

# The AFI Network: Monitoring Continuous Cover Forests in Europe



Association *futaie Irrégulière*

## Monitoring on 3 levels & Training in transformation

### AFI Research stands

A European Network of 118 Research stands established over 20 years, recording species mixtures, site types, regional characteristics and geographical spread

Providing baseline information from permanent sample plots

Monitoring dendrological and economic development used in meta-analysis

### Local research stands

Abbreviated protocol to monitor local stand development

Gives a baseline record of individual stand characteristics

Allows forest managers to refine management for forest area from key indicator stands

Gives valuable increment data to determine sustainability and economic performance

Adheres to AFI protocol enabling future upgrade to the Network

### Forest inventory

Sets a systematic grid across a whole forest

The AFI abbreviated protocol applies to all sample plots

Determines baseline growing stock for the whole forest

Provides a record of sustainable management

Quantifies flux in timber quality

Values economic variation of the forest asset

### The Martelloscope

A powerful training tool for continuous cover forestry and single tree selection

1 hectare plot where all the trees are numbered, plotted and identified, measured and graded

In training exercises, trees are selected by recording individual tree numbers

The advanced software provides immediate analysis of results and the trainee selection is scored and set against strategies and optimal cut

**RESEARCH STAND N° 6 - FORÊT DE LA QUIQUENROGNE**

Region: Franche-Comté  
 Departement: Le Vige  
 Area: 8.75 ha  
 Installation: January 1993  
 Manager: Alain Chauvaud

**Stand development**

**Stem distribution**

**Spacial variation**

**General**

**Past management**

**Harvested growing stock**

**Reasons for choosing the stand**

The forest of La Quiquengrogne is known as one of the best examples of beech managed under irregular management. It has been under the same ownership and management since the mid 19th century.

Managed for a long time as standards-cover, irregular management was initiated in 1975. The logging cycle for quality timber is 80 years. The forest is managed for the production of high quality beech with silver fir and sessile oak even if the latter is of poor quality.

**Condition of the growing stock in 2008**

The research stand is made up of 77% beech and is close to the equilibrium growing stock.

Between 1993 and 2008 the standing volume increased slightly. The standing volume increased from 6300 t to 6395 t, the volume of quality timber from 327 to 360 t and the basal area from 14.9 to 18.4 m<sup>2</sup>/ha. During this period the proportion of Large Wood dropped slightly from 42% to 39%. The improvement in capital is due to the improvement in Medium Wood. The drop in diameter increment in the Medium Wood is compensated by an increase in their Basal Area.

The potential value of the stand has remained remarkably constant during the period. In spite of the collapse in the price of beech the manager has kept on harvesting Large Wood in order to maintain growth in the Medium Wood.

The Basal Area of A+B quality stems has remained constant.

The research stand network provides an example of the type of coupes undertaken, in this case quality timber harvesting with a low value timber operation in mid cycle.

**Comments**

This research stand underwent the storm of 1990 forcing the manager to reduce the Basal Area quite significantly in the early 90s. The rapid Basal Area growth enabled a quick recovery. The concentration of standing volume in the Large Wood contributes to a very dynamic management of the stands that have a relatively low Basal Area.

This allows good revenues to be generated even in difficult market conditions as well as maintaining a strong resource for future sales. This stand provides an example of a stand close to equilibrium able to withstand fluctuations in the market as well as climatic deviation.

**Forest** Cransbore 91  
 Date: 21/03/2013  
 N° plots: 11

**Comparative structure and forest capital**

Stand area	SW	MW	LW	SW	MW	LW
AdP	1.9	5.0	4.3	11.2	15	46
Oak P.	0.2	0.6	0.5	2.2	2	6
Sycamore	0.7	1.0	0.2	2.8	6	10
Broadleaves	0.2	1.8	1.8	1	1	2
	3.1	8.7	12.8	27.3	24	64

**Stems per ha by diameter class**

**Discount rate: 3.00%**

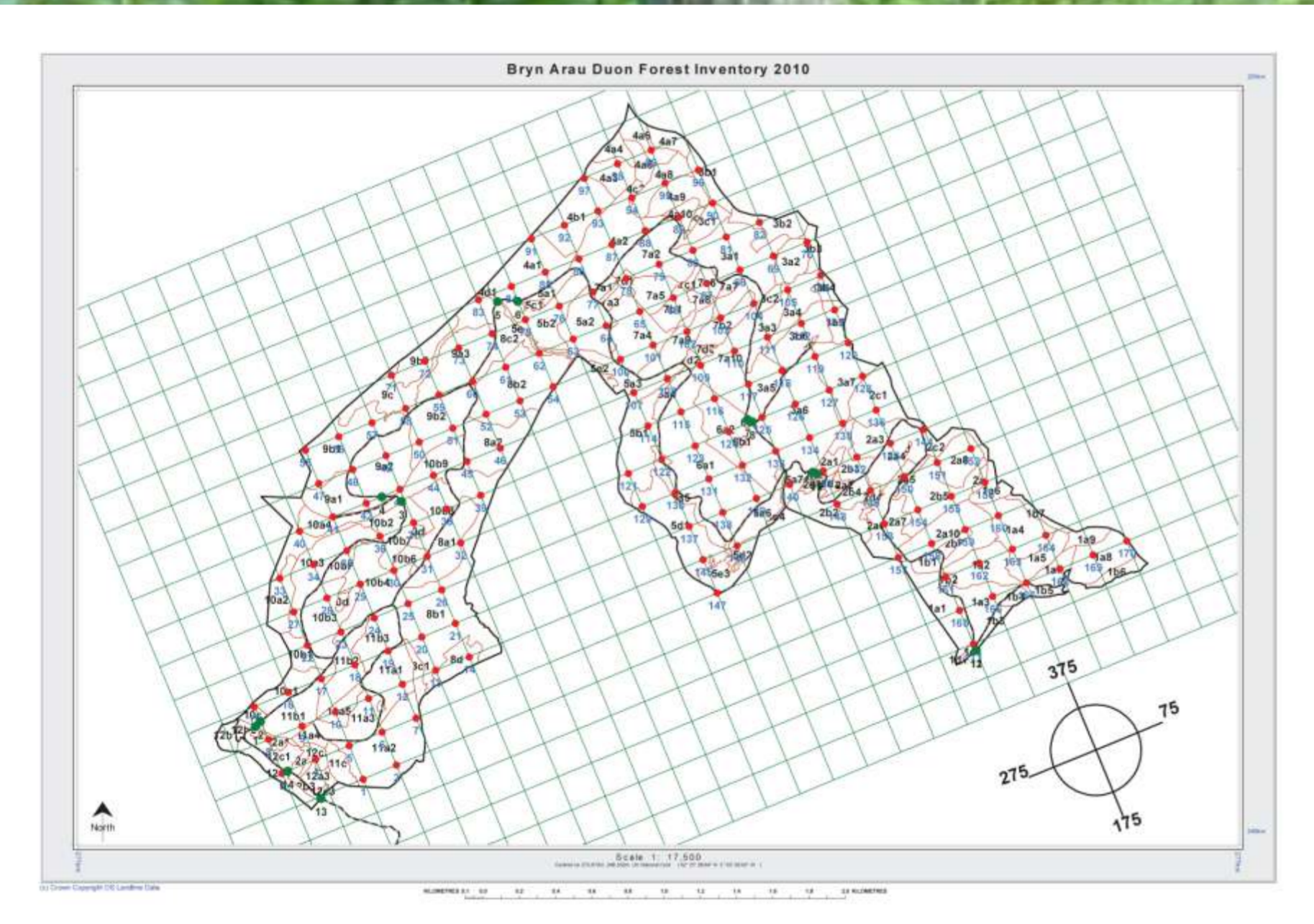
	SW	MW	LW
Basal Area	270	270	270
Standing Timber Value	€15,200	€10,000	€10,000
Regeneration Timber Value	€10,200	€11,000	€11,000
Total value	€25,400	€21,000	€21,000
Annual Value Increment	€12,000	€12,000	€12,000

**Standing Timber Value**

	SW	MW	LW
AdP	2.1	3.200	3.300
Oak P.	11	114	1020
Sycamore	38	106	241
Broadleaves	112	1,400	6,614

**Regeneration**

	SW	MW	LW
AdP	643	126	772
Oak P.	643	126	772
Sycamore	643	126	772
Broadleaves	643	126	772



**Donadae Martelloscope**  
 Area: 1.00 ha

**Initial State**

**Structure**

Structure	No / ha	Vol / ha
70	6	0.8
20	19	4.3
25	22	4.2
30	57	30.1
35	49	38.6
40	43	40.2
45	38	47.9
50	21	36.6
55	6	6.0
60	2	4.9
65	2	5.2
70	1	6.5
75	1	7.8
80	1	7.8
85	1	7.8
90	1	7.8
95	1	7.8
100	1	7.8
Total	306	262.7

**Economics**

	Land Value (€/ha)	Standing Timber Value (€/ha)	Value Increment (€/ha/yr)	Rate of Return (Vol Inc./Total Value)
	2,500	4,825	32.7	5.2%

**Distribution of No of Stems & Vol by Diameter**

**Distribution of Volume by Quality**

Quality	Vol Inc. (m <sup>3</sup> /ha/yr)	Vol Inc. (m <sup>3</sup> /ha)
A	36.5	19.2
B	0.2	0.0
C	7.1	10.0
D	0.4	5.6
E	5.6	15.1
F	4.8	4.8
G	6.3	2.8
H	13.1	28.9
I	1.3	3.8
J	6.2	4.0
K	1.8	13.8
L	8.2	0.4
M	1.4	1.6
N	2.6	1.6
Total	74.1	133.8

**Distribution of Volume by Species**

**Regeneration (no stems per ha)**

Species	SW	MW	LW
Western hemlock	1	1	1
Small leaved lime	1	1	1
Oak spruce	1	1	1
Oak	1	1	1
Norway spruce	1	1	1
Grand fir	1	1	1
European larch	1	1	1
Douglas fir	1	1	1
Beech	1	1	1
Ash	1	1	1