Food and Agriculture Organization of the United Nations

Global Forest Resources Assessment 2020

Report

Italy

Rome, 2020

FAO has been monitoring the world's forests at 5 to 10 year intervals since 1946. The Global Forest Resources Assessments (FRA) are now produced every five years in an attempt to provide a consistent approach to describing the world's forests and how they are changing. The FRA is a country-driven process and the assessments are based on reports prepared by officially nominated National Correspondents. If a report is not available, the FRA Secretariat prepares a desk study using earlier reports, existing information and/or remote sensing based analysis.

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Introduction

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Introductory text

This report is made by a community composed by people coming from different forest Istitutions (University, Forest Research Istitute, Ministries, National Institut for Statistic, ecc). Please note that the data were entered through percentages, it is possible that there is not a perfect coincidence with the data already published.

1 Forest extent, characteristics and changes

1a Extent of forest and other wooded land

National data

Data sources

1985	**References**	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.
	Methods used	National Forest Inventory
	Additional comments	Hereinafter NFI1985

2005	**References**	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp
	Methods used	National Forest Inventory
	Additional comments	Hereinafter INFC-2005

2015	**References**	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA- MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp
	Methods used	National Forest Inventory
	Additional comments	Hereinafter INFC2005

Classifications and definitions

	National class	**Definition**
1985	Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.
	Other wooded land	Land not classified as "Forest" spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of 5-10 percent or trees able to reach these thresholds ; or with a combined cover of shrubs bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.

2005	National class	Definition
	Forest	Fully consistent with FRA definitions.
	Other Wooded Land	Fully consistent with FRA definitions.

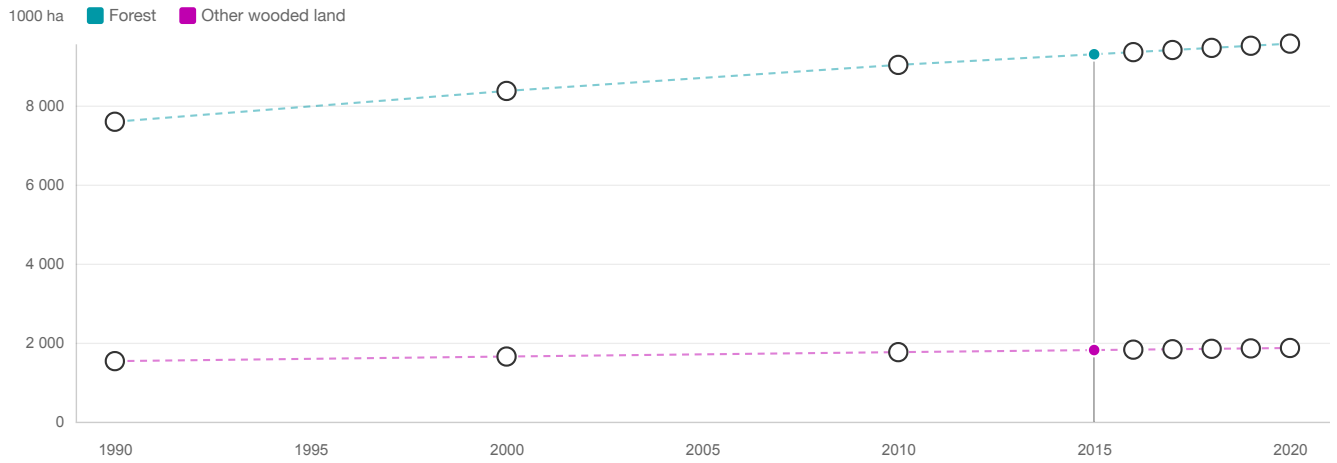
2015	National class	Definition
	Forest	Fully consistent with FRA definitions.
	Other Wooded Land	Fully consistent with FRA definitions.

Original data and reclassification

1985	Classifications and definitions		FRA classes		
	Class	**Area (1000 ha)**	**Forest**	**Other wooded land**	**Other land**
	Forest	7 200.00	100.00 %	%	%
	Other wooded land	1 475.10	%	100.00 %	%
	Total	**8 675.10**	**7 200.00**	**1 475.10**	**0.00**

2005	Classifications and definitions		FRA classes		
	Class	**Area (1000 ha)**	**Forest**	**Other wooded land**	**Other land**
	Forest	8 759.00	100.00 %	0.00 %	**0.00 %**
	Other Wooded Land	1 708.00	0.00 %	100.00 %	**0.00 %**
	Total	**10 467.00**	**8 759.00**	**1 708.00**	**0.00**

2015	Classifications and definitions		FRA classes		
	Class	**Area (1000 ha)**	**Forest**	**Other wooded land**	**Other land**
	Forest	9 297.08	100.00 %	0.00 %	**0.00 %**
	Other Wooded Land	1 813.24	0.00 %	100.00 %	**0.00 %**
	Total	**11 110.32**	**9 297.08**	**1 813.24**	**0.00**


1000 ha
Forest
Other wooded land
8 000
6 000
4 000
2 000
0
1990
1995
2000
2005
2010
2015
2020

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	7 589.75	8 369.25	9 028.04	9 297.08	9 350.89	9 404.70	9 458.51	9 512.32	9 566.13
Other wooded land (a)	1 533.33	1 649.78	1 760.62	1 813.24	1 823.76	1 834.28	1 844.80	1 855.32	1 865.84
Other land (c-a-b)	**20 290.92**	**19 394.97**	**18 625.34**	**18 303.68**	**18 239.35**	**18 175.02**	**18 110.69**	**18 046.36**	**17 982.03**
Total land area (c)	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**	**29 414.00**

The FAOSTAT land area figure for the year 2015 is used for all reference years

Climatic domain	% of forest area 2015	Override value
Boreal	**0.00**	
Temperate	**32.00**	
Sub-tropical	**68.00**	
Tropical	**0.00**	

Comments

1b Forest characteristics

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables		Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest plantations; Forest area	1985		Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA- MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest origin Introduced species area	2005		Hereinafter NFI1985
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015		Hereinafter NFI1985

National classification and definitions

National class	Definition
Naturally originated forest	Consistent with FRA 2005 definition of "modified natural forest"
Seminaturally originated forest	Consistent with FRA 2005 definition of "semi natural forest"
Artificially originated forest	Aggregated class including protective and productive plantations of several species
Old-growth highly protected forest	Forest located in the core areas of natural national parks

Original data

1985 data

National classes	Area (ha)
Forest Plantations (introduced species)	134100
Total Forest Area	7200000

2005 data

National classes	Area (ha)
Naturally originated forest	1485354
of which:	
Old-growth highly protected forest	93127
Seminaturally originated forest	6671399
Artificially originated forest (planted forest)	602448

Forest dominated by invasive species (Black locust and *Ailanthus altissima*)	233553
Productive Plantations	122252
of which:	
Poplar plantations	66269
Eucaliptus plantations	19626
Other broadleaves plantations	21359
Douglas plantations	2598
Pinus radiata plantations	2978
Other introduced coniferous plantations	1835
Indigenous conifers plantations	7587
Total Forest Area	8759200

2015 data

National classes	Area (ha)
Total Forest Area (provisional estimate)	9297078

Analysis and processing of national data

Estimation and forecasting

The area of self regenerated introduced species for the years 1990, 2000, 2010 and 2015 has been estimated applying the same percentage (black locust + ailanthus / Total of Other naturally regenerated Forest) retrieved from the 2 nd NFI for the year 2005.

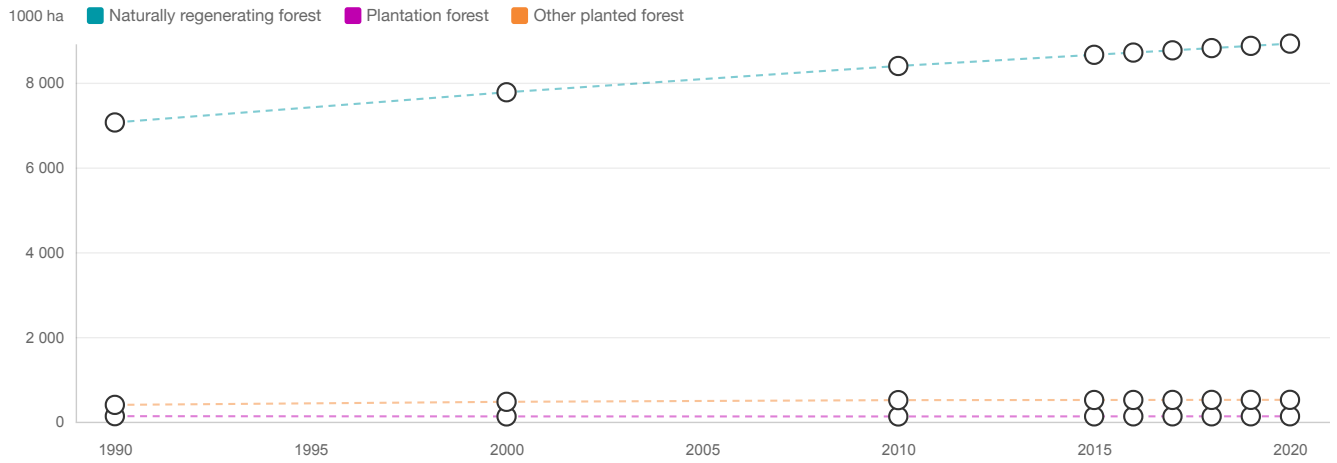
As regards planted forest, 1985 NFI provided information limited to productive plantations. The 1985 extent of Other Planted Forest has been estimated applying the same ratio of Other Planted Forest against Total Forest Area found by 2005 NFI. This ratio is equal to 5.48%, being the 2005 extent of Other Planted Forest equal to 480 196 ha (Planted Forest minus Productive Plantations). Missing values for intermediate reporting years have been calculated by means of a linear interpolation while 2010 and 2015 figures for planted forest were obtained by applying the same proportion of planted forest reported for 2005 to the updated total forest area for those years.

The area of planted introduced species for the years 1990 and 2000 has been estimated by linear interpolation of 1985 and 2005 data; the latter has also been repeated for 2010 and 2015.

Reclassification into FRA 2020 categories

	Naturally regenerated	**Other Planted Forest**	**Plantation forest**	**Plantation of Introduced species**
Naturally originated forest	100%			
Old-growth highly protected forest	100%			
Seminaturally originated forest	100%			
Artificially originated forest (planted forest)		50%	50%	
Forest dominated by invasive species (Black locust and *Ailanthus altissima*)	*100%*			
Productive Plantations			*100%*	

Poplar plantations			100%	
Eucaliptus plantations			100%	100%
Other broadleaves plantations			100%	
Douglas plantations			100%	100%
Pinus radiata plantations			100%	100%
Other introduced coniferous plantations			100%	100%
Indigenous conifers plantations			*100%*	


1000 ha
Naturally regenerating forest
Plantation forest
Other planted forest
8 000
6 000
4 000
2 000
0
1990
1995
2000
2005
2010
2015
2020

FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	7 061.01	7 773.74	8 393.77	8 657.44	8 710.17	8 762.90	8 815.63	8 868.36	8 921.09
Planted forest (b)	**528.75**	**595.51**	**634.26**	**639.64**	**640.71**	**641.78**	**642.85**	**643.92**	**644.99**
Plantation forest	131.10	125.45	124.53	126.44	126.82	127.20	127.58	127.96	128.34
…of which introduced species	123.84	103.67	93.43	93.28	93.25	93.22	93.19	93.16	93.13
Other planted forest	397.65	470.06	509.73	513.20	513.89	514.58	515.27	515.96	516.65
Total (a+b)	**7 589.76**	**8 369.25**	**9 028.03**	**9 297.08**	**9 350.88**	**9 404.68**	**9 458.48**	**9 512.28**	**9 566.08**
Total forest area	**7 589.75**	**8 369.25**	**9 028.04**	**9 297.08**	**9 350.89**	**9 404.70**	**9 458.51**	**9 512.32**	**9 566.13**

Comments

Note that the data were entered through percentages, it is possible that there is not a perfect coincidence with the data already published. Below the table with original data:

FRA categories	Area					
	1985	1990	2000	2005	2010	2015
Naturally regenerating forest	6.671.182	7.042.575	7.785.360	8.156.752	8.407.194	8.657.636
Planted forest	528.818	547.225	584.040	602.448	620.945	639.443
…of which plantation forest	134.100	131.138	125.214	122.252	124.368	126.484
…of which other planted forest	394.718	416.087	458.826	480.196	496.577	512.959
Forest	7.200.000	7.589.800	8.369.400	8.759.200	9.028.139	9.297.078

Category	Comments related to data definitions etc	Comments on reported trend
Planted forest	Italian planted forest is mainly represented by protective plantations devoted to prevention of soil erosion. Productive plantations, especially poplar stands, are important as well and represent on average the 20% of the planted forest. The present estimation of planted forest has been based on NFI-2005 final results, made available in 2007.	Due to the augmented attention towards environmental protection, exotic species plantations are decreasing in extent.

1c Primary forest and special forest categories

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest; Other Wooded Land; Forest extent; Natural Regeneration	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA- MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest; Other Wooded Land Forest extent; Natural Regeneration	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI2015
4	FAOSTAT	Total area; Inland water	1990 2000 2005	N/A
5	De Natale F. et al., 2003 Stima del grado di copertura forestale da ortofoto e applicazione della definizione di bosco negli Inventari Forestali. L'Italia Forestale e Montana n°4: 289-300.	Forest definitions comparability	2003	N/A
6	Administrative data from Regional Rural Development Programmes .Source Ministry of Agriculture/National Institute of Agricultural Economy	Afforestation	1994/2000 2001/2006 2007/2015	N/A

National classification and definitions

Category	Definition
Primary forest	Naturally regenerated forest of native species where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Temporary unstocked areas	Areas temporarily unstocked due to forest harvest, fire or other disturbances

Original data

Tab 2a into FRA 2015

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Primary forest	93	93	93	93	93

Source: Italian NFI (1985 and 2005 data)

Forest Classes	Area (1000 ha) NFI1985	Area (1000 ha) INFC2005
Temporary unstocked areas	99	54

Analysis and processing of national data

Estimation and forecasting

The extent of Italian primary forest according with FRA definition is not well known. Anyway such extent was considered equal to forest cover in core areas of national parks. This data was considered unvaried for the whole reporting period.

Temporay unstocked area was estimated by the two NFIs, NFI1985 and INFC2005. For the reporting year 1990 the area estimated by NFI1985 was used; for the year 2000 the interpolated value between the two NFI estimates was used; from the reporting year 2010 onwards, the temporary unstocked area was considered unvaried and equal to the INFC2005 estimate, based on the preliminary results of INFC2015 (third NFI), for which the estimated area of this category was approximately the same as in the previous photointerpretation.

Reclassification into FRA 2020 categories

None

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest	93.00	93.00	93.00	93.00	93.00
Temporarily unstocked and/or recently regenerated	99.00	76.00	54.00	54.00	54.00
Bamboos	0.00	0.00	0.00	0.00	0.00
Mangroves	0.00	0.00	0.00	0.00	0.00
Rubber wood	0.00	0.00	0.00	0.00	0.00

Comments

2.5 Comments

Category	Comments related to data definitions etc	Comments on reported trend
Primary forest	Italian primary forest is mainly located within the main protected areas managed by the State	The extent of Italian primary forest according with FRA definition is not well known. Anyway such extent was considered equal to forest cover in core areas of national parks. This data was considered unvaried for the whole reporting period
Other naturally regenerating forest	More than 90% of the Forest area belongs to this category. Seeding and planting are very rarely applied.	The increase of this category is linked to the general trend of forest area.

1d Annual forest expansion, deforestation and net change

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest; Other Wooded Land; Forest extent; Natural Regeneration	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011 (eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest; Other Wooded Land Forest extent; Natural Regeneration	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI2015
4	FAOSTAT	Total area; Inland water	1990 2000 2005	N/A
5	De Natale F. et al., 2003 Stima del grado di copertura forestale da ortofoto e applicazione della definizione di bosco negli Inventari Forestali. L'Italia Forestale e Montana n°4: 289-300.	Forest definitions comparability	2003	N/A
6	Administrative data from Regional Rural Development Programmes. Source Ministry of Agriculture/National Institute of Agricultural Economy	Afforestation	1994/2000 2001/2006 2007/2012	N/A

National classification and definitions

Category	Definition
Forest expansion	Expansion of forest on land that, until then, was not defined as forest.
...of which afforestation *(sub-category)*	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not defined as forest.
...of which natural expansion of forest *(sub-category)*	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).
Deforestation	The conversion of forest to other land use or the longterm reduction of the tree canopy cover below the minimum 10 percent threshold.
...of which human induced *(sub-category)*	Human induced conversion of forest to other land use or the permanent reduction of the tree canopy cover below the minimum 10 percent threshold.

Original data

Forest expansion, reforestation

Reference period	Afforestation	Natural regeneration
	ha	ha
1994/2000	104142	
2001/2006	54134	
2007/2015	61531	
1985		2700
2005		3000

Data on total afforestation refer to plantations made in the context of Rural Development Projects co-financed by the European Union; data on natural regeneration refer to high forests and come from NFI statistics.

Deforestation

On the basis of the NFI 2005 results and of the preliminary estimates of the ongoing NFI (2015) it has been possible to estimate the deforestation rate for the period (2005-2015). This in average is equal to 3695 hectares per year and has been reported in the table 1b as the 2010 value. This deforestation is deemed to human activities and therefore the same value has been repeated in the human induced cell.

Analysis and processing of national data

Estimation and forecasting

Forest expansion, reforestation

The extent of high forest natural regeneration is reported by NFI's 1985 and 2005. Being this phenomenon stable in time, 1985's data has been used for 1990. As concerns the remaining reporting years, 2005's data has been used.

Average annual rate of afforestation for the reporting periods has been calculated from the data reported in the table " **Forest expansion, reforestation"** (section original data) as follows:

- PERIOD 1990-2000
- Afforestation = annual afforestation reported for the period 1994/2000 (104 142/7/1000 = 14.88 Mha)
- PERIOD 2000-2010
- Afforestation = annual afforestation based on the sum of the total afforestation reported for the period 2001/2006 and 4/9 of the afforestation reported for the period 2007/2015 ((54 134+(61531/9)*4)/10/1000 = 8.15 Mha
- PERIOD 2010-2015
- Afforestation = annual afforestation reported for the period 2007/2015 (61531/9/1000 = 6.84 Mha)

Reclassification into FRA 2020 categories

Forest area

The findings of the first NFI (1985) have been reclassified according to FRA categories. While 2005 data were directly used being fully consistent with FRA definitions.

As a result of the reclassification **into FRA 2015**:

Data source	Forest (ha)	OWL (ha)
NFI1985	7200000	1475100
NFI2005	8759200	1708333
NFI2015	9297078	1813237

Forest expansion, reforestation None.

Preliminary estimates based on partial photo interpretation

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)			57.50	
…of which afforestation	14.88	8.15	6.84	
…of which natural expansion			50.65	
Deforestation (b)			3.69	
Forest area net change (a-b)	**77.95**	**65.88**	**53.81**	**53.81**

Comments

1e Annual reforestation

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest; Other Wooded Land; Forest extent; Natural Regeneration	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA- MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest; Other Wooded Land Forest extent; Natural Regeneration	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI2015
4	FAOSTAT	Total area; Inland water	1990 2000 2005	N/A
5	De Natale F. et al., 2003 Stima del grado di copertura forestale da ortofoto e applicazione della definizione di bosco negli Inventari Forestali. L'Italia Forestale e Montana n°4: 289-300.	Forest definitions comparability	2003	N/A
6	Administrative data from Regional Rural Development Programmes .Source Ministry of Agriculture/National Institute of Agricultural Economy	Afforestation	1994/2000 2001/2006 2007/2015	N/A

National classification and definitions

Category	Definition
Reforestation	Natural regeneration or re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.
...of which artificial reforestation *(subcategory)*	Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.

Original data

Categories	Annual forest establishment / loss (1000 hectares per year)				...of which of introduced species (1000 hectares per year)			
	1990	2000	2005	2010	1990	2000	2005	2010
Reforestation	7.1	6.3	6	5.7	4.4	3.3	3	2.7
... of which artificial	4.4	3.3	3	2.7	4.4	3.3	3	2.7

Analysis and processing of national data

Estimation and forecasting

Reforestation due to replanting of former poplar plantations (characterised by hybrids of introduced species) has been estimated by an expert respectively equal to 4 400, 3 300, 3 000 and 2 700 for the reporting periods into FRA2015.

Reclassification into FRA 2020 categories

Forest area

The findings of the first NFI (1985) have been reclassified according to FRA categories. While 2005 data were directly used being fully consistent with FRA definitions.

As a result of the reclassification **into FRA 2015**:

Data source	Forest (ha)	OWL (ha)
NFI1985	7200000	1475100
NFI2005	8759200	1708333
NFI2015	9297078	1813237

Forest expansion, reforestation None.

Preliminary estimates based on partial photo interpretation

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	6.70	6.00	5.70	

Comments

Reforestation for the reporting periods has been calculated as average of the figures reported in the original data; it includes natural regeneration of high forest and replanting of former poplar plantations. Natural regeneration of forest under coppice management is not included in the estimation. Estimates for the last reporting period not available.

1f Other land with tree cover

National Data

Data sources + type of data source eg NFI, etc

Trees in urban setting:

data at 2010 were retrieved from "Sallustio, L., Perone, A., Vizzarri, M., Corona, P., Fares, S., Cocozza, C., Tognetti, R., Lasserre, B., Marchetti, M., 2017. The green side of the grey: Assessing greenspaces in built-up areas of Italy. Urban For. Urban Green. 0–1. doi:10.1016/j.ufug.2017.10.018", using an estimation approach based on the use of the Italian Land Use Inventory (IUTI).

Tree Orchards:

Data were desumed by the Italian Land Use Inventory (IUTI) using the approach reported by "Pagliarella, M.C.C., Sallustio, L., Capobianco, G., Conte, E., Corona, P., Fattorini, L., Marchetti, M., 2016. From one- to two-phase sampling to reduce costs of remote sensing-based estimation of land-cover and land-use proportions and their changes. Remote Sens. Environ. 184, 410–417. doi:10.1016/j.rse.2016.07.027"

National classification and definitions

Trees in urban setting: Other land with tree cover such as: urban parks, alleys and gardens.

Tree Orchards: Other land with tree cover predominantly composed of trees for production of fruits, nuts, or olives.

Original data

Data from photointerpretation are available at 1990, 2000, 2008 and 2016

Analysis and processing of national data

Estimation and forecasting

Trees in urban setting:

Data for 1990, 2000, 2005, 2015 and 2020 were estimated assuming that the presence of trees in urban setting remained stable through time in relation to the increasing urban coverage.

The urban coverage from IUTI is 1,676,268 ha (1990), 1,765,826 ha (2000), 2,092,314 ha (2008), 2,258,288 ha (2016)

A simple linear interpolation was performed between the 2008 and 2016 data. The annual trend was applied to urban coverage in 2008 in order to retrieve urban coverage in 2010 and 2015 and to estimate it in 2020

the ratio between trees in urban setting and urban coverage was calculated for 2010 as 6.7% and assumed to be a costant over the reported years.

Tree Orchards:

Data from photointerpretation are available at 1990 (2,527,634 ha), 2000 (2,628,629 ha) 2008 (2,910,610 ha), 2016 (2,777,918 ha). Assuming as costant the 2008-2016 trend, the 2010 and 2015 data were retrieved and projection to 2020 were performed.

Reclassification into FRA 2020 categories

Corona P, Barbati A, Tomao A, Bertani R, Valentini R, Marchetti M, Fattorini L, Perugini L, 2012. Land use inventory as framework for environmental accounting: an application in Italy. iForest 5: 204-209 [online 2012-08-12] URL: http://www.sisef.it/iforest/contents? id=ifor0625-005

FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)	0.00	0.00	0.00	0.00	0.00
Tree orchards (b)	2 527.63	2 628.63	2 877.44	2 794.50	2 711.57
Agroforestry (c)	0.00	0.00	0.00	0.00	0.00
Trees in urban settings (d)	109.98	115.86	140.00	146.81	153.61
Other (specify in comments) (e)	0.00	0.00	0.00	0.00	0.00
Total (a+b+c+d+e)	**2 637.61**	**2 744.49**	**3 017.44**	**2 941.31**	**2 865.18**
Other land area	**20 290.92**	**19 394.97**	**18 625.34**	**18 303.68**	**17 982.03**

Comments

2 Forest growing stock, biomass and carbon

2a Growing stock

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste-ISAFA, 1988 Inventario Forestale Nazionale Sintesi metodologica e risultati.	Growing stock; Growing stock by tree species	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011 (eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Growing stock; Growing stock by tree species	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey).	Forest area	2015	Hereinafter NFI2015
4	Tabacchi G., Di Cosmo L., Gasparini P., 2011 - Aboveground tree volume and phytomass prediction equations for forest species in Italy. European Journal of Forest Research, 130, 6:911-934	Tree volume estimates	2005	N/A
5	Tabacchi G., Di Cosmo L., Gasparini P., Morelli S., 2011 - Stima del volume e della fitomassa delle principali specie forestali italiane. Equazioni di previsione, tavole del volume e tavole della fitomassa arborea epigea. CRA-MPF Trento, ISBN 978-88-97081-11- 1, 412 pp.	Tree volume estimates	2005	N/A
6	Fattorini L. et al., 2004 – Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino – Studi Trento, Sci.Nat., Acta Biol., 81 (2004)	Growing stock of Other wooded land	2005	N/A

National classification and definitions

National class	Definition
Growing stock NFI2005	Volume over bark of all living trees with a minimum diameter of 4,5 cm at breast height; volume is estimated above stumps; it includes branches and stem top up to the diameter of 5 cm.

Original data

Original NFI data after recalculation to apply the dbh threshold 10 cm; just the data useful for table 2a are shown

NFI1985 Forest classes with original growing stock data	Total GS (m^3) dbh >10 cm	Area (ha)	Volume/ha (m3/ha) dbh>10 cm
High Forest	400.002.554	2.478.442	161,4
Coppice	297.418.711	3.901.658	76,2
Plantations	10.201.412	134.100	76,1
Particular woody ecosystems - riparian and rupicolous stands	41.009.996	685.800	59,8
Total Forest GS	748.632.673	7.200.000	104,0

NFI2005 Forest classes with original growing stock data	Area (ha)	Volume/ha (m3/ha) dbh>10 cm	Total volume (m3) dbh>10 cm
Total	10.467.533	n.a.	n.a.
Forest	8.759.200	134,0	1.174.061.038

...of which plantations	122.252	96,8	11.836.438
Other wooded Land	1.708.333	n.a.	n.a.

The table below provides the GS data series, as reconstructed from the original data for the report FRA2015

FRA 2015 category	**Growing stock volume (million m3 over bark)**				
	Forest				
	1990	**2000**	**2005**	**2010**	**2015**
Total growing stock	855	1068	1.174	1.279	1.385
... of which coniferous	318	409	454	499	543
... of which broadleaved	537	659	720	781	841

Analysis and processing of national data

Estimation and forecasting

As the definition of GS and forest categories changed between the two NFIs, their data were made consistent through a recalculation of NFI1985 values. Details of this process are described in depth in FRA2010 and 2015 reports. Additionally, NFI1985 and NFI2005 data were processed again to apply the new dbh threshold (10 cm) for the FRA2015 reporting (see FRA2015 report for Italy for details). For the purpose of the present report, GS data on plantations were extracted from original data and harmonized according to the dbh threshold 10 cm. As GS data divided by naturally regenerating - planted forests are not available in the official NFI estimates, they were derived by applying the proportion between naturally regenerating and planted forests observed for area estimates, to the total GS estimate. This procedure is not fully consistent, as the proportions between GS values are different than the proportion between area estimates, but no other feasible procedures esist to derive these figures from past data. Additionally the GS values for the year 2015 were extrapolated from the data series between 1985 and 2005, as the third NFI is still ongoing and the new GS data are not yet available. For these reasons, for the years 2016-2020 the values of the year 2015 have been repeated.

Reclassification into FRA 2020 categories

NFI1985 categories	FRA categories				
	Naturally regenerating forest	Planted forest		Forest	Other wooded land
		…of which plantation forest	…of which other planted forest		
High Forest	84		16	100	
Coppice	100			100	
Plantations		100		100	
Particular woody ecosystems - riparian and rupicolous stands	100			100	

NFI2005 categories	FRA categories				
	Naturally regenerating forest	Planted forest		Forest	Other wooded land
		…of which plantation forest	…of which other planted forest		
Forest excluding plantations	95		5	100	
Plantations		100		100	

FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	109.70	126.80	142.90	150.40	150.40	150.40	150.40	150.40	150.40
Planted forest	134.30	122.20	122.60	129.00	129.00	129.00	129.00	129.00	129.00
…of which plantation forest	81.30	91.60	103.60	110.40	110.40	110.40	110.40	110.40	110.40
…of which other planted forest	151.90	131.30	127.30	133.60	133.60	133.60	133.60	133.60	133.60
Forest	111.50	126.50	141.50	148.90	148.90	148.90	148.90	148.90	148.90
Other wooded land									

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest	774.59	985.71	1 199.47	1 302.08	1 310.01	1 317.94	1 325.87	1 333.80	1 341.73
Planted forest	71.01	72.77	77.76	82.51	82.65	82.79	82.93	83.07	83.20
…of which plantation forest	10.66	11.49	12.90	13.96	14.00	14.04	14.08	14.13	14.17
…of which other planted forest	60.40	61.72	64.89	68.56	68.66	68.75	68.84	68.93	69.02
Forest	846.26	1 058.71	1 277.47	1 384.34	1 392.35	1 400.36	1 408.37	1 416.38	1 424.40
Other wooded land									

Comments

Below the total growing stock data calculated from the italian raw surface values. The differences are due to the estimation of the surface data from percentage entered in section 1.Total growing stock data for the years 2016-2020 were calculated by multiplying the area estimates of table 1b (obtained through extrapolation of provisional estimates of the forest area for the year 2015) by the growing stock per hectare estimated for each class in the year 2015; the latter was considered constant through the period, as new NFI data are still not available.

FRA categories	Total growing stock (million m³ over bark)			
	1990	2000	2010	2015
Naturally regenerating forest	781.851482	996.692740	1203.147039	1302.180708
Planted forest	73.138283	71.011206	76.221638	82.495608
…of which plantation forest	10.610169	11.427682	12.898110	13.959782
…of which other planted forest	62.528114	59.583525	63.323528	68.535827
Forest	854.989765	1067.703947	1279.368677	1384.676316

Other wooded land				

2b Growing stock composition

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste-ISAFA, 1988 Inventario Forestale Nazionale Sintesi metodologica e risultati.	Growing stock; Growing stock by tree species	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011 (eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/inventarioforestale/jsp/ home.jsp	Growing stock; Growing stock by tree species	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey).	Forest area	2015	Hereinafter NFI2015
4	Tabacchi G., Di Cosmo L., Gasparini P., 2011 - Aboveground tree volume and phytomass prediction equations for forest species in Italy. European Journal of Forest Research, 130, 6:911-934	Tree volume estimates	2005	N/A
5	Tabacchi G., Di Cosmo L., Gasparini P., Morelli S., 2011 - Stima del volume e della fitomassa delle principali specie forestali italiane. Equazioni di previsione, tavole del volume e tavole della fitomassa arborea epigea. CRA-MPF Trento, ISBN 978-88-97081-11- 1, 412 pp.	Tree volume estimates	2005	N/A
6	Fattorini L. et al., 2004 – Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino – Studi Trento, Sci.Nat., Acta Biol., 81 (2004)	Growing stock of Other wooded land	2005	N/A

National classification and definitions

National class	Definition
Growing stock NFI2005	Volume over bark of all living trees with a minimum diameter of 4,5 cm at breast height; volume is estimated above stumps; it includes branches and stem top up to the diameter of 5 cm.

Original data

As original data, figures reported for FRA2015-Table 3b are given

Category/Species name			Growing stock in forest (million cubic meters)			
Rank	Scientific name	Common name	1990	2000	2005	2010
1 st	Fagus sylvatica	Beech	148.5	187.6	207.1	225.8
2 nd	Picea abies	Norway spruce	138.5	179.9	200.6	218.8
3 rd	Castanea sativa	Chestnut	96.8	113.7	122.1	133.1
4 th	Quercus cerris	Turkey oak	57.7	74.7	83.1	90.7
5 th	Larix decidua	Larch	56.5	72.2	80	87.2
6 th	Quercus pubescens	Downy Oak	N/A	N/A	63.6	69.3
7 th	Ostrya carpinifolia	Hop-hornbeam	N/A	N/A	32.1	35
8 th	Quercus ilex	Holm oak	N/A	N/A	26.1	28.5
9 th	Abies alba	Silver fir	25.9	31.3	33.9	37
10 th	Pinus nigra	Black pine	N/A	N/A	29.7	32.4
Remaining			331.5	408.7	295.7	322

TOTAL			855.40	1068.10	1174.00	1279.80

Analysis and processing of national data

Estimation and forecasting

As the definition of GS changed between the two NFIs, their data were made consistent through a recalculation of NFI1985 values. Details of this process are described in depth in FRA2010 and 2015 reports. Additionally, NFI1985 and NFI2005 GS data were processed again to apply the new dbh threshold (10 cm) for the FRA2015 reporting (see FRA2015 report for Italy for details). NFI1985 provided the GS just for the few main species, while NFI2005 provided estimates of the first 45 species, ranked by decreasing volume. Figures for the FRA's reporting years were derived by interpolation between 1985 and 2005; the total GS extrapolated for the year 2010 was divided among the main species by applying the proportion of species observed in the NFI2005. Extrapolation of the distribution of GS by species to the following reporting years was considered not feasible. The rank of the species by volume in the FRA tables is the one observed in NFI2005. As regards introduced species, the data provided by NFI2005 were extrapolated to the years 2000 and 2010. For the year 1990 just GS data on native species was abailable; as a consequence, GS for introduced species is conventionally set to 0.00 for the year 1990. Additionally, as estimates on the total GS by the division native-introduced tree species is not available in the original NFI2005 data, to calculate the total GS of introduced species we assumed that the requested data "GS of other introduced tree species" is equal to 0.00, as they are very rare in Italy; the total GS of native species was calculated as the difference between the total GS and the total GS of introduced species. Finally, as comprehensive field data on GS composition are available just for the year 2005 (NFI2005), and they were used to calculate the composition for the years 2000 and 2010, we decided not to extrapolate further these estimates for after 2010.

Reclassification into FRA 2020 categories

None

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#1 Ranked in terms of volume	Fagus sylvatica	Beech	148.46	187.56	225.82		
#2 Ranked in terms of volume	Picea abies	Norway spruce	138.54	179.94	218.81		
#3 Ranked in terms of volume	Castanea sativa	Chestnut	96.78	113.66	133.11		
#4 Ranked in terms of volume	Quercus cerris	Turkey oak	57.67	74.65	90.67		
#5 Ranked in terms of volume	Larix decidua	Larch	56.49	72.15	87.23		
#6 Ranked in terms of volume	Quercus pubescens	Downy Oak			69.32		
#7 Ranked in terms of volume	Ostrya carpinifolia	Hop-hornbeam			34.96		
#8 Ranked in terms of volume	Quercus ilex	Holm oak			28.52		
#9 Ranked in terms of volume	Abies alba	Silver fir	25.92	31.27	37.01		
#10 Ranked in terms of volume	Pinus nigra	Black pine			32.44		
Remaining native tree species			322.39	364.50	279.70		
Total volume of native tree species			**846.25**	**1 023.73**	**1 237.59**	–	–
Introduced tree species							
#1 Ranked in terms of volume	Robinia pseudoacacia	Black locust		16.91	20.27		
#2 Ranked in terms of volume	Populus hybridae	Hybrid poplars		6.58	7.17		
#3 Ranked in terms of volume	Pseudotsuga menziesii	Douglas fir		5.45	5.95		

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#4 Ranked in terms of volume	Eucalyptus spp	Eucalyptus (many species)		4.42	4.82		
#5 Ranked in terms of volume	Pinus radiata	Monterey pine		1.62	1.77		
Remaining introduced tree species				0.00	0.00		
Total volume of introduced tree species			–	**34.98**	**39.98**	–	–
Total growing stock			**846.25**	**1 058.71**	**1 277.57**	–	–

Comments

As estimates on the total GS by the division native-introduced tree species are not available in the original data, the requested data on "GS of other native tree species" and "GS of other introduced tree species" cannot be provided. That's why here the Total Growing Stock values aren't equal to Total Growing Stock of 2a table.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste-ISAFA, 1988 Inventario Forestale Nazionale Sintesi metodologica e risultati.	Growing stock; Growing stock by tree species	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011 (eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/home.jsp	Growing stock; Growing stock by tree species	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey).	Forest area	2015	Hereinafter NFI2015
4	Tabacchi G., Di Cosmo L., Gasparini P., 2011 - Aboveground tree volume and phytomass prediction equations for forest species in Italy. European Journal of Forest Research, 130, 6:911-934	Tree volume estimates	2005	N/A
5	Tabacchi G., Di Cosmo L., Gasparini P., Morelli S., 2011 - Stima del volume e della fitomassa delle principali specie forestali italiane. Equazioni di previsione, tavole del volume e tavole della fitomassa arborea epigea. CRA-MPF Trento, ISBN 978-88-97081-11- 1, 412 pp.	Tree volume estimates	2005	N/A
6	Fattorini L. et al., 2004 – Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino – Studi Trento, Sci.Nat., Acta Biol., 81 (2004)	Growing stock of Other wooded land	2005	N/A
7	Gasparini P., Di Cosmo L., Pompei E. (eds) 2013 - Il contenuto di carbonio delle foreste italiane. Inventario Nazionale delle Foreste e dei serbatoi forestali di Carbonio INFC 2005. Metodi e risultati dell'indagine integrativa. Ministero delle Politiche Agricole, Alimentari e Forestali, Corpo Forestale dello Stato; Consiglio per la Ricerca e la Sperimentazione in Agricoltura, Unità di ricerca per il Monitoraggio e la Pianificazione Forestale. Trento, 260 pp. (Phase 3+ of NFI2005)	Dead wood Litter Carbon Soil Carbon	2005	Hereinafter NFI2005 additional survey

National classification and definitions

National class	Definition			
Above-ground biomass	Consistent with FRA one			
Below-ground biomass	Consistent with FRA one			
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, stumps larger than or equal to 10 cm in diameter and standing trees with DBH > 4,5 cm.			

Original data

The table below provides the GS biomass data series, as reconstructed from the original data for the report FRA2015.

Table 3d

Category	Biomass (million metric tonnes oven-dry weight)									
	Forest					Other wooded land				
	1990	2000	2005	2010	2015	1990	2000	**2005**	**2010**	**2015**

Above ground biomass	641	797	874	951	1028	N/A	N/A	N/A	N/A	N/A
Below ground biomass	158	196	215	235	254	N/A	N/A	N/A	N/A	N/A
Dead wood	36	45	50	54	58	N/A	N/A	N/A	N/A	N/A
TOTAL	835	1038	1139	1240	1340	N/A	N/A	N/A	N/A	N/A

Analysis and processing of national data

Estimation and forecasting

As the definition of GS and forest categories changed between the two NFIs, their data were made consistent through a recalculation of NFI1985 values. Details of this process are described in depth in FRA2010 and 2015 reports. Additionally, NFI1985 and NFI2005 data were processed again to apply the new dbh threshold (10 cm) for the FRA2015 reporting (see FRA2015 report for Italy for details). The GS values for the year 2015 were extrapolated from the data series between 1985 and 2005, as the third NFI is still ongoing and the new GS data are not yet available. For these reasons, we did not extrapolated further the GS values to the years 2016-20. The above-ground biomass estimation in NFI2005 was based on a new set of 25 national models, constructed on the basis of about 1300 sample trees collected between 2002 and 2005, to derive above-ground phytomass from diameter at breast height and total tree height. Therefore, NFI2005 data is highly reliable and based on measured variables. This data has also been used to build up two conversion factors to estimate 1985 biomass starting from Growing Stock original data. Below-ground biomass is based on IPCC conversion factors applied to above-ground biomass data. Deadwood biomass is based on measured deadwood volume and dry weight. Other reporting years have been assessed on the assumption that the ratio betwwen dead wood and above-ground biomass is constant in time. Data on carbon content are obtained by applying the carbon fraction suggested by IPCC2003. Estimates of the carbon content of forest litter and soil were provided by NFI2005 additional survey.

Reclassification into FRA 2020 categories

None

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	84.50	95.20	105.30	110.60	110.60	110.60	110.60	110.60	110.60
Below-ground biomass	20.80	23.40	26.00	27.30	27.30	27.30	27.30	27.30	27.30
Dead wood	4.70	5.40	6.00	6.20	6.20	6.20	6.20	6.20	6.20

Comments

For the years 2016-2020 the values of the year 2015 have been repeated, as the estimates of the new ongoing inventory are still not available

2d Carbon stock

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste-ISAFA, 1988 Inventario Forestale Nazionale Sintesi metodologica e risultati.	Growing stock; Growing stock by tree species	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011 (eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/home.jsp	Growing stock; Growing stock by tree species	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey).	Forest area	2015	Hereinafter NFI2015
4	Tabacchi G., Di Cosmo L., Gasparini P., 2011 - Aboveground tree volume and phytomass prediction equations for forest species in Italy. European Journal of Forest Research, 130, 6:911-934	Tree volume estimates	2005	N/A
5	Tabacchi G., Di Cosmo L., Gasparini P., Morelli S., 2011 - Stima del volume e della fitomassa delle principali specie forestali italiane. Equazioni di previsione, tavole del volume e tavole della fitomassa arborea epigea. CRA-MPF Trento, ISBN 978-88-97081-11- 1, 412 pp.	Tree volume estimates	2005	N/A
6	Fattorini L. et al., 2004 – Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino – Studi Trento, Sci.Nat., Acta Biol., 81 (2004)	Growing stock of Other wooded land	2005	N/A
7	Gasparini P., Di Cosmo L., Pompei E. (eds) 2013 - Il contenuto di carbonio delle foreste italiane. Inventario Nazionale delle Foreste e dei serbatoi forestali di Carbonio INFC 2005. Metodi e risultati dell'indagine integrativa. Ministero delle Politiche Agricole, Alimentari e Forestali, Corpo Forestale dello Stato; Consiglio per la Ricerca e la Sperimentazione in Agricoltura, Unità di ricerca per il Monitoraggio e la Pianificazione Forestale. Trento, 260 pp. (Phase 3+ of NFI2005)	Dead wood Litter Carbon Soil Carbon	2005	Hereinafter NFI2005 additional survey

National classification and definitions

National class	Definition
Above-ground biomass	Consistent with FRA one
Below-ground biomass	Consistent with FRA one
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, stumps larger than or equal to 10 cm in diameter and standing trees with DBH > 4,5 cm.

Original data

The table below provides the carbon data series, as reconstructed from the original data for the report FRA2015

Table 3e

Category	Carbon (Million metric tonnes)									
	Forest					Other wooded land				
	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015

Carbon in above ground biomass	321	398	437	476	514	N/A	N/A	N/A	N/A	N/A
Carbon in below ground biomass	79	98	108	117	127	N/A	N/A	N/A	N/A	N/A
Subtotal Living biomass	400	496	545	593	641	N/A	N/A	N/A	N/A	N/A
Carbon in dead wood	18	23	25	27	29	N/A	N/A	N/A	N/A	N/A
Carbon in litter	24	27	28	29	30	N/A	N/A	N/A	N/A	N/A
Subtotal Dead wood and litter	42	50	53	56	59	N/A	N/A	N/A	N/A	N/A
Soil carbon	620	684	716	738	760	N/A	N/A	N/A	N/A	N/A
TOTAL	1062.00	1230.00	1314.00	1387.00	1460.00	.00	.00	.00	.00	.00

Analysis and processing of national data

Estimation and forecasting

As the definition of GS and forest categories changed between the two NFIs, their data were made consistent through a recalculation of NFI1985 values. Details of this process are described in depth in FRA2010 and 2015 reports. Additionally, NFI1985 and NFI2005 data were processed again to apply the new dbh threshold (10 cm) for the FRA2015 reporting (see FRA2015 report for Italy for details). The GS values for the year 2015 were extrapolated from the data series between 1985 and 2005, as the third NFI is still ongoing and the new GS data are not yet available. For these reasons, we did not extrapolated further the GS values to the years 2016-20. The above-ground biomass estimation in NFI2005 was based on a new set of 25 national models, constructed on the basis of about 1300 sample trees collected between 2002 and 2005, to derive above-ground phytomass from diameter at breast height and total tree height. Therefore, NFI2005 data is highly reliable and based on measured variables. This data has also been used to build up two conversion factors to estimate 1985 biomass starting from Growing Stock original data. Below-ground biomass is based on IPCC conversion factors applied to above-ground biomass data. Deadwood biomass is based on measured deadwood volume and dry weight. Other reporting years have been assessed on the assumption that the ratio betwwen dead wood and above-ground biomass is constant in time. Data on carbon content are obtained by applying the carbon fraction suggested by IPCC2003. Estimates of the carbon content of forest litter and soil were provided by NFI2005 additional survey.

Reclassification into FRA 2020 categories

None

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	42.30	47.60	52.70	55.30	55.30	55.30	55.30	55.30	55.30
Carbon in below-ground biomass	10.40	11.70	13.00	13.70	13.70	13.70	13.70	13.70	13.70
Carbon in dead wood	2.40	2.70	3.00	3.10	3.10	3.10	3.10	3.10	3.10
Carbon in litter	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
Soil carbon	81.70	81.70	81.70	81.70	81.70	81.70	81.70	81.70	81.70

Soil depth (cm) used for soil carbon estimates	30.00

Comments

For the years 2016-2020 the values of the year 2015 have been repeated, as the estimates of the new ongoing inventory are still not available

3 Forest designation and management

3a Designated management objective

National Data

Data sources + type of data source eg NFI, etc

4.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest area; forest functions; forest area legally bound for hydro-geological purposes	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005). MiPAAF-CFS, CRA-MPF. Edagricole, Milano. http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest area; forest functions; forest area legally bound for hydro-geological purposes	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI2015
4	Ministero dell'Ambiente e della Tutela del Territorio. Data base	Protected areas:-Official National list;-RAMSAR sites;-Natura 2000 network's Special; Protection areas (SPAs) and Sites of Community Importance (SCI)	1993 2000 2003 2005 2008	Ministry of Environment's ad hoc elaboration
5	European Environment Agency – Corine Land Cover	Corine Land Cover Level 3	1990 2000	N/A

National classification and definitions

Term	Definition
Primary function	The primary function or management objective assigned to a management unit either by legal prescription documented decision of the landowner/manager or evidence provided by documented studies of forest management practices and customary use.
Production forest	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Multiple use forest	Forest area designated for more than one purpose and where none of these alone is considered as the predominant designated function.
Specialized stands	Managed using specific sylvicultural practices for NWFP; mainly chestnut and cork oak stands
Forest designated for protection of soil and water	Forest area legally bound for hydro-geological purposes as defined by the national law n. 3267/1923
Conservation of biodiversity	As no significant new protected area has been established in the last reporting period, data for this category (coincident with Forest area within protected areas) has not changed from 2009.
Forests with special restrictions	Forests where the management objective is defined by special restrictions (for the presence of military areas, roads, railways, airports, etc.)

Original data

NFI1985 - Primary function of forests	
Primary function	**Forest**
Wood production	4 187 338

Non wood production	135 747
Touristic-recreational	14 655
Rest of the Forest Area	*2 862 260*
Total	7 200 000

NFI1985 - Area of plantations and specialized stands (ha)	
Plantations and specialised stands	**288 900**
high stand plantations for wood production with more than 5 m of height	**117 000**
of which coniferous	3 600
of which broadleaved – Poplars	106 200
of which broadleaved – Other broadleaves	7 200
High stand plantations with an average height less than 5 m	**13 500**
of which coniferous	4 500
of which broadleaved – Poplars	4 500
of which broadleaved – Other broadleaves	4 500
Other broadleaves coppice plantations	**2 700**
Eucalyptus coppice plantations	**900**
Total plantations	**134 100**
Chestnut stands for fruit production	90 000
Cork oak stands	64 800
Total specialized stands for NWFP	**154 800**

NFI2005 - Area by management type and intensity (ha)	
Ordinary silvicultural practices	5 443 442
Specific sylvicultural practices, for NWFP	189 240
Plantation forests for wood production	122 252

CORINE Land Cover	**Years**	
	2005	**2008**
Classes	**ha**	**ha**
Broadleaved forests	1 737 764	1 812 659
Coniferous forests	423 990	470 937
Mixed forests	284 998	305 321
Sclerophyllous vegetation	271 875	305 635
Transitional woodland/shrub	340 311	366 560

Burned areas	3 717	3 759
Total	3 062 655	3 264 871

From FRA2015 Tables					
Categories	**Forest area (1000 hectares)**				
	1990	**2000**	**2005**	**2010**	**2015**
Protection of soil and water (table 5a)	6973	7427	7654	7889	8124
Forest area within protected areas (Table 6a)	645	2874	3062	3265	3265
…of which forests in strictly protected areas (core areas of national parks) (Table 2a - Primary forest)	93.00	93.00	93.00	93.00	93.00

Analysis and processing of national data

Estimation and forecasting

Data on the management objective "Production" for intermediate reporting years have been obtained by means of linear interpolation of 1985 and 2005.

Data on forest area legally bound for hydro-geological purposes for the years 1990 and 2000 were obtained by linear interpolation between 1985 and 2005; values for the years 2010 and 2015 were obtained by applying the proportion of legally bound forest area reported for 2005 to the estimates of forest area for the same reporting years.

To obtain the information on “Conservation of Biodiversity”, Corine LC 2000 (level 3) layer has been intersected with all Italian protected areas boundaries referring to 2008 (resulting from the National Official List + Ramsar sites + Natura 2000 network’s Special Protection areas and Sites of Community Importance). As no new protected area has been established from 2009 onwards, this value has been repeated for 2010 and 2015.

Reclassification into FRA 2020 categories

None

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)	294.55	305.84	317.14	322.79	328.44
Protection of soil and water (b)					
Conservation of biodiversity (c)	93.00	93.00	93.00	93.00	93.00
Social Services (d)					
Multiple use (e)					
Other (specify in comments) (f)					
None/unknown (g)	**7 202.20**	**7 970.41**	**8 617.90**	**8 881.29**	**9 144.69**
Total forest area	**7 589.75**	**8 369.25**	**9 028.04**	**9 297.08**	**9 566.13**

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production	4 650.48	5 305.28	5 960.08	6 287.48	6 614.88
Protection of soil and water	6 973.00	7 427.00	7 889.00	8 124.00	8 369.00
Conservation of biodiversity	645.00	2 874.00	3 265.00	3 265.00	3 265.00
Social Services					
Other (specify in comments)		27.80	27.80		

Comments

The class "Other" includes forests with special restrictions, as those located in military camps or close to highways, airports, power lines etc.

3b Forest area within protected areas and forest area with long-term management plans

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA, 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest area; forest area with management plan	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005).MiPAAF-CFS, CRA-MPF. Edagricole, Milano.http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest area; forest area with management plan	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015	Forest area: provisional results of photointerpretation (first phase of the NFI survey)	2015	Hereinafter NFI2015
4	Ministero dell'Ambiente e della Tutela del Territorio Data base.	Protected areas:-Official National list;-RAMSAR sites;-Natura 2000 network's Special; Protection areas (SPAs) and Sites of Community Importance (SCI)	1993-2000-2003-2005-2008	Ministry of Environment's ad hoc elaboration
5	European Environment Agency – Corine Land Cover	Corine Land Cover Level 3	1990-2000	N/A

National classification and definitions

Category	Definition
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area with management plan	Forest area that has a long-term documented management plan, aiming at defined management goals which is periodically revised

Original data

CORINE Land Cover	Years	
	2005	2008
Classes	ha	ha
Broadleaved forests	1 737 764	1 812 659
Coniferous forests	423 990	470 937
Mixed forests	284 998	305 321
Sclerophyllous vegetation	271 875	305 635
Transitional woodland/shrub	340 311	366 560
Burned areas	3 717	3 759

Total forests in protected areas	3 062 655	3 264 871

FRA2015 Table 6

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Forest area within protected areas	645	2874	3062	3265	3265

FRA2015 Table 14a

Forest plan type	Forest area 2010 (000 ha)
Forest area with management plan	1578
... of which for production	N/A
... of which for conservation	N/A

Analysis and processing of national data

Estimation and forecasting

To obtain the information on “Forests within protected areas”, Corine LC 2000 (level 3) layer has been intersected with all Italian protected areas boundaries referring to 2008 (resulting from the National Official List + Ramsar sites + Natura 2000 network’s Special Protection areas and Sites of Community Importance). As no new protected area has been established from 2009 onwards, this value has been repeated for 2010 and 2015.

Information on forests under management plan is available just for NFI2005. The proportion of forest under management plan reporte by NFI2005 was used to calculate the related figure for the year 2010. The extrapolation of this proportion to the following years was considered not feasible. The extent of forest under management plan within protected areas is not known.

The area of forest under sustainable management and the area of permanent forest estate have been estimated taking into account the Italian legal framework summarised in the following box.

Italian Forest Resources are 100% legally bound. The two main bindings provided by the laws n. 3267 of 1923 and n. 431 of 1985 compel private and public owners to strictly respect limitations concerning the use of their forest resources. As a matter of fact, each exploitation of forest resources must not compromise their perpetuation and therefore, any change of land use; this for the sake of hydro-geological, landscape and environmental protection in general (the same limitations apply also to burnt forest and OWL, due to the law n. 353 on forest fires approved in 2000). As a consequence not only unplanned cuttings are always forbidden, but local prescriptions fix precise sylvicultural rules to be observed. Only exception made for productive forestry plantations, such as poplar stands, usually located on plains and managed according to intensive sylvicultural techniques. As a consequence the whole forest area except for the area of the above mentioned plantations is intended to be in permanent forest land use and corresponds also to the permanent forest estate area.

Reclassification into FRA 2020 categories

None

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	645.00	2 874.00	3 265.00	3 265.00	3 265.00	3 265.00	3 265.00	3 265.00	3 265.00
Forest area with long-term forest management plan			1 578.00						
…of which in protected areas									

Comments

4 Forest ownership and management rights

4a Forest ownership

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA, 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest area; forest functions; forest area by private/public ownership	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005).MiPAAF-CFS, CRA-MPF. Edagricole, Milano.http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest area; forest functions; forest area by private/public ownership and by type of owner	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015,	Forest area: provisional results of photointerpretation (first phase of the NFI survey)	2015	Hereinafter NFI2015
4	ISTAT. http://www.istat.it/Imprese/Agricoltur/index.htm	Forest ownership	2000	
5	ISTAT. 1993. Statistiche Forestali. Annuario n.43, edizione 1993.	Forest ownership	1993	

National classification and definitions

Term	Definition
Public ownership	Coinciding with the FRA2020 definition
Private ownership	Coinciding with the FRA2020 definition
...of which owned by individuals	Coinciding with the FRA2020 definition
...of which owned by private business entities and institutions	Coinciding with the FRA2020 definition

Original data

NFI2005 (1000 ha)		
Public ownership	2 942	
Private ownership	5 817	
...of which owned by individuals	5 126	
...of which owned by private business entities and institutions	691	
TOTAL	**8 759**	
ISTAT data for 1990 and 2000		
Year	**Public Forest (ha)**	**Private Forest (ha)**
1990	2 933 995	5 448 848

2000	3 306 382	6 140 424

Analysis and processing of national data

Estimation and forecasting

Data available at the Statistical National Institute (ISTAT) has been used as a control of the NFI2005 share of public/private ownership. This because the definition of Forest adopted by ISTAT is different from the FRA one and that this would lead to an evident underestimation of the total Forest extent. As reported in the following table, the share of ownership categories resulting from the analysis of the two data sets is very similar.

NFI 2005		ISTAT	
Private	Public	Private	Public
%	%	%	%
66	34	65	35

Thus the NFI 2005 percentage has been applied to the forest extent for the reporting years 1990, 2000 and 2010 to obtain the final data for table. As the provisional results of NFI2015 do not provide any updated information on the division of the forest area into ownership categories, data for the reporting year 2015 are not available.

Reclassification into FRA 2020 categories

None

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	5 041.00	5 558.00	5 996.00	
…of which owned by individuals	4 442.00	4 898.00	5 284.00	
…of which owned by private business entities and institutions	599.00	660.00	712.00	
…of which owned by local, tribal and indigenous communities				
Public ownership (b)	2 548.00	2 811.00	3 032.00	
Unknown/other (specify in comments) (c)	**0.75**	**0.25**	**0.04**	–
Total forest area	**7 589.75**	**8 369.25**	**9 028.04**	**9 297.08**

Comments

4b Holder of management rights of public forests

National Data

Data sources + type of data source eg NFI, etc

No data are availble at the national level

National classification and definitions

-

Original data

-

Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)				
Individuals (b)				
Private business entities and institutions (c)				
Local, tribal and indigenous communities (d)				
Unknown/other (specify in comments) (e)	**2 548.00**	**2 811.00**	**3 032.00**	–
Total public ownership	**2 548.00**	**2 811.00**	**3 032.00**	–

Comments

This section is left empty as no data are available at the national level.

5 Forest disturbances

5a Disturbances

National Data

Data sources + type of data source eg NFI, etc

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC) http://www.sian.it/inventarioforestale/jsp/home.jsp	H	Disturbances; Invasive species	2005	
Italian Focal Centre reports on defoliation to ICP	H	Defoliation	1998-2002 2003-2007	

National classification and definitions

National class	Definition
Disturbance by parasites	Disturbance caused by insect and diseases
Disturbance by wildlife browsing and grazing	Disturbance by other biotic agents
Disturbance by pollution	Disturbance caused by abiotic factors: mainly air pollution
Disturbance adverse climatic conditions	Disturbance caused by abiotic factors: mainly snow, storm and drought
Invasive species	Forest where the presence of *Robinia pseudoacacia* L. or *Ailanthus altissima* Miller is detected in terms of a minimum basal area of 2 square meters

Original data

There is no annual survey on disturbances referring to the whole Italian territory apart from the ICP level I (International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forest), which provides only defoliation data per number of trees according to four classes of damage. In Italy the ICP sampling vary from year to year implying approximately 250 plots and 7000 trees. This information, expressed in percent of damaged trees (of all species) out of total number of observed trees, has been used to adjust original 2005 NFI data retrieving missing forest area affected by disturbances for the years 1998-2007. ICP classes (2, 3 and 4) here considered as damaged include trees with a defoliation rate ranging from the 25 to the 100%.

Annual defoliation rates (Results of ICP survey)

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
35.9%	35.3%	34.4%	38.4%	37.3%	37.3%	35.9%	32.9%	30.5%	35.7%

NFI 2005 – affected Forest (ha)

Disturbance by insects	331 199
Disturbance by fungi	564 418
Disturbance by wildlife browsing and grazing	322 689
Disturbance by pollution	4 189
Disturbance adverse climatic conditions	553 669
Invasive species: *Robinia pseudoacacia* L	377 186
Invasive species: *Ailanthus altissima* Miller	7 142

Analysis and processing of national data

Estimation and forecasting

Estimation and forecasting

To estimate the requested extent of damaged forest the following steps have been made:

- The average rate of defoliation has been calculated for the period 2003/2007. Value is 34.5%;
- These values have been divided by 32.9%, which is the 2005 defoliation rate.
- The values obtained (104.7%) have then been multiplied by 2005 punctual original data per type of national classes of disturbances, in order to estimate the corresponding damaged average areas for the reporting periods mentioned above.

Any estimation for the period 1988/1992 is considered impossible.

As wildlife browsing and grazing are not directly affecting the defoliation rate, estimation of other disturbances caused by other biotic agents is only feasible for the year 2005, for which only the NFI original data is finally reported.

Reclassification into FRA 2020 categories

None

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insects (a)						346.90												
Diseases (b)						591.20												
Severe weather events (c)						584.30												
Other (specify in comments) (d)						322.70												
Total (a+b+c+d)	–	–	–	–	–	**1 845.10**	–	–	–	–	–	–	–	–	–	–	–	–
Total forest area	**8 369.25**	–	–	–	–	**8 759.00**	–	–	–	–	**9 028.04**	–	–	–	–	**9 297.08**	**9 350.89**	**9 404.70**

Comments

The figures for the reporting years refer to the averages of annually affected areas for the 5-year period 2003-2007.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

"Other" disturbances refer to disturbance by wildlife browsing and grazing.

5b Area affected by fire

National Data

Data sources + type of data source eg NFI, etc

Arma dei Carabinieri - C.U.F.A.

National classification and definitions

National class	Definition
Forest Fire	A fire starting in forest or shrubby land that might spread through neighbouring other land.

Original data

Year	Number of fires	Affected area (ha)		
		Forest or shrubby land	Other land	Total
1988	13 558	60 109	126 296	186 405
1989	9 669	45 933	49 228	95 161
1990	14 477	98 410	96 909	195 319
1991	11 965	30 172	69 688	99 860
1992	14 641	44 522	61 170	105 692
1998	9 540	73 017	82 536	155 553
1999	6 932	39 362	31 755	71 117
2000	8 595	58 234	56 414	114 648
2001	7 134	38 186	38 241	76 427
2002	4 601	20 218	20 573	40 791
2003	9 697	44 064	47 741	91 805
2004	6 428	20 866	39 310	60 176
2005	7 951	21 470	26 105	47 575
2006	5 643	16 422	23 524	39 946
2007	10 639	116 602	111 127	227 729
2008	6 486	30 273	36 055	66 328
2009	5 422	31 060	42 295	73 355
2010	4 884	19 357	27 180	46 537
2011	8 181	38 430	33 577	72 007
2012	8 274	74 532	56 267	130 799
2013	2.936	13.437	15.639	29.076
2014	3257	17320	18805	36.125

2015	5.442	25.867	15.644	41.511
2016	4.906	31.003	31.905	62.908
2017	7855	113566	48420	161986

Analysis and processing of national data

Estimation and forecasting

None

Reclassification into FRA 2020 categories

None

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total land area affected by fire	114.65	76.43	40.79	91.80	60.18	47.57	39.95	227.73	66.33	73.35	46.54	72.01	130.80	29.08	36.12	41.51	62.91	161.99
…of which on forest	58.23	38.19	20.57	44.06	20.87	21.47	16.42	116.60	30.27	31.06	19.37	38.43	74.53	13.44	17.32	25.87	31.00	113.57

Comments

5c Degraded forest

Does your country monitor area of degraded forest		No
If "yes"	What is the national definition of "Degraded forest"?	
	Describe the monitoring process and results	

Comments

Not applicable

6 Forest policy and legislation

6a Policies, Legislation and national platform for stakeholder participation in forest policy

National Data

Data sources + type of data source eg NFI, etc

Ministero delle Politiche Agricole Alimentari Forestali e del Turismo (www.politicheagricole.it)

Ministero dell'Ambiente della tutela del territorio e del Mare (www.minambiente.it)

National classification and definitions

None

Original data

None

Indicate the existence of	Boolean (Yes/No)	
	National	Sub-national
Policies supporting SFM	Yes	Yes
Legislations and regulations supporting SFM	Yes	Yes
Platform that promotes or allows for stakeholder participation in forest policy development	Yes	Yes
Traceability system(s) for wood products	Yes	Yes

Comments

The Italian national forest strategy, which will have a value for 10 years, is being updated

6b Area of permanent forest estate

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAFA, 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	Forest area; forest functions; forest area by private/public ownership	1985	Hereinafter NFI1985
2	Gasparini P. Tabacchi G., 2011(eds). L'Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio (INFC-2005).MiPAAF-CFS, CRA-MPF. Edagricole, Milano.http://www.sian.it/ inventarioforestale/jsp/ home.jsp	Forest area; forest functions; forest area by private/public ownership and by type of owner	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015,	Forest area: provisional results of photointerpretation (first phase of the NFI survey)	2015	Hereinafter NFI2015

National classification and definitions

Italian Forest Resources are 100% legally bound. The two main bindings provided by the laws n. 3267 of 1923 and n. 431 of 1985 oblige private and public owners to strictly respect limitations concerning the use of their forest resources. As a matter of fact, each exploitation of forest resources must not compromise their perpetuation and therefore, any change of land use; this for the sake of hydro-geological, landscape and environmental protection in general (the same limitations apply also to burnt forest and OWL, due to the law n. 353 on forest fires approved in 2000). As a consequence not only unplanned cuttings are always forbidden, but local prescriptions fix precise sylvicultural rules to be observed. Only exception made for productive forestry plantations, such as poplar stands, usually located on plains and managed according to intensive sylvicultural techniques.

As a consequence the whole forest area except for the area of the above mentioned plantations is intended to be in permanent forest land use and corresponds also to the permanent forest estate area.

Data on Forest area and Forest Plantations area for the reporting years derive from a linear interpolation of NFI 1985-2005-2015(provisional) estimates. The forest area of permanent forest estate derive from the subtraction of forest plantations area to the Forest area.

Original data

	NFI1985	NFI2005	NFI2015
Forest	7200	8 759.2	9 297.1
Plantations	134.1	122.3	126.5
Forest under premanent estate (Forest-Plantations)	7065.9	8 636.9	9 170.6

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	Yes	7 458.70	7 858.40	8 903.80	9 170.60	9 437.40

Comments

7 Employment, education and NWFP

7a Employment in forestry and logging

National Data

Data sources + type of data source eg NFI, etc

The Totals of Employment in forestry and logging in fte (3 year average) stem from

National Accounts - Italian National Statistical Institute (Istat) - http://dati.istat.it/

To fill in the 1990 Total the data referred to 1995 (first available data) has been used

Details for 3 digit NACE codes and the split between Male and Female stem from estimates and have to be considered as provisional.

National classification and definitions

None

Original data

http://dati.istat.it/

Details for 3 digit NACE codes and the split between Male and Female stem from estimates and have to be considered as provisional.

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging	36.10			30.03			36.73			39.87	3.35	36.52
…of which silviculture and other forestry activities										10.05	1.19	8.68
…of which logging										20.55	1.27	19.29
…of which gathering of non wood forest products										0.57	0.38	0.19
…of which support services to forestry										8.69	0.50	8.20

Comments

7b Graduation of students in forest-related education

National Data

Data sources + type of data source eg NFI, etc

Minister for Education - Survey: Indagine sull'Istruzione Universitaria

http://anagrafe.miur.it/index.php

National classification and definitions

Table reports on data relative to the following:

- Scienze e Tecnologie Agrarie e Forestali (Bachelor)

- Scienze e Tecnologie Agrarie Agroalimentari e Forestali (Bachelor)

- Specialistiche in Scienze e Gestione delle Risorse Rurali e Forestali (Master)

- Scienze e Tecnologie Forestali e Ambientali (Master)

To fill in 2010 and 2015 the average number of graduated in the academic years 2008/2009, 2009/2010 and 2010/2011 and 2013/2014, 2014/2015 and 2015/2016 have been used respectively

The first available data (relative to academic year 2005/2006) have been used to fill in 2000

Post-graduate studies degree (usually less then three years) different from Doctorate has not been considered

To fill in Technician certificate / diploma 2015 the number of students attending the last year of the following schools have been used (data refer to the school year 2015/2016 and have to be considered as provisional):

- GESTIONE RISORSE FORESTALI E MONTANE - OPZIONE
- SERVIZI PER L'AGRICOLTURA E LO SVILUPPO RURALE BIENNIO - TRIENNIO

Original data

http://anagrafe.miur.it/index.php

FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree				10.00	5.00	5.00	128.00	62.00	66.00	101.00	45.00	56.00
Master's degree				107.00	44.00	63.00	235.00	76.00	159.00	264.00	94.00	170.00
Bachelor's degree				2 032.00	788.00	1 244.00	2 319.00	787.00	1 532.00	2 114.00	656.00	1 458.00
Technician certificate / diploma										2 390.00	522.00	1 868.00
Total				2 149.00	837.00	1 312.00	2 672.00	925.00	1 757.00	4 869.00	1 317.00	3 552.00

Comments

7c Non wood forest products removals and value 2015

National Data

Data sources + type of data source eg NFI, etc

	References to sources of information	Variables	Years	Additional comments
4	ISTAT 2008	Commercial value of NWFP	2008	N/A

National classification and definitions

Term	Definition
Non wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Commercial value of NWFP	For the purpose of this table, value is defined as the commercial market value at the forest gate.

National class	Definition
Forest stands managed for non wood productions	Mainly Chestnut and Cork Oak stands

Original data

Area of forest designated for productive functions in 1985.

Categories	Year 1985
	ha
Plantations	134100
Coppice	3653800
Non wood production stands	135747

Source: NFI1985

Area of forest designated for productive and touristic functions in 2005.

Categories	Year 2005
	ha
Plantations	122252
Coppice	3663143
Non wood production stands	189240

Source: NFI2005

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	Chestnuts	Castanea sativa Miller			41 419	1 Food
#2	Hazelnuts	Corylus avellana L.			16 084	1 Food
#3	Mushrooms	Various taxa			11 607	1 Food
#4	Truffles	Tuber spp.			16 915	1 Food
#5	Cork	Quercus suber L.			11 175	5 Raw material for utensils handicrafts construction
#6	Acorns	Quercus spp.			253	2 Fodder
#7	Pine seeds	Pinus pinea L.			747	1 Food
#8	Blueberries	Vaccinium myrtillus L.			602	1 Food
#9	Strawberries	Fragaria vesca L.			320	1 Food
#10	Raspberries	Rubus idaeus L.			214	1 Food
All other plant products						
All other animal products						
Total					**99 336**	

Name of currency	Euro

Comments

Data updated to 2010. More updated data on NWFP are not available at national level. Some estimates are available for certain products only for few Regions.

8 Sustainable Development Goal 15

8a Sustainable Development Goal 15

SDG Indicator 15.1.1 Forest area as proportion of total land area 2015

Indicator	Percent							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area as proportion of total land area 2015	28.45	30.69	31.61	31.79	31.97	32.16	32.34	32.52

Name of agency responsible	

SDG Indicator 15.2.1 Progress towards sustainable forest management

Sub-Indicator 1	Percent						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Forest area annual net change rate	0.76	0.59	0.58	0.57	0.57	0.57	0.56

Name of agency responsible	

Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	95.20	105.30	110.60	110.60	110.60	110.60	110.60	110.60

Name of agency responsible	

Sub-Indicator 3	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area located within legally established protected areas	30.91	35.12	35.12	35.12	35.12	35.12	35.12	35.12

Name of agency responsible	

Sub-Indicator 4	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area under long-term forest management plan	–	16.97	–	–	–	–	–	–

Name of agency responsible	

Sub-Indicator 5	Forest area (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area under independently verified forest management certification schemes	14.32	774.19	826.16	829.09	840.11	818.27	–	–