

GLOBAL FOREST RESOURCES ASSESSMENT 2015

COUNTRY REPORT

Italy

Rome, 2014

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Global Forest Resources Assessment (FRA). This country report is prepared as a contribution to the FAO publication, the Global Forest Resources Assessment 2015 (FRA 2015).

The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guide for country reporting for FRA 2015 (<http://www.fao.org/3/a-au190e.pdf>). These reports were submitted to FAO as official government documents.

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Introductory Text

Place an introductory text on the content of this report

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Desk Study?

Check "yes" if this survey is a Desk Study, "no" otherwise	
Desk Study?	no

1. What is the area of forest and other wooded land and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

1.1 Categories and definitions

Category	Definition
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.
Other land	All land that is not classified as "Forest" or "Other wooded land".
...of which with tree cover (<i>sub-category</i>)	Land considered as "Other land", that is predominantly agricultural or urban lands use and has patches of tree cover that span more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity. It includes bothe forest and non-forest tree species.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.
Forest expansion	Expansion of forest on land that, until then, was not defined as forest.
...of which afforestation (<i>sub-category</i>)	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 (<i>sub-category</i>)	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 (<i>sub-category</i>)	Human induced conversion of forest to other land use or the permanent reduction of the tree canopy cover below the minimum 10 percent threshold.
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 (<i>sub-category</i>)	Re-establishment of forest through planting and/or deliberate seeding on land already in forest land use.

1.2 National data

1.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAF. 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 NFI1985
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI1985
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

1.2.2 Classification and definitions

National class	Definition
High forest	Forest normally composed of trees originated by seeds.
Coppice	Forest mainly composed of sprouts or root suckers.
Plantations and specialised stands	- For wood production (e.g.: poplars and others rapid-growth species). - For non-wood production (e.g.: chestnut and cork oak).
Particular woody ecosystems: riparian and rupicolous forests	Forest located along rivers or on rocky sites characterised by a crown cover of at least 20% and mainly composed by trees.
Particular woody ecosystems: shrubs	Other wooded land mainly composed by shrubs.
Temporary unstocked areas	Areas temporarily unstocked due to forest harvest, fire or other disturbances
Included areas	Bare patches of land included in forest (smaller than 0.2 ha).
Afforestation	Plantations established on other land

N/A	< 1%) which have not been taken into account in the present report. " /> While the definitions of forest resources adopted by 2005 NFI are fully consistent with FRA ones, 1985 NFI adopted a lower threshold for area (2000 m ²) and a higher threshold for crown cover (20%). Nevertheless, an experimental study (see source De Natale et al.,2003) led to the conclusion that the use of such different definitions implies only negligible differences in terms of area estimates (< 1%) which have not been taken into account in the present report.
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1.2.3 Original data

Forest area	
Forest classes adopted by the first NFI (1985)	Area (ha)
High forest	2178900
average height less than 5 m	254700
average height more than 5 m	1924200
Coppice	3653800
average height less than 5 m	870300
average height more than 5 m	2803500
Plantations and specialised stands	288900
high stand plantations for wood production with more than 5 m of height	117000
of which coniferous	3600
of which broadleaved – Poplars	106200
of which broadleaved – Other broadleaves	7200
High stand plantations with an average height less than 5 m	13500
of which coniferous	4500
of which broadleaved – Poplars	4500
of which broadleaved – Other broadleaves	4500
Other broadleaves coppice plantations	2700

Eucalyptus coppice plantations	900
Chestnut stands for fruit production	90000
Cork oak stands	64800
Particular woody ecosystems: riparian and rupicolous forests	
Riparian forests	110700
Rupicolous forests	575100
Particular woody ecosystems: shrubs	1475100
Temporary unstocked areas	99000
Included areas	273600

Forest classes adopted by the second NFI (2005)	Area (ha)
Forest	8759200
Other Wooded Land	1708333

Forest classes adopted by the second NFI (2015) (provisional estimates)	Area (ha)
Forest	9297078
Other Wooded Land	1813237

Forest expansion, reforestation

Reference period	Afforestation		Natural regeneration
	Total	Of which Introduced Species	
	ha	ha	ha
1994/2000	104142	22730	
2001/2006	54134	10999	
2007/2012	10374	4473	
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.

1.3 Analysis and processing of national data

1.3.1 Adjustment

None needed.

1.3.2 Estimation and forecasting

Forest area

The estimation for 1990 and 2000 was made through a linear interpolation between the 1985 and 2005 data. The estimation for 2010 and 2015 was derived by a linear interpolation of 2005 and provisional data from the on-going photo-interpretation phase of NFI2015. Calculations carried out on data reclassified as shown in next paragraph.

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.

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.

Average annual rate of afforestation for the reporting years has been calculated from the data in the table 1.2.3. "**Forest expansion, reforestation**" (section original data) on the basis of weighed averages derived as follows:

- YEAR 2000
 - Total afforestation $((104\ 142/7)*3+(54\ 134/6)*2)/5 = 12\ 535$ ha
 - Afforestation of introduced species $((22\ 730/7)*3+(10\ 999/6)*2)/5 = 2\ 682$ ha
- YEAR 2005
 - Total afforestation $((54\ 134/6)*4+(10\ 374/6))/5 = 7\ 564$ ha
 - Afforestation of introduced species $((10\ 999/6)*3+(4\ 473/6)*2)/5 = 1\ 616$ ha
- YEAR 2010
 - Total afforestation: $10\ 374/6 = 1\ 729$ ha
 - Afforestation of introduced species: $4473/6 = 746$ ha

The net annual rate of overall forest increase, based on NFI data is: 77 960 ha in the period 1990-2005, 53 788 ha in the period 2006-2015. To better describe the actual phenomenon of forest expansion and to avoid abrupt variations due to the length of the period between two different forest inventories, particularly between the first and the second NFI, the 2005 rate was estimated as the average of the two above mentioned periods. As a result it is not consistent with the expansion rate resulting from the difference between the absolute extent of forest area in the years 1985 and 2005.

1.3.3 Reclassification

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.

Reclassification (Percentage allocation) into FRA classes

National Land use	Percentage of a National class belonging to a FRA Class				
	Forest	Other Wooded Land	Other Land		Inland Water
Total			Other Land with Tree Cover		
Classes 1985					

Percentage	%	%	%	%	%
High forest	100				
Coppice	100				
Plantations and specialised stands	100				
Particular woody ecosystems: riparian and rupicolous forests	100				
Particular woody ecosystems: shrubs		100			
Temporary unstocked areas	100				
Included areas	100				

As a result of the reclassification:

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

This table shows the results of estimation for 1990, 2000, 2005 and provisional estimates for 2010 and 2015 based on reclassified data and on linear interpolation between NFI data for the two periods 1985-2005 and 2005-2015:

<i>Years</i>	Forest (ha)	OWL (ha)
1990	7589800	1533408
2000	8369400	1650025
2005	8759200	1708333
2010	9028139	1760785
2015	9297078	1813237

Forest expansion, reforestation

None.

Preliminary estimates based on partial photo interpretation

1.4 Data

Table 1a

Categories		Area (000 hectares)				
		1990	2000	2005	2010	2015
	Forest	7590	8369	8759	9028	9297
	Other wooded land	1533	1650	1708	1761	1813
	Other land	20291	19395	18947	18625	18304
	... of which with tree cover	N/A	N/A	N/A	N/A	N/A
	Inland water bodies	720	720	720	720	720
	TOTAL	30134.00	30134.00	30134.00	30134.00	30134.00

Table 1b

Categories		Annual forest establishment / loss (000 hectares per year)				...of which of introduced species (000 hectares per year)			
		1990	2000	2005	2010	1990	2000	2005	2010
	Forest expansion	N/A	78	63.5	53.8	N/A	N/A	N/A	N/A
	... of which afforestation	N/A	12.5	7.6	1.7	N/A	2.7	1.6	0.7

	... of which natural expansion of forest	N/A	65.4	55.9	52.1	N/A	N/A	N/A	N/A
	Deforestation	N/A	N/A	N/A	3.69	N/A	N/A	N/A	N/A
	... of which human induced	N/A	N/A	N/A	3.69	N/A	N/A	N/A	N/A
	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

Tiers

Category	Tier for status	Tier for reported trend
Forest	Tier 3	Tier 3
Other wooded land	Tier 3	Tier 3
Forest expansion	Tier 3	Tier 3
Deforestation	Tier 3	Tier 1
Reforestation	Tier 1	Tier 1

Tier criteria

Category	Tier for status	Tier for reported trend
<ul style="list-style-type: none"> • Forest • Other wooded land • Afforestation • Reforestation • Natural expansion of forest • Deforestation 	<p>Tier 3 : Data sources: Either recent (less than 10 years ago) National Forest Inventory or remote sensing, with ground truthing, or programme for repeated compatible NFIs</p> <p>Tier 2 : Data sources: Full cover mapping / remote sensing or old NFI (more than 10 years ago)</p> <p>Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status)</p> <p>Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status)</p> <p>Tier 1 : Other</p>

1.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trends
Forest	<p>The Forest Inventory carried out in 1985, applied the following thresholds to define “Forest land”:</p> <ul style="list-style-type: none"> • Minimum area - 2 000 square meters • Minimum width - 20 m • Minimum crown density - 20% <p>While INFC 2005 adopted definitions and thresholds fully compatible with FRA 2005 ones.</p>	<p>The availability of new, even if partial, NFI data on forest resources allows a revision of FRA2010 estimation. As a result, their extent referring to 2010 has slightly decreased. The combination of last two sets of NFI data shows also a decrease of the annual increment versus what reported in FRA2010. As already stated in FRA2005 and 2010, forest expansion is mainly due to abandonment of former agricultural lands and pastures.</p>

Other wooded land	As the definition of OWL was not yet existing at the time, the 1985 NFI did not report any data on this class. As a consequence, the class “Particular woody ecosystems - shrubs” has been assigned to OWL, after expert estimation.	The trend of OWL is in line with the one characterizing the forest area
Other land	Calculated by subtracting the extent of forest, other wooded land and inland water bodies from total country surface reported in FAOSTAT.	N/A
Other land with tree cover	N/A	N/A
Inland water bodies	Data from FAOSTAT database.	N/A
Forest expansion	Derived variable Afforestation The only reliable data on afforestation refers to the interventions funded under the Rural Development Schemes adopted by Italian Regions and approved by the European Commission. The major part of these plantations are based on autochthonous species. As a result, this estimation can be considered partial and does not take into account other undetected activities of afforestation.	Linear trend due to the estimation method adopted Afforestation The trend is influenced by rural development policy.
Deforestation	Just a small amount of the deforestation has been detected in last decades. No data available for previous reporting years.	N/A
Reforestation	Natural Forest under coppice management not included in the estimation.	N/A

Other general comments to the table

Thanks to NFI2005 and the just started third NFI (NFI2015) the figures reported in the present report are much more reliable than the previous Italian FRA releases. 2015 figures are based on provisional estimates (derived from the first phase – photo-interpretation - of the third NFI, no ground truth available at present). 1990, 2000 and 2010 figures are all based on interpolation of NFI data.

2. What is the area of natural and planted forest and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

2.1 Categories and definitions

Term	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Naturalized introduced species	Other naturally regenerated forest where the tree species are predominantly non-native and do not need human help to reproduce/maintain populations over time.
Introduced species	A species, subspecies or lower taxon occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
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.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
...of which of introduced species (<i>sub-category</i>)	Other naturally regenerated forest where the trees are predominantly of introduced species.
...of which naturalized (<i>sub-sub category</i>)	Other naturally regenerated forest where the trees are predominantly of naturalized introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
...of which of introduced species (<i>sub-category</i>)	Planted forest where the planted/seeded trees are predominantly of introduced species.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
...of which planted (<i>sub-category</i>)	Mangroves predominantly composed of trees established through planting.

2.2 National data

2.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAF. 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
4	N/A	N/A	N/A	N/A

2.2.2 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

2.2.3 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 <i>Ailanthus altissima</i>)	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

2.3 Analysis and processing of national data

2.3.1 Adjustment

No calibration was made.

2.3.2 Estimation and forecasting

The only usable information on primary forest is derivable from the 2005 NFI extent of old-growth forest ecosystems located within core areas in national parks. Due to the fact that primary forest area can not increase in relatively short periods, the reported value of 93 127 ha must be considered the minimum documented extent for the whole observation time. At the same time, as these ecosystems have been historically protected, it is possible to assume that the cited value has not even decreased in recent years. Even if the reported figure is underestimated because it only takes into account forest in protected areas, it has been preferred to the expert estimation (160 000 ha) mentioned in the FRA2005 report.

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 2nd 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.

2.3.3 Reclassification

	Primary	Other naturally regenerated	Other naturally regenerated – Introduced species	Planted Forest	Planted Forest Introduced species
Naturally originated forest					
Old-growth highly protected forest	100 %				
Seminaturally originated forest		100%			
Artificially originated forest (planted forest)				100%	

Forest dominated by invasive species (Black locust and <i>Ailanthus altissima</i>)			100%		
Productive Plantations				100%	
Poplar plantations				100%	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%	

2.4 Data

Table 2a

Categories		Forest area (000 hectares)				
		1990	2000	2005	2010	2015
	Primary forest	93	93	93	93	93
	Other naturally regenerated forest	6950	7692	8064	8314	8565
	... of which of introduced species	201	223	234	241	248

	... of which naturalized	201	223	234	241	248
	Planted forest	547	584	602	621	639
	... of which of introduced species	124	104	93	93	93
TOTAL		7590.00	8369.00	8759.00	9028.00	9297.00

Table 2b

Primary forest converted to (000 ha)								
1990-2000			2000-2010			2010-2015		
Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land	Other natural regeneration	Planted	Other land
0	0	0	0	0	0	0	0	0

Table 2c

Categories	Area (000 hectares)				
	1990	2000	2005	2010	2015
Mangroves (forest and OWL)	0	0	0	0	0
... of which planted	0	0	0	0	0

Tiers

Category	Tier for status	Tier for reported trend
Primary forest	Tier 3	Tier 2
Other naturally regenerated forest	Tier 3	Tier 2
Planted forest	Tier 3	Tier 2
Mangroves	Tier 3	Tier 3

Tier Criteria

Category	Tier for status	Tier for reported trend
Primary forest/Other naturally regenerated forest/Planted forest	<p>Tier 3 : Data sources: Recent (less than 10 years) National Forest Inventory or remote sensing with ground truthing or data provided by official agencies or programme for repeated compatible NFIs</p> <p>Tier 2 : Data sources: Full cover mapping/ remote sensing or old NFI (more than 10 years) Tier 1 : Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>

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.
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.
Mangroves	N/A	N/A

Other general comments to the table

N/A

3. What are the stocks and growth rates of the forests and how have they changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

3.1 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees with a minimum diameter of 10 cm at breast height (or above buttress if these are higher). Includes the stem from ground level up to a top diameter of 0 cm, excluding branches.
Net Annual Increment (NAI)	Average annual volume of gross increment over the given reference period less that of natural losses on all trees, measured to minimum diameters as defined for "Growing stock".
Above-ground biomass	All living biomass above the soil including stem stump branches bark seeds and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
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 and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in above-ground biomass	Carbon in all living biomass above the soil including stem stump branches bark seeds and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in 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 and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm) lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a soil depth of 30 cm.

3.2 National data

3.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste-ISAFSA , 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	Fattorini L. et al., 2004 – Above-ground tree phytomass prediction and preliminary shrub phytomass assessment in the forest stands of Trentino – Sudi Trent, Sci.Nat., Acta Biol., 81 (2004)	Phytomass of Forest trees and shrubs	2004	N/A
5	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.	Phytomass of Forest trees	2005	N/A
6	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.	Phytomass of Forest trees	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	2008	Hereinafter NFI2005 additional survey
8	Tabacchi G., De Natale F., Gasparini P. 2010 - Coerenza ed entità delle statistiche forestali. Sherwood, n. 165: 11-19	Net Annual Increment Trend of Growing stock	1990-2010	N/A
9	Forest Europe, SOEF2011 (National Report)	Forest type area	1990-2010	N/A

3.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees with a minimum diameter of 4,5 cm at breast height. Excludes the stem from ground level up to a top diameter of 0 cm, including branches.
Net annual increment (NAI)	Consistent with FRA one
Above-ground biomass	Consistent with FRA one
Below-ground biomass	Consistent with FRA one
Dead wood	4,5 cm." /> 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.
Carbon in above-ground biomass	Consistent with FRA one
Carbon in below-ground biomass	Consistent with FRA one
Carbon in dead wood	4,5 cm." /> Carbon in 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.

Carbon in litter	Consistent with FRA one
Soil carbon	Consistent with FRA one

3.2.3 Original data

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Growing stock

NFI 1985

Forest classes ¹	Area (ha)	Volume/ha (m ³ /ha)	Total volume (m ³)
High forest			
average height less than 5 m	254700	n.a.*	n.a.*
average height more than 5 m	1924200	211	405720472
Of which conifers:			
- Norway spruce	n.s.*	n.s.*	117543379
- Silver fir	n.s.*	n.s.*	23245024
- Larches	n.s.*	n.s.*	49017886
- Mountain pines	n.s.*	n.s.*	49974017
- Mediterranean pines	n.s.*	n.s.*	13365769
- Other conifers	n.s.*	n.s.*	3021422
Of which broadleaves:			
- Beech	n.s.*	n.s.*	70243581

- Turkey oak	n.s.*	n.s.*	16443298
- Other oaks	n.s.*	n.s.*	20587540
- Other broadleaves	n.s.*	n.s.*	42278552
Coppice			
average height less than 5 m	870300	n.a.*	n.a.*
average height more than 5 m	2803500	115	323391713
Of which conifers	n.s.*	n.s.*	11409590
Of which broadleaves:			
- Beech	n.s.*	n.s.*	60939254
- Chestnut	n.s.*	n.s.*	74612238
- Hornbeams sp.	n.s.*	n.s.*	28940076
- Other oaks	n.s.*	n.s.*	33857781
- Turkey oak	n.s.*	n.s.*	36594099
- Evergreen oaks	n.s.*	n.s.*	16446998
- Other broadleaves	n.s.*	n.s.*	60591673
Plantations and specialised stands			
high stand plantations for wood production	117000	95	11148402
of which coniferous	3600	n.a.*	436960
of which broadleaved:			
- Poplars	106200	n.a.*	10100841
- Other broadleaves	7200	n.a.*	610600
High stand plantations with an average height less than 5 m	13500	n.a.*	n.a.*
Of which coniferous	4500	n.a.*	n.a.*
Of which broadleaved			

- Poplars	4500	n.a.*	n.a.*
- Other broadleaves	4500	n.a.*	n.a.*
Other broadleaves coppice plantations	2700	58.3	157410
Eucalyptus coppice plantations	900	n.a.*	n.a.*
Chestnut stands for fruit production	90000	n.a.*	n.a.*
Cork oak stands	64800	n.a.*	n.a.*
Particular woody ecosystems: riparian and rupicolous forests			
Riparian forests	110700	n.a.*	n.a.*
Rupicolous forests	575100	n.a.*	n.a.*
Particular woody ecosystems: shrubs	1475100	n.a.**	n.a.**
Temporary unstocked areas	99000	n.s.**	n.s.**
Included areas	273600	n.s.**	n.s.**

Source: First Italian NFI (1985 data)

1. For Forest classes definitions refer to table 1 (Forest area)

n.s.* original data of growing stock refers to individual trees. Thus, area or density are not significant;

n.s.** bare land;

n.a.* data not originally available: this information will be derived combining area from the 1stNFI and average volume/ha from the 2ndNFI ;

n.a.** data not originally available: it will be estimated combining the results of 1stNFI , 2ndNFI and some research projects.

Moreover, other pieces of information contained in 1985 NFI and useful for growing stock calculation are:

- percentage of Rupicolous forest dominated by conifers: 26.9%
- percentage of Rupicolous forest dominated by broadleaves: 73.1%

NFI 2005

Forestclasses	Area (ha)	Volume/ha (m ³ /ha) dbh>10 cm	Total volume (m ³) dbh>10 cm
Total	10467533	n.a.***	n.a.***
Forest	8759200	134.0	1174061038
Other wooded Land	1708333	n.a.***	n.a.***
Forest Coniferous Volume*	n.s.*	n.s.*	453779359
Forest Broadleaved Volume*	n.s.*	n.s.*	720281679
Commercial species*	n.s.*	n.s.*	1174061038
Growing stock distribution by species:			
- Beech	n.s.*	n.s.*	207065160
- Norway spruce	n.s.*	n.s.*	200634780
- Chestnut	n.s.*	n.s.*	122051160
- Turkey oak	n.s.*	n.s.*	83143000
- Larches	n.s.*	n.s.*	79984300
- Downy oak	n.s.*	n.s.*	63564880
- Hop-hornbeam	n.s.*	n.s.*	32057200
- Holm oak	n.s.*	n.s.*	26149500

- Silver fir	n.s.*	n.s.*	33936420
- Black pine	n.s.*	n.s.*	29746650
- Other species	n.s.*	n.s.*	295727987

Source: 2nd Italian NFI

n.a.*** data not originally available: to be estimated combining the results of 2ndNFI and some research projects

Following 2nd NFI data is the basis for growing stock calculation of forest types whose volumes were not calculated in 1985:

- high forest with average height less than 5 m: 20.3 m³ /ha;
- coppice with average height less than 5 m: 24.5 m³ /ha;
- Eucalyptus coppice with average height less than 5 m: 17.7 m³ /ha;
- plantations of average height less than 5 m: 12.1 m³ /ha;
- chestnut stands for fruit production: 169.3 m³ /ha;
- cork oak stands: 50.1 m³ /ha;
- riparian forests: 106.5 m³ /ha;
- rupicolous: 58 m³ /ha.
- The volume of small trees calculated on the basis of the 2nd NFI is 4 m³ /ha.
- the volume of trees with diameter ranging from 4.5 to 10 cm is equal to 1.72% and 10.72% of total growing stock, respectively for conifers and broadleaves.

As regards other wooded land, original data available is:

- average shrub dry phytomass: 39.86 metric tons/ha;

(Sources: 1 - database of Ri.Selv.Italia Research Project; 2 - Fattorini et al., 2004)

- average ratio between volume (cubic meters) and dry phytomass for plants (metric tons) under 5 m of height: 0.91;

(Source: 2nd NFI)

- percentage of coniferous, broadleaved and mixed Other Wooded Land area: 7.2%, 83.9% and 8.9 %, respectively.

(Source: 2nd NFI)

Data collected by a study concerning forest expansion in North-Eastern Alps has been used to estimate growing stock density per hectare of new stands: 9.8 m³ /ha (Tabacchi et al., 2010).

GS trend

The GS for the years 2010 and 2015 has been estimated using the results of a linear interpolation between 1985 and 2005 GS figures.

As a consequence of the reduction of Forest expansion rate observed after 2005 (from 77.9 thousands ha in the period 1985-2005 to 53.8 thousands ha in the period 2005-2015), it has not deemed appropriate to simply extrapolate 2010 and 2015 figures. To avoid this potential embedded overestimation, for each year after 2005 a volume retrieved as follows has been subtracted:

$9.38 \text{ m}^3/\text{ha}$ (GS density of new forests) * (77.9-53.8) thousands hectares.

Net annual Increment (NAI)

Gross Annual Increment: $30\,421\,548 \text{ m}^3$ (1985) and $35\,872\,293 \text{ m}^3$ (2005 estimates for dbh # 10 cm), derived from NFI-1985 and NFI-2005

Gross Annual Increment by forest types: according to NFI2005, broadleaves represent the 69.3% and conifers the remaining 30.7% of the whole GAI (according to estimates for dbh# 10 cm).

Natural losses: Natural losses according to the cited study (Tabacchi et al. 2010) cited among data sources correspond to the 12.6% of the Gross Annual Increment. This percentage has been applied to all reporting years.

Biomass stock

Forest total phytomass (NFI 2005, dbh# 10 cm) is equal to 786 850 134 metric tons of which:

Conifers = 236 420 851 metric tons

Broadleaves = 550 429 283 metric tons

As regards dead wood biomass, the following data is provided by INFC Phase 3+ (referred to 2005):

Coarse deadwood biomass $34\,315\,177 \text{ m}^3$ (total forest)

Fine deadwood biomass $15\,395\,840 \text{ m}^3$ (total forest)

Carbon stock

Original average Carbon data relating to Forest litter and soil is from the NFI2005 additional survey (see mentioned data sources) and is respectively equal to 3.2 ton/ha and 81.7 ton/ha.

3.3 Analysis and processing of national data**3.3.1 Adjustment****Growing stock**

No calibration needed.

Biomass stock

None needed.

Carbon stock

None needed.

3.3.2 Estimation and forecasting**Growing stock**

The estimation of some missing original 1985 growing stock values (not particularly important in quantitative terms, but necessary for the full consistency of the methodological process adopted) has been carried out. In the following table mean volumes per hectare, retrieved from 2ndNFI, have been applied to 1stNFI areas to estimate missing growing stock components (e.g. stands with height less than 5 m and shrubs).

Forestclasses	Area (ha)	Volume/ha (m³/ha)	Total volume (m³)	NOTES
High forest				
average height less than 5 m	254700	20.3	5170410	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).

Coppice				
average height less than 5 m	870300	24.5	21322350	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Plantations and specialised stands				
Young Eucalyptus coppice stands (always under 5 m of height)	900	17.7	15930	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Plantations under 5 m of average height	13500	12.1	163350	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Of which coniferous	4500	12.1	54450	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Of which broadleaved-Poplars	4500	12.1	54450	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Of which broadleaved - Other broadleaves	4500	12.1	54450	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Chestnut stands for fruit production	90000	169.3	15237000	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).

Cork oak stands	64800	50.1	3246480	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
<i>Particular woody ecosystems</i>				
Riparian forest (this category includes mainly hygrophilous Broadleaves)	110700	106.5	11789550	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data).
Rupicolous forests	575100	58.0	33355800	Rupicolous holm oak growing stock per hectare (2 nd NFI data) by total forest class area (1 st NFI data).
Shrubs	1475100	36.4	53693640	Growing stock per hectare (2 nd NFI data) by area (1 st NFI data). The growing stock per hectare has been obtained multiplying 39.86 (average shrub dry phytomass) by 0.91 (average ratio volume/ dry phytomass). See original data paragraph.

The estimates resulting from the previous calculations have been broken down into forest types and groups of species:

Forestclasses	Class Total volume (m ³)	%	Subclass Total volume (m ³)	NOTES
High Forest < 5 m of height	5170410			
of which conifers:		63.1	3262529	The total growing stock of stands less than 5 m of height has been assigned to each group of species, applying the same percentages of higher stands (1 st NFI).
- Norway spruce		29.0	1499419	
- Silver fir		5.7	294713	
- Larches		12.1	625620	
- Mountain pines		12.3	635960	
- Mediterranean pines		3.3	170624	
- Other conifers		0.7	36193	
of which broadleaves:		36.9	1907881	
- Beech		17.3	894481	
- Turkey oak		4.1	211987	
- Other oaks		5.1	263691	
- Other broadleaves		10.4	537723	
Coppice < 5 m of height	21322350			
of which scattered conifers		3.5	746282	
of which broadleaves:		96.5	20576068	
- Beech		18.8	4008602	
- Chestnut		23.1	4925463	
- Hornbeams		9	1919012	
- Other oaks		10.5	2238847	

- Turkey oak		11.3	2409426	
- Evergreen oaks		5.1	1087440	
- Other broadleaves		18.7	3987279	
Rupicolous	33 355 800			
of which coniferous		26.9	8972710	Estimate based on the percentage of (1 st NFI) stands with a prevailing broadleaved or coniferous component, applied to the volume of total rupicolous forest.
of which broadleaved		73.1	24383090	
Shrubs	53693640			
of which coniferous		11.6	6228462	Estimate made on the basis of the 2 nd NFI data on conifers/ broadleaves ratio of OWL area. Mixed OWL equally assigned to both classes.
of which broadleaved		88.4	47465178	

In the following table, original data and estimates reported above have been summed up to compute comprehensive growing stock data.

Forestclasses	GS of stands with height > 5 m	GS of stands with height < 5 m	Total GS
High forest - conifers			
- Norway spruce	117543 379	1499419	119042798
- Silver fir	23245024	294713	23539737
- Larches	49017886	625620	49643506

- Mountain pines	49974017	635960	50609977
- Mediterranean pines	13365769	170624	13536393
- Other conifers	3021422	36193	3057615
Total conifers GS in high forest (C1)	256167497	3262529	259430026
High forest - broadleaves			
- Beech	70243581	894481	71138062
- Turkey oak	16443298	211987	16655285
- Other oaks	20587540	263691	20851231
- Other broadleaves	42278552	537723	42816275
Total broadleaves GS in high forest (B1)	149552971	1907882	151460853
Grand Total GS in High forest			410890879
Coppice – conifers			
- scattered conifers (C2)	11409590	746282	12155872
Coppice-broadleaves			
- Beech	60939254	4008602	64947856
- Chestnut	74612238	4925463	79537701
- Hornbeams sp.	28940076	1919012	30859088
- Other oaks	33857781	2 238 847	36096628
- Turkey oak	36594099	2409426	39003525
- Evergreen oaks	16446998	1087440	17534438
- Other broadleaves	60591673	3987279	64578952
Total broadleaves GS in coppice (B2)	311982119	20576069	332558188
Grand Total GS in Coppice			344714060
Plantations and specialised stands			

Conifers (C3)	436960	54450	491410
- Poplars (high forest)	10100841	54450	10155291
- Other broadleaves (high forest)	610600	54450	665050
Other broadleaves (coppice)	157410	0	157410
Eucalyptus (coppice)	ns	15930	15930
Chestnut stands for fruit production	15237000	n.s.	15237000
Cork oak stands	3246480	n.s.	3246480
Total broadleaves GS in Plantations (B3)	29352331	124830	29477161
Total GS in Plantations 29968571			
Particular woody ecosystems: riparian and rupicolous forests			
Riparian forests (B4)	11789550	n.s.	11789550
Rupicolous forests - coniferous (C4)	8972710	n.s.	8972710
Rupicolous forests - broadleaved (B5)	24383090	n.s.	24383090
Total GS in particular woody ecosystems: riparian and rupicolous forest 45145350			

The sum of all components reported above provides the total growing stock of Forest (830718860 m³) of which:

- coniferous (C1+C2+C3+C4) equal to 281050018 m³ (**33.8** % of the total value);
- broadleaved (B1+B2+B3+B4+B5) equal to 549668842 m³ (**66.2** % of the total value).

To compare 1st and 2nd NFI Forest growing stock data, volumes referring to trees with diameter between 2.5 and 4.5 cm (hereinafter “small trees”) have been estimated from the 1st NFI figures (see following table).

1985 Forest class with original growing stock data	Area (ha)	Mean Small tree growing stock (m³/ha)	Small tree growing stock (m³)
High Forest > 5 m	1924200	4	7696800
Coppice > 5 m	2803500	4	11214000
High stand wood plantations > 5m	117000	4	468000
Other broadleaves coppice wood plantations	2700	4	10800
Total	4847400	4	19389600

In the table below small tree volumes have been assigned to the coniferous or the broadleaved component on the basis of the same percentages found for the original 1985 growing stock data.

1985 Forest class with original growing stock data	Total Small tree growing stock (m³)	Small tree growing stock		Small tree growing stock	
		Conifers		Broadleaves	
		%	m³	%	m³
High Forest > 5 m	7696800	63.10	4856681	36.90	2840119
Coppice > 5 m	11214000	3.50	392490	96.50	10821510
High stand wood plantations > 5m	468000	3.90	18252	96.10	449748
Other broadleaves coppice wood plantations	10800	0	0	100	10800

Plantations - Total	478800	-	18252	-	460548
Total	19389600	-	5267423	-	14122177

To make growing stock 1985 values consistent with 2005 ones, small tree volumes have been subtracted from the total growing stock (T-S), both for conifers and broadleaves.

Moreover to be consistent with FRA2015 definition, volumes of trees with diameter between 4.5 and 10 have been subtracted. According to 2nd NFI data, the volume of trees with diameter ranging from 4.5 to 10 cm is equal to 1.03% and 11.18% of total growing stock, respectively for conifers and broadleaves. The growing stock with dbh>10cm has been considered equal to 98.97% (=100-1.03) and 88.82% (=100-11.18) of the T-S volume respectively for conifers and broadleaves, as shown in the following tables:

1985 Forest class with original growing stock data	Conifer Growing stock (m ³)			
	Total (T)	Small trees (S)	T - S	GS with dbh >10 cm
High Forest	259430026	4856681	254573345	251952718
Coppice	12155872	392490	11763382	11642287
Plantations	491410	18252	473158	468287
Particular woody ecosystems	8972710	n.s.	8972710	8880343
Total Forest GS	281050018	5267423	275782595	272943636

1985 Forest class with original growing stock data	Broadleaves Growing stock (m ³)			
	Total (T)	Small trees (S)	T - S	GS with dbh >10 cm
High Forest	151460853	2840119	148620734	132009512
Coppice	332558188	10821510	321736678	285776424
Plantations	29477161	460548	29016613	25773449
Particular woody ecosystems	36172640	n.s.	36172640	32129653
Total Forest GS	549668842	14122177	535546665	475689038

In the calculation of the growing stock it was made the assumption that, in terms of volume, the top part of the stems equals the branches. Therefore, no correction to original data has been applied.

As regards OWL GS, the estimation is not possible due to the lack of information concerning diameters under 10 cm. Furthermore, the majority of plants in such category usually falls under the cited threshold.

Net Annual Increment

Data reported in the following table is the result of a linear inter/extrapolation of the Gross annual increment (GAI) values related to 1985 and 2005. Natural losses have been calculated applying the mentioned percentage of 12.6% .

2010 and 2015 GAI amounts have been reduced considering the already described decrease of forest expansion annual rate. For this reason it has been assumed that the volume of 0.94 m³ /ha/year represents the mean GAI and that the average medium age of new stands is 10 years.

As 9.38 m³ /ha is the GS of such new stands, the rounded NAI is equal to 0.94 m³ /ha/year.

NAI = GAI-Natural losses

The portion of NAI due to trees with dbh<10 cm, calculated following the same estimation procedure applied for GS, has been then subtracted from the values in the above table.

Values in 1000 m³

Year	Gross annual increment (dbh>5)	Natural losses (dbh>5)	Net annual increment (dbh>5)	NAI_dbh>10cm
1990	31784	4005	27779	24630
2000	34510	4348	30162	26743
2005	35872	4520	31352	27798
2010	37122	4689	32524	28767
2015	38371	4860	33715	29735

Following NAI specifications derived applying the Coniferous and Broadleaved GAI quotas from NFI2005

Category	Net annual increment				
	1990	2000	2005	2010	2015
NAI in Coniferous Forest	n.a.	8198	8521	8818	9115
NAI in Broadleaved Forest	n.a.	18545	19277	19949	20620

For the reporting years 2000/2005, such figures in thousands cubic meters have been related to the total forest area as reported in table 1.

Biomass stock

Conversion factors to retrieve total above-ground biomass amount of conifers and broadleaves from GS (respectively equal to 0.52 and 0.78) are based on original NFI2005 data.

As concerns below-ground biomass, above-ground values have been multiplied by IPCC ratios (Appendix 5, table 5.3) suggested for temperate forest, specifically: 0.29 for Conifers and 0.23 for Broadleaves.

Total dead wood biomass (coarse + fine, in terms of dry weight) for the year 2005 is provided by NFI2005 additional survey. For other reporting years, the ratio between total dead wood biomass and growing stock derived from NFI2005 data, equal to 0.057, has been applied to growing stock figures of table 3a.

Carbon stock

Carbon content of dead wood and above and below-ground biomass have been calculated multiplying Forest biomass values by carbon content fraction suggested by IPCC. Despite to what reported for FRA2010 (when a default conversion factor of 0.47 was applied), this time, according to IPCC2003 Guidance for LULUCF, a conversion factor equal to 0.5 has been applied. As a result the estimation here made are fully consistent with the ones in the National submission to UNFCCC and Kyoto Protocol (first reporting period 2008-2013).

3.3.3 Reclassification

Growing stock

1985 NFI Reclassification matrix

National Classification	FRA categories		
	Forest (%)	OWL (%)	Total (%)
High Forest	100	0	100

Coppice	100	0	100
Plantations and specialised stands	100	0	100
Particular woody ecosystems: riparian and rupicolous forests	100	0	100
Particular woody ecosystems: shrubs	0	100	100

Biomass and Carbon stock

No reclassification used.

3.4 Data

Table 3a

Category		Growing stock volume (million m ³ over bark)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
	Total growing stock	855	1068	1174	1279	1385	N/A	N/A	N/A	N/A	N/A
	... of which coniferous	318	409	454	498	544	N/A	N/A	N/A	N/A	N/A
	... of which broadleaved	537	659	720	781	841	N/A	N/A	N/A	N/A	N/A

Table 3b

Category/Species name			Growing stock in forest (million cubic meters)			
Rank	Scientific name	Common name	1990	2000	2005	2010
1 st	<i>Fagus sylvatica</i>	Beech	148.5	187.6	207.1	225.8
2 nd	<i>Picea abies</i>	Norway spruce	138.5	179.9	200.6	218.8
3 rd	<i>Castanea sativa</i>	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

THE PRE-FILLED VALUES FOR GROWING STOCK REFER TO THE FOLLOWING THRESHOLD VALUES (SEE TABLE BELOW)

Item	Value	Complementary information
Minimum diameter (cm) at breast height of trees included in growing stock (X)	4.5 cm	This is the original NFI threshold. All data has been adjusted to meet the new FRA2015 threshold equal to 10 cm.
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	5.0 cm	N/A
Minimum diameter (cm) of branches included in growing stock (W)	5.0 cm	N/A
Volume refers to above ground (AG) or above stump (AS)	AS	N/A

PLEASE NOTE THAT THE DEFINITION OF GROWING STOCK HAS CHANGED AND SHOULD BE REPORTED AS GROWING STOCK DBH 10 CM INCLUDING THE STEM FROM GROUND LEVEL UP TO A DIAMETER OF 0 CM, EXCLUDING BRANCHES.

Table 3c

Category		Net annual increment (m ³ per hectare and year)				
		Forest				
		1990	2000	2005	2010	2015
	Net annual increment	3.25	3.2	3.17	3.19	3.2
	... of which coniferous	N/A	0.98	0.97	0.98	0.98

CFRQ	... of which broadleaved	N/A	2.22	2.2	2.21	2.22
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Table 3d

Category		Biomass (million metric tonnes oven-dry weight)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
CFRQ	Above ground biomass	641	797	874	951	1028	N/A	N/A	N/A	N/A	N/A
CFRQ	Below ground biomass	158	196	215	235	254	N/A	N/A	N/A	N/A	N/A
CFRQ	Dead wood	36	45	50	54	58	N/A	N/A	N/A	N/A	N/A
TOTAL		835.00	1038.00	1139.00	1240.00	1340.00	.00	.00	.00	.00	.00

Table 3e

Category		Carbon (Million metric tonnes)									
		Forest					Other wooded land				
		1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
CFRQ	Carbon in above ground biomass	321	398	437	476	514	N/A	N/A	N/A	N/A	N/A
CFRQ	Carbon in below ground biomass	79	98	108	117	127	N/A	N/A	N/A	N/A	N/A
CFRQ	<i>Subtotal Living biomass</i>	400	496	545	593	641	N/A	N/A	N/A	N/A	N/A
CFRQ	Carbon in dead wood	18	23	25	27	29	N/A	N/A	N/A	N/A	N/A
CFRQ	Carbon in litter	24	27	28	29	30	N/A	N/A	N/A	N/A	N/A
CFRQ	<i>Subtotal Dead wood and litter</i>	42	50	53	56	59	N/A	N/A	N/A	N/A	N/A
CFRQ	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
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Tiers

Variable/category	Tier for status	Tier for trend
Total growing stock	Tier 3	Tier 2
Net annual increment	Tier 3	Tier 2
Above ground biomass	Tier 3	Tier 2
Below ground biomass	Tier 3	Tier 2
Dead wood	Tier 3	Tier 2
Carbon in above-ground biomass	Tier 3	Tier 2
Carbon in below ground biomass	Tier 3	Tier 2
Carbon in dead wood and litter	Tier 3	Tier 2
Soil carbon	Tier 3	Tier 2

Tier criteria

Category	Tier for status	Tier for reported trend
Total growing stock	Tier 3: Data sources Recent 10 years National Forest Inventory or remote sensing with ground truthing or programme for repeated compatible NFI 10 years Domestic volume functions Tier 2: Data sources/registers and statistics modelling or old NFI 10 years or partial field inventory Tier 1: Other data sources	Tier 3: Estimate based on repeated compatible tiers 3 (tier for status) Domestic growth functions Tier 2: Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 tier for status Tier 1: Other
Net annual increment	Tier 3: Scientifically tested national volume and growth functions Tier 2: Selection of volume and growth functions as relevant as possible Tier 1: Other	Tier 3: Confirmation/adjustment of functions used through scientific work Tier 2: Review work done to seek alternative functions Tier: 1 Other
Biomass	Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied or other domestic or otherwise nationally relevant biomass studies Tier 2: Application of country specific national or sub-national biomass conversion factors from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

<ul style="list-style-type: none"> • Carbon in above ground biomass • Carbon in below ground biomass • Carbon in dead wood and litter • Soil carbon 	<p>Tier 3: Country-specific national or sub-national biomass conversion expansion factors applied Tier 2: Application of country specific national or sub-national biomass conversion factors form from other country with similar climatic conditions and forest types Tier 1: International/regional default biomass expansion factors applied</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>
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3.5 Comments on growing stock biomass and carbon

Category	Comments related to data definitions etc	Comments on the reported trend
Total growing stock	The reclassification procedure for 1985 NFI GS data made this consistent with 2005 NFI data set. The estimation in the last NFI 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 volume and above-ground phytomass from diameter at breast height and total tree height.	During the observation period, annual removals have averagely been around the 25% of the NAI. Thus total growing stock has been regularly augmenting.
Growing stock of broadleaved coniferous	As above	Available data (just two NFI completed in the reporting period) do not allow to comment on a real trend
Growing stock composition	In terms of species component, highly reliable data are available for almost all species (NFI- 2005).	As above
Net annual increment	As for total growing stock	As above
Above-ground biomass	2005 data is highly reliable because 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	As above
Below-ground biomass	Data is based on IPCC conversion factors applied to above-ground biomass data.	As above
Dead wood	2005 data is highly reliable because based on measured dead volume and dry weight. Other reporting years have been assessed on the assumption that dead wood/A.G. biomass is constant in time.	As above
Carbon in above-ground biomass	Data on carbon content are obtained by applying the carbon fraction suggested by IPCC2003 to highly reliable estimates of biomass (in terms of dry weight) derived from ground measurements.	As above
Carbon in below-ground biomass	As above	As above
Carbon in dead wood	As above	As above

Carbon in litter	Carbon data relating to Forest litter and soil is provided by NFI2005 additional survey	As above
Soil carbon	As above	As above

Other general comments to the table

Note of Table 3b - Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

4. What is the status of forest production and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

4.1 Categories and definitions

Term	Definition
Primary designated 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.
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.
Category	Definition
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.
Total wood removals	The total of industrial round wood removals and woodfuel removals.
...of which woodfuel	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

4.2 National data

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 functions	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 functions	2005	Hereinafter NFI2005
3	FRA 2005	Designated functions	1990 2000	N/A

4	ISTAT 2008	Commercial value of NWFP	2008	N/A
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4.2.2 Classification and definitions

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

4.2.3 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

4.3 Analysis and processing of national data

4.3.1 Adjustment

None needed.

4.3.2 Estimation and forecasting

Figures for intermediate reporting years have been obtained by means of linear interpolation of 1985 and 2005, while for 2010 and 2015, 2005 data has been repeated.

•

4.3.3 Reclassification

Original 1985 and 2005 classes mentioned above (Wood and non wood Production) have been logically reclassified along with corresponding FRA 2010 categories.

1985 and 2005 classes		Production	
Plantations		100%	
Coppice		100%	
Stands managed for non wood productions	100%		

4.4 Data

Table 4a

Categories	Forest area (000 hectares)				
	1990	2000	2005	2010	2015

	Production forest	3936	3962	3975	3983	3990
	Multiple use forest	0	0	0	0	0

Table 4b

Rank	Name of product	Key species	Commercial value of NWFP removals 2010 (value 1000 local currency)	NWFP category
1 st	Hazelnuts	<i>Corylus avellana</i> L.	16084	1
2 nd	Chestnuts	<i>Castanea sativa</i> Miller	41419	1
3 rd	Mushrooms	Various taxa	11607	1
4 th	Truffles	Tuber spp.	16915	1
5 th	Cork	<i>Quercus suber</i> L.	11175	5
6 th	Acorns	<i>Quercus</i> spp.	253	2
7 th	Pine seeds	<i>Pinus pinea</i> L.	747	1
8 th	Blueberries	<i>Vaccinium myrtillus</i> L.	602	1
9 th	Strawberries	<i>Fragaria vesca</i> L.	320	1
10 th	Raspberries	<i>Rubus idaeus</i> L.	214	1
TOTAL			99336.00	

2010	
Name of local currency	euro

Category
Plant products / raw material
1 Food
2 Fodder
3 Raw material for medicine and aromatic products
4 Raw material for colorants and dyes
5 Raw material for utensils handicrafts construction
6 Ornamental plants

7 Exudates
8 Other plant products
Animal products / raw material
9 Living animals
10 Hides skins and trophies
11 Wild honey and beeswax
12 Wild meat
13 Raw material for medicine
14 Raw material for colorants
15 Other edible animal products
16 Other non-edible animal products

Table 4c Pre-filled data from FAOSTAT

Year	FRA 2015 category (1000 m ³ u.b.)	
	Total wood removals	...of which woodfuel
1990	7972	3637
1991	8327	4239
1992	8357	4832
1993	8818	4698
1994	9465	5481
1995	9736	5263
1996	9121	4958
1997	9146	5222
1998	9550	5183
1999	11138	6925
2000	9329	5680
2001	8099	5150
2002	7511	4883

2003	8219	5580
2004	8697.4	5814.08
2005	8690.9	5673.46
2006	8618.3	5605.52
2007	8125	5133.86
2008	8667	5673.34
2009	8080.3	5352.26
2010	7843.8	5196.56
2011	7744.5	5388.49

Tiers

Category	Tier for status	Tier for reported trend
Production forest	Tier 3	Tier 3
Multiple use forest	Tier 1	Tier 1

Tier Criteria

Category	Tier for status	Tier for reported trend
Production forest Multiple use forest	Tier 3: Updated including field verifications national forest maps including functions Tier 2: Forest maps older than 6 years including forest functions Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

4.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Production forest	Although the extent of productive forest is significant in Italy, the annual rate of removal is very low.	The situation is stable in time.
Multiple use forest	This category is not provided by the NFI.	N/A
Total wood removals	All data prefilled, but 2011(JFQ national report)	N/A
Commercial value of NWFP	Last annual data available, here reported, refers to 2008	N/A

Other general comments to the table

The content of this Question represents a fundamental update of previously released information on designated forest functions, due to the use of 2005 NFI results.

5. How much forest area is managed for protection of soil and water and ecosystem services?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

5.1 Categories and definitions

Category	Definition
Protection of soil and water	Forest area designated or managed for protection of soil and water
...of which production of clean water (<i>sub-category</i>)	Forest area primarily designated or managed for water production, where most human uses are excluded or heavily modified to protect water quality.
...of which coastal stabilization (<i>sub-category</i>)	Forest area primarily designated or managed for coastal stabilization.
...of which desertification control (<i>sub-category</i>)	Forest area primarily designated or managed for desertification control.
...of which avalanche control (<i>sub-category</i>)	Forest area primarily designated or managed to prevent the development or impact of avalanches on human life assets or infrastructure.
...of which erosion, flood protection or reducing flood risk (<i>sub-category</i>)	Forest area primarily designated or managed for protecting communities or assets from the impacts of erosion riparian floods and landslides or for providing flood plain services.
...of which other (<i>sub-category</i>)	Forest area primarily designated or managed for other protective functions.
Ecosystem services, cultural or spiritual values	Forest area primarily designated or managed for selected ecosystem services or cultural or spiritual values.
...of which public recreation (<i>sub-category</i>)	Forest area designated or managed for public recreation.
...of which carbon storage or sequestration (<i>sub-category</i>)	Forest area designated or managed for carbon storage or sequestration.
...of which spiritual or cultural services (<i>sub-category</i>)	Forest area designated or managed for spiritual or cultural services.
...of which other (<i>sub-category</i>)	Forest area designated or managed for other ecosystem services.

5.2 National data

5.2.1 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 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 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	N/A	N/A	N/A	N/A

5.2.2 Classification and definitions

National class	Definition
Forest area legally bound for hydro-geological purposes	Defined by national law n. 3267/1923
N/A	N/A
N/A	N/A
N/A	N/A

5.2.3 Original data

<p>1985</p> <p>Forest + OWL area legally bound for hydro-geological purposes = 7 693 000 ha</p> <p>OWL total area = 1 475 100</p> <p>2005</p> <p>Forest area legally bound for hydro-geological purposes = 7 654 121</p> <p>OWL % area legally bound for hydro-geological purposes = 64.2%</p>
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5.3 Analysis and processing of national data

5.3.1 Adjustment

None needed

5.3.2 Estimation and forecasting

Data on area legally bound for hydro-geological purposes for the year 1985 refers to Forest and Other wooded land; to obtain figures for the two distinct land cover types, 2005 proportion of legally bound OWL has been applied to estimate 1985 legally bound OWL. Then this value has been subtracted from the total legally bound area (F and OWL) to obtain the legally bound Forest area for the year 1985. Figures 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.

5.3.3 Reclassification

5.4 Data

Table 5a

Categories		Forest area (1000 hectares)				
		1990	2000	2005	2010	2015
	Protection of soil and water	6973	7427	7654	7889	8124
	... of which production of clean water	N/A	N/A	N/A	N/A	N/A
	... of which coastal stabilization	N/A	N/A	N/A	N/A	N/A
	... of which desertification control	N/A	N/A	N/A	N/A	N/A
	... of which avalanche control	N/A	N/A	N/A	N/A	N/A
	... of which erosion, flood protection or reducing flood risk	N/A	N/A	N/A	N/A	N/A

	... of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A
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Other

N/A

Table 5b

Categories	Forest area (1000 hectares)				
	1990	2000	2005	2010	2015
Ecosystem services, cultural or spiritual values	N/A	N/A	N/A	N/A	N/A
...of which public recreation	N/A	N/A	N/A	N/A	N/A
...of which carbon storage or sequestration	N/A	N/A	N/A	N/A	N/A
...of which spiritual or cultural services	N/A	N/A	N/A	N/A	N/A
...of which other (please specify in comments below the table)	N/A	N/A	N/A	N/A	N/A

Tiers

Category	Tier for reported trend	Tier for status
Protection of soil and water	Tier 3	Tier 3
Ecosystem services, cultural or spiritual values	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
Protection of soil and water	Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations or legislation relating to soil and water protection. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

<ul style="list-style-type: none"> • Cultural or spiritual values • Public recreation • Spiritual or cultural services • Other 	<p>Tier 3: High reliability data derived either from high intensity sample survey or data obtained from national or state agencies responsible for regulations. Tier 2: Approaches based on low intensity or incomplete sample-based surveys or studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates. Tier 1: Other</p>	<p>Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other</p>
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5.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Protection of soil and water	Data refers to forest legally bound for general hydro-geological purposes	The trend reflects the increase of Forest area
Production of clean water	N/A	N/A
Coastal stabilization	N/A	N/A
Desertification control	N/A	N/A
Avalanche control	N/A	N/A
Erosion, flood protection or reducing flood risk	N/A	N/A
Other protective functions	N/A	N/A
Ecosystem services, cultural or spiritual values	N/A	N/A
Public recreation	N/A	N/A
Carbon storage or sequestration	N/A	N/A
Spiritual or cultural services	N/A	N/A
Other ecosystem services	N/A	N/A

Other general comments to the table

N/A

6. How much forest area is protected and designated for the conservation of biodiversity and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

6.1 Categories and definitions

Category	Definition
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.

6.2 National data

6.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	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
2	European Environment Agency – Corine Land Cover	Corine Land Cover Level 3	1990 2000	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

6.2.2 Classification and definitions

National class	Definition
Broadleaved forests	Vegetation formation composed principally of trees, including shrubs and bush, where broadleaved species predominate
Coniferous forests	Vegetation formation composed principally of trees, including shrub and bush, where coniferous species predominate
Mixed forests	Vegetation formation composed principally of trees, including shrub and bush, where broadleaved and coniferous species co-dominate
Sclerophyllous vegetation	Bushy sclerophyllous vegetation
Transitional woodland/shrub	Bushy or herbaceous vegetation with scattered trees.

6.2.3 Original data

CORINE Land Cover Classes	Forest resources under protection		
	1993*	2000**	2003**
	ha	ha	ha
Broadleaved forests	633 100	1 650 500	1 683 600
Coniferous forests	134 000	385 700	409 900
Mixed forests	104 500	255 000	273 500
Moors and heathland ***	54 500	110 400	111 300
Sclerophyllous vegetation	49 200	264 100	267 700
Transitional woodland/ shrub	154 200	319 100	325 100
Burned areas	100 000		3 600
Total	1 129 600	2 984 800	3 074 700

Source: Ministero dell' Ambiente e della Tutela del Territorio – Direzione Protezione Natura

* Data obtained overlapping in GIS Corine LC 1990 (level 3) and all Italian protected areas (1993's National Official List + Ramsar sites).

** Data obtained overlapping in GIS Corine LC 2000 (level 3) and all Italian protected areas (2000's and 2003's National Official List + Ramsar sites + Natura 2000 network's Special Protection areas and Sites of Community Importance).

*** Considered as OWL in the reclassification.

6.3 Analysis and processing of national data

6.3.1 Adjustment

None needed.

6.3.2 Estimation and forecasting

To update 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). The results of such an *ad hoc* elaboration are summarised in this table. As no new protected area has been established from 2009 onwards, this value has been repeated for 2010 and 2015.

CORINE Land Cover Classes	Years	
	2005	2008
	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

6.3.3 Reclassification

None needed.

6.4 Data

Table 6

Categories	Forest area (000 hectares)				
	1990	2000	2005	2010	2015

	Conservation of biodiversity	645	2874	3062	3265	3265
	Forest area within protected areas	645	2874	3062	3265	3265

Tiers

Category	Tier for status	Tier for reported trend
Conservation of biodiversity	Tier 3	Tier 3
Forest area within protected areas	Tier 3	Tier 3

Tier criteria

Category	Tier for status	Tier for reported trend
<ul style="list-style-type: none"> • Conservation of biodiversity • Forests within protected areas 	Tier 3: Data obtained from national or state agencies responsible for conservation and protected area or legislation relating to area protection. Tier 2: Studies that provide data for specific areas that is extrapolated through statistical analysis to national level estimates Tier 1 Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

6.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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.	As a consequence of the foundation of the Ministry of Environment (1985), at the beginning of the 90's a noticeable and quick augmentation of protected areas has started. A positive trend has characterized the first decade of the present century; while no change has happened in the last years.
Forest area within protected areas	As above	As above

Other general comments to the table

N/A

7. What is the area of forest affected by woody invasive species?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

7.1 Categories and definitions

Category	Definition
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.

7.2 National data

7.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	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	Disturbances; Invasive species	2005	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

7.2.2 Classification and definitions

National class	Definition
Invasive species	Forest where the presence of <i>Robinia pseudoacacia</i> L. or <i>Ailanthus altissima</i> Miller is detected in terms of a minimum basal area of 2 square meters
N/A	N/A
N/A	N/A
N/A	N/A

7.2.3 Original data

NFI 2005 – affected Forest (ha)	
Invasive species: <i>Robinia pseudoacacia</i> L	377186
Invasive species: <i>Ailanthus altissima</i> Miller	7142

7.3 Analysis and processing of national data

7.3.1 Adjustment

7.3.2 Estimation and forecasting

The only data available is from NFI 2005. Thus the same figures have been reported for 2005 and 2010.

7.3.3 Reclassification

7.4 Data

Table 7

Scientific name of woody invasive species	Forest area affected (000 ha)	
	2005	2010
<i>Ailanthus altissima</i> Miller	7	7
<i>Robinia pseudoacacia</i> L.	377	377
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

N/A	N/A	N/A
Total	384	384

Tiers

Category	Tier for status	Tier for reported trend
Invasive species	Tier 3	Tier 1

Tier Criteria

Category	Tier for status	Tier for reported trend
Invasive species	Tier 3: Systematic assessment in forest inventory or other survey (e.g. by conservation department) within the last 5 years) Tier 2: Systematic assessment in forest inventory or other survey (e.g. by conservation department conducted more than 5 years ago) Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

7.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Invasive species	Although most affecting species are the two reported, <i>Prunus serotina</i> Ehrh. for which data is not available at the present, is considered by some experts another species with some invasive potential. Even if the only data refers to 2005, the presence of invasive species is considered almost stable by NFI experts.	No trend available

Other general comments to the table

Tier for reported trend: not significant as data has been repeated

8. How much forest area is damaged each year?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

8.1 Categories and definitions

Category	Definition
Number of fires	Number of fires per year
Burned area	Area burned per year
Outbreaks of insects	A detectable reduction in forest health caused by a sudden increase in numbers of harmful insects.
Outbreaks of diseases	A detectable reduction in forest health caused by a sudden increase in numbers of harmful pathogens, such as bacteria, fungi, phytoplasma or virus.
Severe weather events	Damage caused severe weather events, such as snow, storm, drought, etc.

8.2 National data

8.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Forest Fires 2011, Corpo Forestale dello Stato	Number of fires and affected area	2003-2011	N/A
2	Forest Fires 2012, Corpo Forestale dello Stato (in press)	Number of fires and affected area	2012	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

8.2.2 Classification and definitions

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

8.2.3 Original data

Year	Number of fires	Affected area (ha)		
		Forest or shrubby land	Other land	Total
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

8.3 Analysis and processing of national data

8.3.1 Adjustment

none needed

8.3.2 Estimation and forecasting

none needed

8.3.3 Reclassification

none needed

8.4 Data

Table 8a

Category		000 ha, number of fires									
		2003		2004		2005		2006		2007	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	91.8	N/A	60.2	N/A	47.6	N/A	39.9	N/A	227.7	N/A
	... of which forest area burned	44.1	9697	20.9	6428	21.5	7951	16.4	5643	116.6	10639
Category		2008		2009		2010		2011		2012	
		000 ha	#	000 ha	#	000 ha	#	000 ha	#	000 ha	#
	Total land area burned	66.3	N/A	73.4	N/A	46.5	N/A	72	N/A	130.8	N/A
	... of which forest area burned	30.3	6486	31.1	5422	19.4	4884	38.4	8181	74.5	8274

Table 8b

Outbreak category	Description/name	Year(s) of latest outbreak	Area damaged (000 hectares)
Insects	Dryocosmus kuriphilus (the Chinese gall wasp which infested chestnut)	2002	N/A
Insects	Anoplophora chinensis	2007	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A
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Outbreak category
1 Insects
2 Diseases
3 Severe weather events

Tiers

Category	Tier for status	Tier for trend
Area affected by fire	Tier 3	Tier 3
<ul style="list-style-type: none"> • Insects • Diseases • Severe weather events 	N/A	N/A

Tier criteria

Category	Tier for status	Tier for reported trend
Burned area	Tier 3 : National fire monitoring routines Tier 2 : Remote sensing surveys Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other
<ul style="list-style-type: none"> • Insects • Diseases • Severe weather events 	Tier 3 : Systematic survey (e.g. via inventory or aerial damage assessment) Tier 2 : Management records Tier 1 : Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

8.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Burned area	Forest fires are the most severe injures for Italian forest resources and many efforts are made every year to take the phenomenon under control	In the period of observation, the burned area has been averagely decreasing, exception made for some problematic years
Insects	Data on affected area is not available	n.a.
Diseases	N/A	N/A
Severe weather events	N/A	N/A

Other general comments to the table
N/A

9. What is the forest area with reduced canopy cover?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

Category	Definition
Reduction in canopy cover	Forest that has undergone a reduction of canopy cover of more than 20% between the years 2000 and 2010 within the forest canopy cover range of 30-80% as detected by the MODIS VCF sensor.

Table 9

Category	Area of forest with reduced canopy cover (000 ha)
Reduction in canopy cover	N/A

Tiers

Category	Tier for reported trend
Reduction in canopy cover	N/A

Tier criteria

Category	Tier for reported trend
Reduction in canopy cover	Tier 3 : Remote sensing with ground truthing and/or Landsat imagery Tier 2 : Remote sensing using Modis (using pre-filled data provided by FAO) Tier 1 : Expert opinion

Comments

Category	Comments related to data definitions etc
Reduction in canopy cover	N/A

Other general comments

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10. What forest policy and regulatory framework exists to support implementation of sustainable forest management SFM?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

10.1 Categories and definitions

Category	Definition
Policies supporting sustainable forest management	Policies or strategies that explicitly encourage sustainable forest management.
Legislation and regulations supporting sustainable forest management	Legislation and regulations that govern and guide sustainable forest management, operations and use.

10.2 National data

10.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Programma Quadro per il Settore Forestale – PQSF (Framework Programme for the Forest Sector) http://www.reterurale.it	SFM	From 2008	N/A
2	National law n. 227 of 18th May 2001 http://www.parlamento.it/leggi/deleghe/01227dl.htm	SFM	From 2001	N/A
3	Regional Forest laws	SFM	various	There are 21 regional Laws as Regions are the final responsible for Forest management in Italy
4	N/A	N/A	N/A	N/A

10.2.2 Classification and definitions

National class	Definition
National legislation	Laws and acts in force on the whole Italian territory
Regional legislation	Laws and acts in force at regional level
N/A	N/A

N/A	N/A
-----	-----

10.2.3 Original data

Not applicable.

10.3 Data

Table 10

Category				
	National	Sub-national		
		Regional	Provincial/State	Local
Policies supporting sustainable forest management	yes	yes		
... of which, in <u>publicly</u> owned forests				
... of which, in <u>privately</u> owned forests				
Legislation and regulations supporting sustainable forest management	yes	yes		
... of which, in <u>publicly</u> owned forests				
... of which, in <u>privately</u> owned forests				

10.4 Comments

Variable / category	Comments related to data definitions etc
Policies supporting sustainable forest management	The total forest area has always been managed sustainably, according to national and sub-national legislation in force. Nevertheless, the complexity of the administrative share of forest competences among State, Regions and sub-regional institutions does not allow the assignment of Yes/No judgement in the table 10.
Legislation and regulations supporting sustainable forest management	As above

Other general comments

In Italy the competence on forest Policy and management belong to Regions (20) and Autonomous Provinces (2), while the Minister of Agricultural, Food and Forest Policies (MiPAAF) is responsible for coordination of

sub-national policies and for the enforcement of international agreements and regulations. At same time, the Ministry for the Environment and the Protection of Land and Sea is co-responsible for some forest matters: in particular for the designation and management of protected areas and general issues such as climate change and carbon stock assessment.

Regions and autonomous Provinces are mainly responsible for sustainable forest management regulated by means of local forest acts and programmes aimed at the local implementation of a national forest strategy.

The Institution responsible for forest monitoring (NFI) and control is the “Corpo Forestale dello Stato”, which is a police force eminently specialized in the prevention and repression of environmental crimes such as forest fires, food adulterations, agriculture fraud, illegal waste management and pollution.

The first National forest Plan was released in 1988, more recently (18th December 2008) a new National forest programme (Programma Quadro per il Settore Forestale – PQSF) for the coordination among different Ministries and various administrative levels (State, Regions, Provinces and Municipalities), has been approved. This decennial programme - following the provisions of the national Financial law 2007 - has been shaped around the EU Forest Action Plan and MCPFE resolutions aiming at a better implementation of international commitments.

The Programme provides guidance for local forest sector development and foresees also a national Forest Board to promote a better coordination of national and regional forest policies.

National law n. 227 of 18th May 2001 represents the general framework for actions to be implemented mainly at the local level by Regions which are responsible for sustainable forest management. The law contains the national definition of forest, and promotes activities related to forestry, forest research and information. Defines the guidelines of national, underlining the need to implement the resolutions signed along the process of MCPFE.

11. Is there a national platform that promotes stakeholder participation in forest policy development?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

11.1 Categories and definitions

Category	Definition
National stakeholder platform	A recognized procedure that a broad range of stakeholders can use to provide opinions, suggestions, analysis, recommendations and other input into the development of national forest policy.

11.2 National data

11.2.1 Data sources

	References to sources of information	Years	Additional comments
1	Programma Quadro per il Settore Forestale – PQSF (Framework Programme for the Forest Sector) http://www.reterurale.it	From 2008	N/A
2	N/A	N/A	N/A
3	N/A	N/A	N/A
4	N/A	N/A	N/A

Table 11

Is there a national platform that promotes or allows for stakeholder participation in forest policy development?	yes
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11.3 Comments

Category	Comments related to data definitions etc
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National stakeholder platform	<p>The previously mentioned National forest programme provides a Forest working party to promote a better coordination of national and local forest policies. Members of the Minister of Agricultural, Food and Forest Policies (MiPAAF), Ministry for the Environment and the Protection of Land and Sea, Corpo Forestale dello Stato and of five Regions participate in this working party, which refers to the following two stakeholder platforms:</p> <ul style="list-style-type: none">•Advisory group on Forest and wood, made up of representatives of forest owners and managers (public and private), wood industry, wood energy, Regions, professional organizations, non-profit organizations. Their role is to forward specific proposals for the national forestry policy.•Observatory on forest products and services market, co-ordinated by the National Council for Economics and Labour (CNEL), which is a Constitutional body aimed at drafting legislative proposals concerning socio-economic aspects related to productive activities.
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Other general comments

<ul style="list-style-type: none">•

12. What is the forest area intended to be in permanent forest land use and how has it changed over time?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

12.1 Categories and definitions

Category	Definition
Forest area intended to be in permanent forest land use	Forest area that is designated or expected to be retained as forest and is highly unlikely to be converted to other land use.
...of which permanent forest estate (<i>sub-category</i>)	Forest area that is designated by law or regulation to be retained as forest and may not be converted to other land use.

12.2 National data

12.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	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 and Forest Plantations area	2005	Hereinafter NFI2005
2	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest and Forest Plantations area	2015	Hereinafter NFI2015
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

12.2.2 Classification and definitions

National class	Definition
Forest area	Consistent with FRA (see table 1)
Specialised stands for wood production	high stand plantations for wood production
N/A	N/A

N/A	N/A
-----	-----

12.2.3 Original data

Management categories	2005	2015 (provisional estimate)
Category	ha	ha
Specialised stands for wood production	122252	126484
Forest area excluded stands for wood production	8636948	9170594

Source: NFI2005, NFI2015

12.3 Analysis and processing of national data

12.3.1 Adjustment

None needed.

12.3.2 Estimation and forecasting

<p>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.</p> <p>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 silvicultural rules to be observed. Only exception made for productive forestry plantations, such as poplar stands, usually located on plains and managed according to intensive silvicultural techniques.</p>

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 2010 derive from a linear interpolation between the 2005 and 2015 NFI estimates. The forest area of permanent forest estate derive from the subtraction of forest plantations area to the Forest area

Category	Year				
	2005		2010		2015
Forest area	8759		9028		9297
Forest Plantations area	122		124		126
Forest area of permanent forest estate (Forest area minus Forest Plantations area)	8637		8904		9171

12.3.3 Reclassification

12.4 Data

Table 12

Categories		Forest area 2010 (000 ha)
	Forest area intended to be in permanent forest land use	8904
	... of which permanent forest estate	8904

Tiers

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3

Permanent forest estate	Tier 3
-------------------------	--------

Tier Criteria

Category	Tier for status
Forest area intended to be in permanent forest land use	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other
Permanent forest estate	Tier 3 : National or sub-national land use plans strategy documents or other reports within the past 10 years Tier 2 : National or sub-national land use plans strategy documents or other reports within the past 20 years Tier 1 : Other

12.5 Comments

Category	Comments related to data definitions etc
Forest area intended to be in permanent forest land use	N/A
Permanent forest estate	Due to the mentioned strict legislation, all Italian forest extent is permanent; exception made for specialised plantations.

Other general comments

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13. How does your country measure and report progress towards SFM at the national level?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

13.1 Categories and definitions

Category	Definition
Forest area monitored under a national forest monitoring framework	Forest area monitored by a national monitoring framework or systems that provide measurement based periodic monitoring of forest extent and quality.
Forest reporting at national scale	National reporting of forest extent and characteristics that includes some measure of progress toward sustainable forest management.

13.2 National data

13.2.1 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 extent and quality monitored	1985	N/A
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 extent and quality monitored	2005	N/A
3	CFS-CRA, INFC2015, provisional results of photo-interpretation	Forest extent and quality monitored	2015	N/A
4	N/A	N/A	N/A	N/A

13.2.2 Classification and definitions

National class	Definition
N/A	N/A
N/A	N/A

N/A	N/A
N/A	N/A

13.3 Data

Table 13a

Category	% of total forest area	Most recent year	Check all boxes that apply					
			Continuous	Periodic	Permanent ground plots	Temporary ground plots	Aerial/remote sensing sample based	Aerial/remote sensing full coverage
Forest inventory	100	2005		yes	yes	yes	yes	
Other field assessments	N/A	N/A						
Updates to other sources	N/A	N/A						
Expert estimate	N/A	N/A						

Table 13b

Type of forest reporting used at national scale	Check boxes that apply
1 Criteria and Indicators reporting	no
2 Periodic national state of the forest report	yes
3 Other (please document)	
4 None	

Other type of forest reporting
N/A

13.4 Comments

Category	Comments
----------	----------

Sustainable Forest Management	Both the already mentioned law 227/2001 and the National Forestry Programme refer to the Criteria for Sustainable Forest Management (SFM) defined and adopted by the Pan-European Conference on the protection of forests in Europe. Italian Regions (final responsible for forest policies by Constitutional mandate) apply SFM strategies and monitor the state of their forest resources. But, apart from NFI (carried out at state level by Corpo Forestale dello Stato), no centralized and harmonized collection of SFM indicators is in force yet. Nevertheless Italy has always been submitting national SFM reports to MCPFE-Forest Europe based on NFI and other national surveys and various statistical collections.
N/A	N/A
N/A	N/A

Other general comments

--

14. What is the area of forest under a forest management plan and how is this monitored?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

14.1 Categories and definitions

Category	Definition
Forest area with management plan	Forest area that has a long-term documented management plan, aiming at defined management goals which is periodically revised
...of which for production (<i>sub-category</i>)	Forest management plan mainly focused on production
...of which for conservation (<i>sub-category</i>)	Forest management plan mainly focused on conservation
Monitoring of forest management plans	Government monitoring of forest management plan implementation conducted through field visits or audits of forest management plan performance

14.2 National data

14.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	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 functions	2005	The presence/absence of forest management plans is surveyed within the NFI
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

14.3 Data

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
-------------------------------	-----

Table 14b

Indicate which (if any) of the following are required in forest management plans in your country	
1 Soil and water management	
2 High conservation value forest delineation	
3 Social considerations community involvement	

Table 14c

Percent of area under forest management plan that is monitored annually	N/A
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Tiers

Category	Tier for status
Forest area with management plan	Tier 3
Percent of area under forest management plan that is monitored annually	Tier 3

Tier criteria

Category	Tier for status
Forest area with management plan	Tier 3 : Reports that describe national records 5 years old or less that contain long-term forest monitoring plans Tier 2 : Industry or other records indicating the presence of a long-term forest management plan Tier 1 : Other
Percent of area under forest management plan that is monitored annually	Tier 3 : Government documentation of monitoring extent Tier 2 : Reports from forest managers or other documental sources Tier 1 : Other

14.4 Comments

Category	Comments
Forest area with management plan	The reported data refers to a comprehensive category of forest under management plan. Due to the low interest of private owners in cooperative associations and consortiums (65% of Forest is private and many farms are very small), management plans are not much common. Even if forest planning is not very common yet, the trend is positive and it could improve in the future thanks to the National Forest Programme, which is envisaging this activity as a priority for the improvement of the forest sector.
N/A	N/A
N/A	N/A

Other general comments

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15. How are stakeholders involved in the management decision making for publicly owned forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

15.1 Categories and definitions

Category	Definition
Stakeholder involvement	Stakeholder involvement is defined as significant inputs into at least one aspect of forest management at the operational scale

Table 15

Please indicate the type of stakeholder involvement in forest management decision making required in your country	
1. Planning phase	yes
2. Operations phase	no
3. Review of operations	yes

Tiers

Category	Tier for status
Type of stakeholder inputs	Tier 1

Tier criteria

Category	Tier for status
Type of stakeholder inputs	Tier 3 : Government (national or sub-national) documentation of stakeholder inputs Tier 2 : Government (national or subnational) requirement but stakeholder inputs not documented Tier 1 : Other

15.2 Comments

Category	Comments
Stakeholder involvement	Due to the regionalization of the forestry competences, Regions are responsible for stakeholder consultations in case of planning and management of public forest. This usually happens for the definition of plans concerning National Parks, Protected Areas and other resources of particular common interest.
N/A	N/A
N/A	N/A

Other general comments

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16. What is the area of forest under an independently verified forest certification scheme?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

16.1 Categories and definitions

Category	Definition
FSC certification	Forest area certified under the Forest Stewardship Council certification scheme
PEFC certification	Forest area certified under the Programme for the Endorsement of Forest Certification scheme
Other international forest management certification	Forest area certified under an international forest management certification scheme with published standards and is independently verified by a third-party, excluding FSC and PEFC certification.
Certified forest area using a domestic forest management certification scheme	Area certified under a forest management certification scheme with published standards that are nationally recognized and independently verified by a thirdparty

16.2 Data

Table 16a

International forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	FSC	0	0	14.32	14.73	14.73	15.845	15.845
	PEFC	0	0	0	0	356.053	607.345	637.846
	Other	0	0	0	0	0	0	0
		2007	2008	2009	2010	2011	2012	
	FSC	18.98	33.91	48.77	66.52	52.069	52.102	
	PEFC	652.33	699.755	704.912	744.538	761.063	768.689	
	Other	0	0	0	0	0	0	

Table 16b

Domestic forest management certification		Forest area (000 ha)						
		2000	2001	2002	2003	2004	2005	2006
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0
	N/A	0	0	0	0	0	0	0

		2007	2008	2009	2010	2011	2012	
		0	0	0	0	0	0	
		0	0	0	0	0	0	
		0	0	0	0	0	0	

Tier criteria

Category	Tier for status
International forest management certification	Tier 3: International forest management scheme records maintained by the certifying organization for the reporting year Tier 2: International forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other
Domestic forest management certification	Tier 3: National registry reports for domestic forest management certification maintained by the certifying organization for the reporting year Tier 2: Domestic forest management scheme records reported by the certifying organization for a period 2 years prior to the reporting year Tier: 1 Other

Tiers

Category	Tier for status
International forest management certification	Tier 3
Domestic forest management certification	N/A

16.3 Comments

Category	Comments related to data definitions etc
Certified forest area using an international forest management certification scheme	N/A
Domestic forest management certification	N/A

Other general comments

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17. How much money do governments collect from and spend on forests?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

17.1 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest products and services. For this purpose revenue include: <ul style="list-style-type: none"> • <u>Goods</u> : roundwood; sawnwood; biomass; woodbased panels; pulp and paper and non-wood forest products. • <u>Services</u> : including concession fees and royalties, stumpage payments, public timber sales revenue taxes and charges based on forest area or yield, taxes on domestic trade and export of forest products, special levies on forestry activities and payments into forest related funds, other miscellaneous inspection, licence and administrative fees levied by forest administrations, permit and licence fees for recreation and other forest related activities.
Public expenditure on forestry	All government expenditure on forest related activities.

17.2 National data

17.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	National Institute of Agricultural Economics (INEA) – data base	Operational expenditures, Transfer Payments	2000 2005 2015	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

17.3 Data

Table 17

Category	Revenues / expenditures (000 local currency)		
	2000	2005	2010
Forest revenue	N/A	N/A	N/A
Public expenditure on forestry	1279577	1132694	1354027
	2000	2005	2010
Name of Local Currency	euro	euro	euro

17.4 Comments

Category	Comments related to data definitions etc
Forest revenue	No information available
Public expenditure on forestry	Operational expenditure: All government expenditure on public institutions uniquely engaged in the forest sector including the ones involved in research, training and marketing. Data refers to national, regional and EU funds. Transfer payments: All government expenditure on direct financial incentives paid to ONG and private institutions, enterprises communities or individuals involved in the implementation forest related activities. Data refers to national, regional and EU funds.
Other general comments	N/A

Other general comments

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18. Who owns and manages the forests and how has this changed?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

18.1 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at national scale (<i>sub-category</i>)	Forest owned by the State at the national scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
...of which owned by the state at the sub-national government scale (<i>sub-category</i>)	Forest owned by the State at the sub-national government scale or administrative units of the public administration or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private cooperatives corporations and other business entities, private, religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
...of which individuals (<i>sub-category</i>)	Forest owned by individuals and families.
...of which private business entities and institutions (<i>sub-category</i>)	Forest owned by private corporations cooperatives companies and other business entities as well as private nonprofit organizations such as NGOs nature conservation associations, and private religious and educational institutions etc.
...of which local tribal and indigenous communities (<i>sub-category</i>)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area or forest owned by communities of indigenous or tribal people The community members are coowners that share exclusive rights and duties and benefits contribute to the community development.
Unknown ownership	Forest area where ownership is unknown includes areas where ownership is unclear or disputed.
Categories related to management rights of public forests	Definition
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private companies	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities private cooperatives, private nonprofit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

18.2 National data

18.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	Ministero dell'Agricoltura e delle Foreste - ISAF. 1988. Inventario Forestale Nazionale. Sintesi metodologica e risultati.	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 ownership	2005	Hereinafter NFI2005
3	CFS-CRA, INFC2015, provisional results of photointerpretation (first phase of the NFI survey)	Forest area	2015	Hereinafter NFI2015
4	ISTAT. http://www.istat.it/Imprese/Agricoltura/index.htm	Forest ownership	2000	N/A
5	ISTAT. 1993. Statistiche Forestali. Annuario n.43, edizione 1993.	Forest ownership	1990	N/A

18.2.2 Classification and definitions

National class	Definition
Public ownership	Coincident with FRA definition
Private ownership	Coincident with FRA definition
...of which owned by individuals	Coincident with FRA definition
...of which owned by private business entities and institutions	Coincident with FRA definition

18.2.3 Original data

The table below contains forest ownership data for the year 2005 (INFC).	
Public ownership	2942

Private ownership	5817
...of which owned by individuals	5126
...of which owned by private business entities and institutions	691
TOTAL	8759

ISTAT data for 1990 and 2000

Year	Public Forest (ha)	Private Forest (ha)
1990	2933995	5448848
2000	3306382	6140424

18.3 Analysis and processing of national data

18.3.1 Adjustment

18.3.2 Estimation and forecasting

Data available at the Statistical National Institute (ISTAT) has only been used as a control of the 2005 NFI share of public/private ownership. This in consideration of the fact that 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 calculated in Question 1 obtaining the final data for table 18a.

18.3.3 Reclassification

None needed

18.4 Data

Table 18a

Categories		Forest area (1000 hectares)			
		1990	2000	2005	2010
	Public ownership	2549	2811	2942	3032
	... of which owned by the state at national scale	N/A	N/A	N/A	N/A
	... of which owned by the state at the sub-national government scale	N/A	N/A	N/A	N/A
	Private ownership	5041	5558	5817	5996
	... of which owned by individuals	4442	4898	5126	5284
	... of which owned by private business entities and institutions	599	660	691	712
	... of which owned by local, tribal and indigenous communities	0	0	0	0
	Unknown ownership	0	0	0	0
TOTAL		7590.00	8369.00	8759.00	9028.00

Tiers

Category	Tier for status	Tier for reported trend
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Public ownership	Tier 2	Tier 2
Private ownership	Tier 2	Tier 2
Unknown ownership	Tier 2	Tier 2

Tier criteria

Category	Tier for status	Tier for reported trend
Ownership	Tier 3: National forestry statistics registers of land titles or maps on land ownership or all forest area under one ownership category that is five years old or less. Tier 2: National forestry statistics registers of land titles or maps on land ownership or questionnaires that are more than five years old. Tier 1: Other	Tier 3 : Estimate based on repeated compatible tiers 3 (tier for status) Tier 2 : Estimate based on repeated compatible tier 2 or combination tier 3 and 2 or 1 (tier for status) Tier 1 : Other

Table 18b - Holder of management rights of public forests

Categories	Forest area (000 hectares)			
	1990	2000	2005	2010
Public Administration	N/A	N/A	N/A	N/A
Individuals	N/A	N/A	N/A	N/A
Private companies	N/A	N/A	N/A	N/A
Communities	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A
TOTAL	.00	.00	.00	.00

Category	Tier for reported trend	Tier for status
Public Administration	N/A	N/A
Individuals	N/A	N/A
Private companies	N/A	N/A
Communities	N/A	N/A
Other	N/A	N/A

18.5 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
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Public ownership	The major part of the public forest is owned by Municipalities (more than 60%), followed by Regions, Provinces and State	The situation is stable in the observed period
Private ownership	Individual own more about 80% of the private forest.	The situation is stable in the observed period
Unknown ownership	Not applicable	No trend observable
Management rights	No exhaustive data available	No trend observable

Other general comments to the table

As already stated, thanks to INFC 2005, the present report is more reliable than the previous Italian FRA releases. For instance, as concerns the present table, INFC ownership data refers to forest area directly assessed adopting FRA definitions.

19. How many people are directly employed in forestry?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

19.1 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment in forestry	Employment in activities related to production of goods derived from forests. This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

19.2 National data

19.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	MCPFE-UNECE/FAO 2003 Report of Europe's forest	Employment in Forestry	1990	N/A
2	Eurostat Forestry Statistics Pocketbook Edition 2007	Employment in Forestry	2000 and 2005	N/A
3	ISTAT – Labour force statistics	Employment in Forestry	2010	N/A
4	N/A	N/A	N/A	N/A

19.2.2 Classification and definitions

National class	Definition
FTE	Consistent with international (ILO) definitions
N/A	N/A
N/A	N/A
N/A	N/A

19.2.3 Original data

Forestry logging (thousands of people) FTE			
1990	2000	2005	2010

56	36	41	32
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19.3 Data

Table 19

Category		Employment (000 years FTE)			
		1990	2000	2005	2010
	Employment in forestry	56	36	41	32
	... of which female	N/A	N/A	N/A	N/A

19.4 Comments

Category	Comments related to data definitions etc	Comments on the reported trend
Employment in forestry	none	2005-2010 trend reflects the general enduring crisis

Other general comments to the table
N/A

20. What is the contribution of forestry to Gross Domestic Product (GDP)?

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

20.1 Categories and definitions

Category	Definition
Gross value added from forestry (at basic prices)	This category corresponds to the ISIC/NACE Rev. 4 activity A02 (Forestry and logging).

20.2 Data

Table 20 (Pre-filled data from UNdata/EUROSTAT)

Category	Million	Currency	Year for latest available information
Gross value added from forestry (at basic prices)	562.813	euro	2012

20.3 Comments

Category	Comments
Gross value added from forestry (at basic prices)	The change in the order of magnitude of the data 2012 compared to that reported in FRA 2010 is mainly due to the reclassification of NACE rev2 (NACE 2007). In particular, the new classification has led to the relocation of some products in the past attributed to Division 01 (agricultural crops and animal production, hunting and related services) under Division 02 (forestry and logging); in particular, the activities relating to the collection of wild mushrooms and truffles, previously included in NACE 01.12.1, and gathering berries, nuts, wild fruits, previously included in NACE 01.13.4, are now considered within the item Collection of non-wood forest products (NACE 02.30.0).

Other general comments

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21. What is forest area likely to be in the future

Documents for this question:

- [Guide for country reporting FRA 2015](#)
- [FRA 2015 Terms and Definitions](#)

21.1 Categories and definitions

Category	Definition
Government target/aspiration for forest area	Government target/aspiration for forest area for a specific year.
Forests earmarked for conversion	Forest area that is allocated/classified or scheduled to be converted into non-forest uses.

21.2 National data

21.2.1 Data sources

	References to sources of information	Variables	Years	Additional comments
1	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

21.3 Data

Table 21a

Category	Forest area (000 ha)	
	2020	2030
Government target/aspiration for forest area	N/A	N/A

Table 21b

Category	Forest area (000 ha)
	2013
Forests earmarked for conversion	N/A

21.4 Comments

Category	Comments
Government target/aspiration for forest area	N/A

Forests earmarked for conversion

N/A

Other general comments

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