation of the situation. However, the 2005 data, which were not taken into account in the table, revealed that compulsory PSG submissions and approvals are again on the increase.

Voluntary PSGs are still increasing, but at a slightly slower pace in comparison to the 1994-1999 period.

In addition, the proportion of managed French forests is much higher than that of forests under a "formal" management plan, especially with respect to private forests. A survey on private forest structures carried out by the Service central des enquêtes et études statistiques (SCEES) in 1999 provided an assessment of the level of involvement of owners in forest development. A quarter of private forest owners–holding around 60% of the forest area–sought information or called in external assistance to enhance management of their forest properties.

These proportions increased as the forest size increased: 89% of owners with 100 ha or more were concerned (91% of the area) as compared to 19% of owners with less than 10 ha (24% of the area). Moreover, half of private forest owners (560,000) were active in maintaining, felling, etc., their stands, alone or with the help of their relatives. This work time is estimated at 20 days per year and per owner, representing more than 11 million work days.

Box 5: Management records required by the French forest law of 9 July 2001

Four management record categories are stipulated under the French forest law of 9 July 2001 (Loi d'orientation forestière du 9 juillet 2001):
- management records
- simple management plans
- model management regulations
- codes of good silvicultural practices

These records must be drawn up in compliance with regional development directives (DRA) for state-owned forests, regional management schemes (SRA) for other public forests governed by forest regulations, and regional silvicultural management schemes (SRGS) for private forests. DRA, SRA and SRGS are defined in the regional forest guidelines (ORF), which in turn are drawn up by regional commissions for forests and forest goods, with the participation of concerned partners.
For **public forests**, the management record is generally a detailed **management record**. It can be replaced by a **model management regulation** (RTG), i.e. a simple record, for forests with a low economic potential and ecological interest.
For **private forests**, a **simple management plan** (PSG) is compulsory for forested properties with an area (for a single tenant) that is equal to or higher than the threshold set for the administrative department, ranging from 10 to 25 ha. An owner with a forest area under the preset departmental threshold, but equal to or above 10 ha, can submit a voluntary PSG. Compulsory and voluntary PSG records are comparable to public forest management documents.
Private forest owners with properties that do not qualify under this category can concur to a **model management regulation** (RTG) drawn up by a common forest management and logging organisation or a forest expert. They can also comply with a **code of good silvicultural practices** (CBPS) drawn up by the Centre régional de la propriété forestière and approved by the prefect of the region. The CBPS contains key sustainable forest management guidelines classified by region or group of natural regions.
Forests managed in compliance with these four management record categories are confirmed as being sustainably managed forests, conditional to a 10-year (minimum) commitment by the owner when they qualify under RTG and CBPS categories. These sustainable management commitments are required to obtain government subsidies.

INDICATOR 3.5.1
Forest area covered by a catalogue of sites and area covered by a simple species guide

Commentary: catalogues of forest sites include, amongst other elements, a description and a key for identifying different forest ecosystems in a natural region. They are developed by scientists, generally on the basis of the results of analyses of the topography and landforms, climatic characteristics, types of rock, soil, humus and vegetation composition.

It was felt that these catalogues should be transformed into clear and easy to use tools that could help forest managers in making accurate ecological analyses of their forest sites– a prerequisite for sustainable management.
Guides were thus drawn up to facilitate identification of forest sites and species–they summarise knowledge in the form of site units with known potentials for the main forest species of one or several natural regions.

Coverage	Forest area covered by a catalogue of forest sites (x 1,000 ha)					Forest area covered by a simple guide (x 1,000 ha)				
	2000		2005		Annual variation rate 2000-2005	2000		2005		Annual variation rate 2000-2005
	forested	total	forested	total	forested	forested	total	forested	total	forested
complete	5,636	18,128	6,742	22,326	3.6%	3,100	9,617	5,102	15,251	10.5%
partial	453	2,257	584	2,596	5.2%	232	1,135	368	1,591	9.7%
total	**6,089**	**20,385**	**7,326**	**24,922**	**3.8%**	**3,332**	**10,752**	**5,470**	**16,842**	**10.4%**
% total France	**43.2%**	**37.1%**	**52.0%**	**45.4%**		**23.6%**	**19.6%**	**38.8%**	**30.7%**	

(Source: IFN, 1/01/2000 and 1/01/2005; calculations were done per IFN departmental forest region while only taking the area actually covered within each region into consideration; data generated by this new method overrule the data series published in the year 2000 version of the present report).

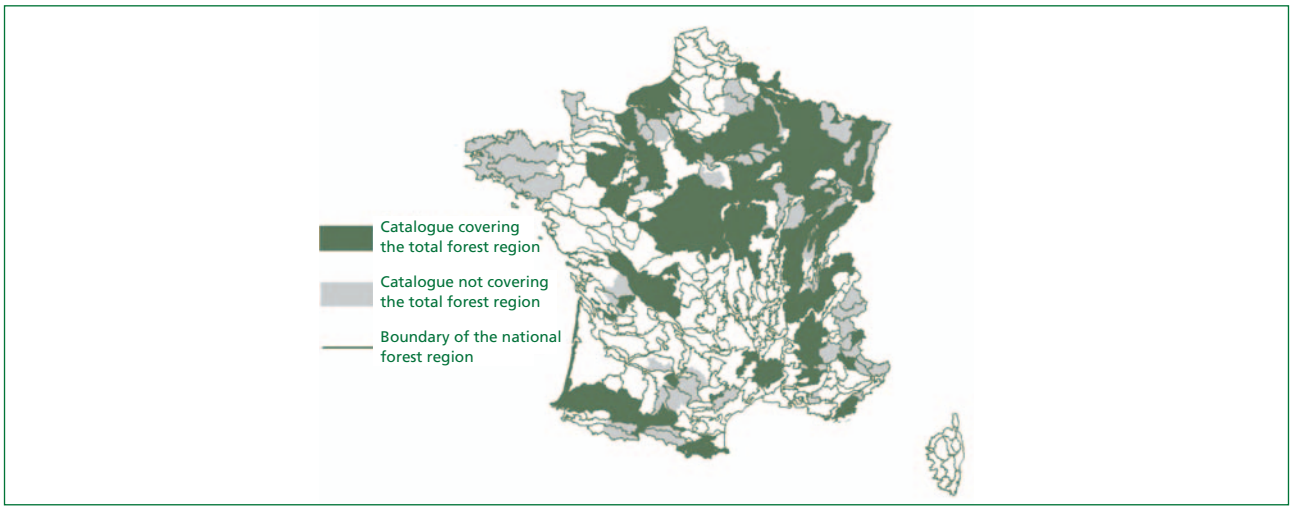
These practical guides (attractive presentation, small size, simple and detailed scientific concepts) can provide forest managers with access to enhanced knowledge on natural production factors concerning their forests, thus facilitating decision making on the best species to plant in their forest stands. These guides are the only reference documents available for some regions when no catalogue of forest sites has been drawn up (Maps 14 and 15).

Since 1992, the Inventaire forestier national (IFN) has been recording ecological and floristic field data. In 2002, IFN was tasked by the French

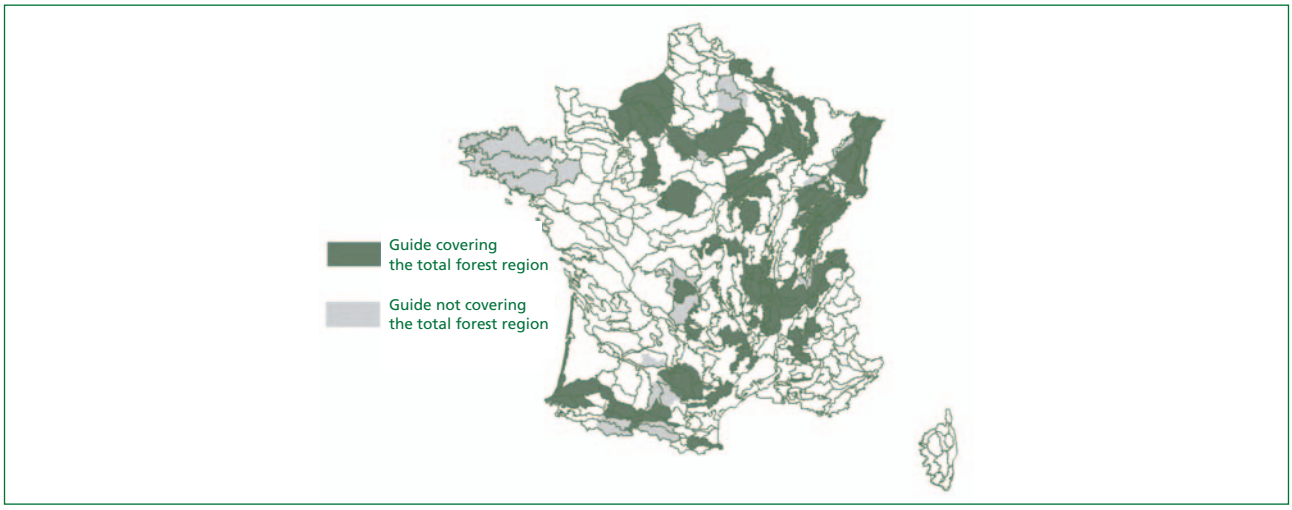
Forestry Ministry to permanently oversee, provide expertise and operational coordination in the field of forest site classification. Areas actually covered by a descriptive record of forest sites were thus recalculated and refined on national forest region and departmental forest region scales. Data generated by this more accurate method overrule the data series published in the year 2000 edition of the present document. The method was used to determine the status of the situation on 01/01/2000, while taking the newly published guides into consideration, which are the only documents likely to be used on a daily basis by public and private forest managers.

Half of the forest area in France, i.e. more than 7 million ha, is currently covered by a catalogue of forest sites (20% increase in 5 years), while slightly more than a third of the area is covered by a simple guide (64% increase over the same period). The guides are thus being published at a much faster pace than the catalogues, which is very encouraging with respect to applying sustainable management concepts in the field. This progress has been more substantial in regions with the harshest forest production conditions, i.e. mountain areas and the Mediterranean region.

Moreover, regions for which a forest site classification is available have a mean forest cover of 30%, which is higher than the national average. This trend indicates that–apart from the Landes de Gascogne region, for instance, for which no classification tool is available to date–the interest generated by the forest site catalogues is generally higher in the most forested regions. This clearly highlights the willingness of public and private managers to conduct ecological analyses as part of their everyday forest management activities.



Map 14: Catalogues of sites available per forest region - Situation 2005 (source: IFN)



Map 15: Simple species guides available per forest region - Situation 2005 (source: IFN)