



# Report

## Romania

Rome, 2020



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

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# Introduction

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## Introductory text

The basic law for forestry is the Forest Code - Law 46/2008, which defines the forestry regime, as a unitary system of technical, economic and legal regulations/norms on management planning, guarding, pest control, logging and regeneration of forests, issued by the central public authority for forestry.

The sustainable forest management has a long tradition in Romania, practically the entire national forest area being managed in terms of the forestry regime.

Compliance with the forestry regime is mandatory for all forest owners, who have also the obligation to ensure the preparation and enforcement of forest management plans (drawing up the forest management plan is mandatory for forest holdings of more than 10 hectares).

According to Forest Code, forest management or forest services should be ensured by forest districts for all forests, disregarding the ownership type, which are authorized forest management structures with certified forestry staff.

Forest conservation is one of the high priorities in the forestry legislation and the whole system of forest management planning in Romania. The tool used by foresters in order to promote the forest conservation and sustainability is the “functional zoning” system of the forests. There are two major “functional groups” according to ecological, economic and social function to be accomplished by forests.

- Group I - about 53 %: forests with special protection function: water, soil, climate and industrial damaging factor, recreation, preservation of flora and biodiversity conservation, improvement of environmental conditions etc. There are two categories in this group: when any intervention is forbidden or when cuttings are allowed if protection functions remain undisturbed.

- Group II – about 47 %: production and protection forests.

The report is based mainly on information provided by the National Forest Inventory (NFI) and the annual statistical reports of the National Institute of Statistics.

National Forest Inventories were developed in 1965, 1973, 1980 and 1984, based on information contained by the forest management plans.

A new multi-purpose NFI, based on a systematic sampling scheme, started in 2008 in order to cover all Romania’s forest vegetation, meaning the forestry fund, the woodlands outside of the forestry fund and trees outside forests.

The Romanian NFI is inspired from different NFI systems that are currently in use in the European countries and its characteristics were adapted to the size and the landscape conditions of Romania.

A pilot inventory has been conducted in 2007 and 2008 in order to verify the feasibility of the methods developed, to adapt them when necessary and ensure a proper inter-calibration of the field crews.

First cycle final results are available since the end of 2012 and the second cycle has been completed in 2018.

The National Forest Research and Development Institute Marin Drăcea, is responsible for the NFI design and implementation, field measurements, as well as results calculation and publication.

# 1 Forest extent, characteristics and changes

## 1a Extent of forest and other wooded land

### National Data

#### Data sources + type of data source eg NFI, etc

National Institute of Statistics, Statistical Yearbook 1990, 2000, 2005 and 2010

National Institute for Research and Development in Forestry „Marin Drăcea” - National Forest Inventory, for 2015 and 2020

Romanian NFI is carried out during 5 years cycles and is based on a 4x4 km systematically grid covering entire country territory. The density of grid is higher in the plain area (2x2 km) because of lower forest cover.

In the south-west corner of a 4x4 (2x2) km grid square is located a cluster of 250x250 m with 4 sample plots on the corners.

Each sample plot contains seven circles, of which 3 are larger, concentric, with areas of 200 square meters, 500 square meters and 2000 square meters. There is also a set of 2 „satellites”, each of them formed from two concentric circles of 10, respectively 3.14 square meters.

Specific different characteristics are determined in each circle.

#### National classification and definitions

All forests, lands for afforestation/reforestation, those that serve the needs of culture, production or forestry administration, ponds, beds of the creeks, other forest land for forestry destination, including non-productive land, included in forest management plans on 1st of January 1990, including further area changes according to the entry-exit operations carried out under the law, constitute, regardless of the form of ownership, **the national forestry fund**.

The area of forest on abandoned agricultural land which changed the destination from agricultural land to forest land by legal acts, becoming national forest fund, has been considered as forest.

Forest (definition valid for the data for 1990, 2000, 2005 and 2010) - land spanning at least 0.25 hectares with trees; trees should reach more than 5 meters height at maturity, in normal conditions of vegetation. It includes

- a) windbreaks;
  - b) Pinus montana alpine shrubs;
  - c) afforested pastures with canopy cover more or equal than 40 percent, calculated only for the actual area occupied by forest vegetation
  - d) plantations with forest species in the areas of protection of hydrotechnical works and land improvements made on public land owned by the state, as well as plantations with forest species on the lands administered by the Agency of Domains of the State, which fulfill the conditions stipulated concerning forest definition;
- Forest fund: All the forests, land destined for afforestation, those serving the needs of the forest cultivation, production or management, ponds, beds of the creeks and other land for forestry destination and unproductive, regardless of ownership. It includes:
- a) forests ;
  - b) land under regeneration and plantations established for forestry purposes;
  - c) land for afforestation: **degraded land** and land without trees, established by law to be afforested;
  - d) land that serve the needs of culture: nurseries, greenhouses, orchards and crops parent;
  - e) land that serve the needs of forest production: willow cultures, Christmas trees, fruit and ornamental trees and shrubs;
  - f) land that serve the needs of forest administration: land destined for ensuring game food and production of forage, land for temporary use by forestry staff;
  - g) land occupied by constructions and related courts: administrative premises, cottages, pheasant farms, trout farms, game farms, forest roads and railways, industrial areas, other technical facilities specific to forest sector; temporarily occupied land and those affected by the tasks and / or disputes, as well as the forest lands within the border corridor and the state border protection strip, and those intended to achieve objectives within the Integrated State Border Securing System;
  - h) ponds, creek beds and unproductive land included into forest management plans;

Forest vegetation outside the national forest fund = Forest vegetation located on land outside the national forest land that does not meet one or more criteria for defining forest. It includes the following categories:

- a) plantations with forest species on agricultural land;
- b) forest vegetation on pastures with canopy cover less than 40 percent;
- c) wooded grassland;
- d) plantations with forest species and trees on the protection areas of hydrotechnics and land reclamation works;
- e) trees situated along rivers and canals;

f) Urban green areas other than those defined as forests;

g) dendrologic parks and arboreta, other than those included in forests;

h) alignments of trees located along the transport and communication means

### **Original data**

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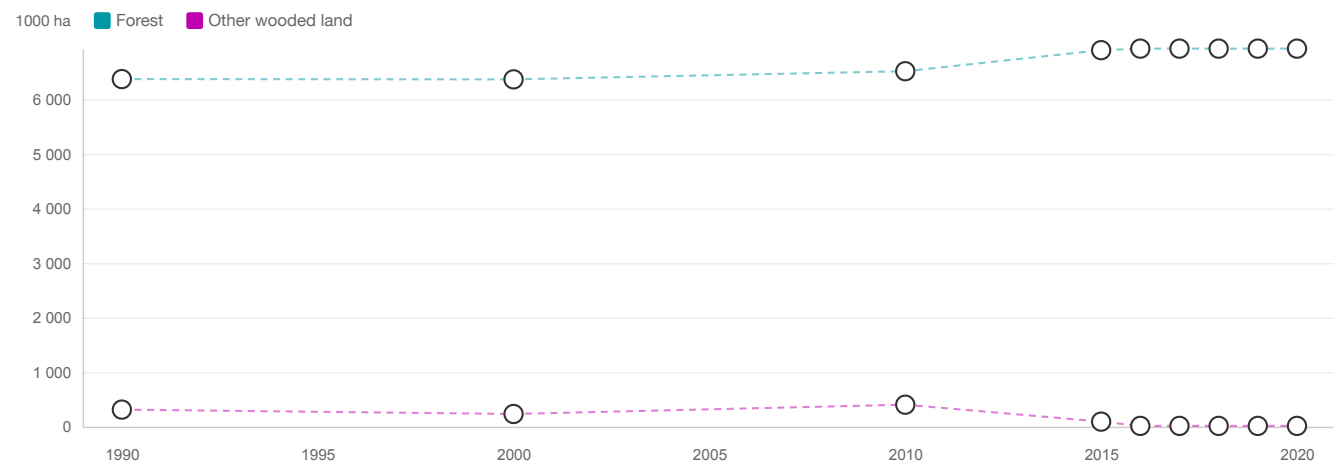
## **Analysis and processing of national data**

### **Estimation and forecasting**

The estimation for 2016-2020 is based on information supplied by the National Forest Inventory

### **Reclassification into FRA 2020 categories**

There is no reclassification



FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest (a)	6 371.00	6 366.00	6 515.00	6 900.96	6 929.05	6 929.05	6 929.05	6 929.05	6 929.05
Other wooded land (a)	314.00	234.00	404.00	93.59	15.57	15.57	15.57	15.57	15.57
Other land (c-a-b)	16 323.00	16 408.00	16 089.00	16 013.45	16 063.38	16 063.38	16 063.38	16 063.38	16 063.38
Total land area (c)	23 008.00	23 008.00	23 008.00	23 008.00	23 008.00	23 008.00	23 008.00	23 008.00	23 008.00

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

Climatic domain	% of forest area 2015	Override value
Boreal	0.00	
Temperate	100.00	
Sub-tropical	0.00	
Tropical	0.00	

Comments

The area reported as „forest” for the years 1990, 2000, 2005 and 2010 is the area matching the definition of national „forest fund” and is from the Statistical yearbook (forest inventory based on forest management plans).

Forest area reported for 2015 and 2020 is from the National Forest Inventory 2012 and 2018, matching the FAO definition

Forest area reported for 2015 has been updated according to final results of NFI

The trend for Forest and for Other wooded land after 2010 is explained by reporting data from the new National Forest Inventory 2012, 2018 (which uses FRA definition for Forest).



# 1b Forest characteristics

## National Data

### Data sources + type of data source eg NFI, etc

Data sources -

National Institute of Statistics, Statistical researches 1990, 2000, 2005 and 2010

National Institute for Research and Development in Forestry „Marin Drăcea” - National Forest Inventory, 2015 - 2020

### National classification and definitions

National Forest Inventory adopted FAO definitions

### Original data

Data from NFI for 2015

Regeneration	Area	Sampling
	(ha)	error
		(%)
Seeds, natural	4667689.84	2.416
Seeds, sowing	20300.331	22.622
Seeds, seedlings planted	467986.822	6.212
Shoots	1220760.82	4.136
Root shoots	50897.529	13.968
Cuttings, planted	28176.999	15.918
Big slip	5547.724	35.056
Pollard-shoot	5117.597	34.051
Other	434484.612	6.263
Total	6900962.27	1.041

Data from NFI for 2020

Regeneration	Area (ha)	Sampling error (%)
Seeds, natural	4979648.436	2,440
Seeds, sowing	24636.217	19,660
Seeds, seedlings planted	476271.282	6,302
Shoots	998802.386	4,241
Root shoots	50544.676	14,748

Cuttings, planted	28923.024	16,067
Big slip	5487.91	35,389
Pollard-shoot	4981.029	33,284
Other	359752.489	5,435
<b>Total</b>	<b>6929047.448</b>	1,034

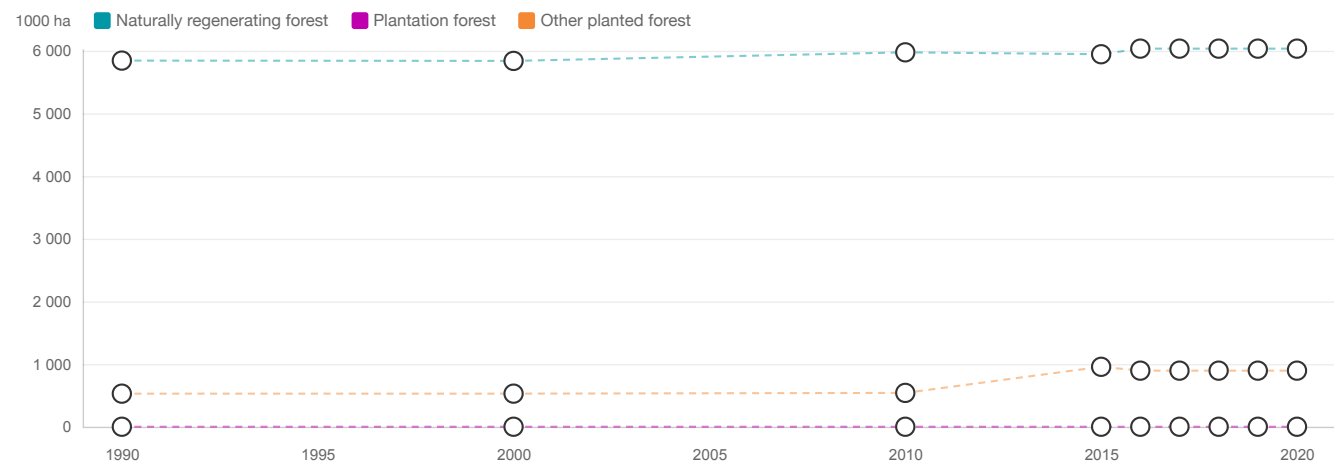
Analysis and processing of national data

Estimation and forecasting

Forecast estimated is based on data from the latest National Forest Inventory.

Reclassification into FRA 2020 categories

There is no reclassification



FRA categories	Forest area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest (a)	5 843.00	5 838.00	5 975.00	5 944.47	6 033.98	6 033.98	6 033.98	6 033.98	6 033.98
<b>Planted forest (b)</b>	<b>528.00</b>	<b>528.00</b>	<b>540.00</b>	<b>956.49</b>	<b>895.07</b>	<b>895.07</b>	<b>895.07</b>	<b>895.07</b>	<b>895.07</b>
Plantation forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
...of which introduced species	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other planted forest	528.00	528.00	540.00	956.49	895.07	895.07	895.07	895.07	895.07
<b>Total (a+b)</b>	<b>6 371.00</b>	<b>6 366.00</b>	<b>6 515.00</b>	<b>6 900.96</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>
<b>Total forest area</b>	<b>6 371.00</b>	<b>6 366.00</b>	<b>6 515.00</b>	<b>6 900.96</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>	<b>6 929.05</b>

## Comments

Figures for *Plantation forest* are not available.

# 1c Primary forest and special forest categories

## National Data

### Data sources + type of data source eg NFI, etc

The study „Criteria and indicators for sustainable forest management in Romania”( 2000), carried out by the Forest Research and Management Planning Institute, based on the functional zoning used in the forest management plans which were in force in 1999.

National Forest Inventory (2018)

### National classification and definitions

There is no national definition for Primary forests

The functional zoning used in the technical norms for management planning (compulsory in developing forest management plans) set up functional categories and management functional types assigned accordingly.

The Functional type I = Forests with special functions for nature protection for which any wood harvesting operation is forbidden by law.

Thus, there are

- Strictly protected areas in national and natural parks
- Scientific reserves
- Nature reserves
- Landscape reserves
- Nature monuments

In addition, according to Forest Code, "The virgin and quasi-virgin forests shall be strictly protected and shall be included in « the National Catalogue of Virgin and Quasi-Virgin Forests» established as an instrument of accounting and administration.

"The legal framework has been developed in this respect in order to establish the criteria and indicators for the identification of virgin and quasi-virgin forests in Romania and to set up adequate procedures to carry out necessary studies to identify such forests.

### Original data

According to the study „Criteria and indicators for sustainable forest management in Romania”( 2000), carried out by the Forest Research and Management Planning Institute, **the cumulated area of strictly protected areas** in national and natural parks, scientific reserves, nature reserves, landscape reserves and nature monuments was **127710 ha**.

According to information provided by the National Forest Inventory (2018):

Functional type	Forest area (ha)	Sampling error [%]
Functional type I	165231.02	16.64
Functional type II	1126861.76	5.15
Functional type III	319627.60	9.12
Functional type IV	894175.93	6.75
Functional type V	23711.26	31.44
Functional type VI	4399439.89	2.76
Total	6929047.45	1.03

## **Analysis and processing of national data**

### **Estimation and forecasting**

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### **Reclassification into FRA 2020 categories**

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Primary forest		127.70	127.70	127.70	165.23
Temporarily unstocked and/or recently regenerated					
Bamboos	0.00	0.00	0.00	0.00	0.00
Mangroves	0.00	0.00	0.00	0.00	0.00
Rubber wood	0.00	0.00	0.00	0.00	0.00

Comments

Data provided before has been changed, considering available data, more reliable, based on forest management plans.

Data for the years 2000 is assumed to be the same for the years 2010 and 2015 (from the study „Criteria and indicators for sustainable forest management in Romania”( 2000), carried out by the Forest Research and Management Planning Institute, based on the functional zoning included in the forest management plans, in force in 1999.

Data for 2020 is provided by the National Forest Inventory (2018), which determined forest area under the management functional type I = Forests with special functions for nature protection for which any wood harvesting operation is forbidden by law.

# 1d Annual forest expansion, deforestation and net change

## National Data

### Data sources + type of data source eg NFI, etc

National Institute of Statistics - Annual statistical reports

### National classification and definitions

There is no reclassification

### Original data

Year	Afforestation (hectares/year)
1990	3518
1991	1203
1992	412
1993	298
1994	1358
1995	942
1996	1477
1997	657
1998	562
1999	884
2000	968
2001	1148
2002	2903
2003	4447
2004	4745
2005	3456
2006	5337
2007	1976
2008	2056
2009	582
2010	447
2011	1168
2012	938
2013	535



2014	2431
2015	586
2016	611
2017	228

Year	Forest area removed from the national forest fund (ha)
2005	296.53
2006	179.66
2007	168.56
2008	121.26
2009	116.59
2010	108.02
2011	182.41
2012	166.38
2013	56.05
2014	54.12
2015	16.74
2016	21.22
2017	34.17

Analysis and processing of national data

Estimation and forecasting

Forecast estimated is based on data from the latest National Forest Inventory

Reclassification into FRA 2020 categories

There is no reclassification

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Forest expansion (a)		15.08	69.31	13.63
...of which afforestation	1.13	2.76	1.10	0.48
...of which natural expansion				
Deforestation (b)		0.18	0.11	0.02
Forest area net change (a-b)	-0.50	14.90	77.19	5.62

### Comments

Deforestation (b) for 2000-2010 stands for the average of the years 2005-2009

Deforestation (b) for 2010-2015 stands for the average of the years 2010-2014

Deforestation (b) for 2015-2020 stands for the average of the years 2015-2017

# 1e Annual reforestation

## National Data

### Data sources + type of data source eg NFI, etc

National Institute of Statistics - Annual statistical reports

### National classification and definitions

Reforestation = Natural regeneration or re-establishment of forest through planting and/or deliberate seeding on land already in forest land use

### Original data

Year	Reforestation (hectares/year)
1990	25489
1991	15832
1992	12350
1993	10346
1994	14744
1995	13117
1996	12727
1997	10641
1998	9946
1999	10829
2000	12424
2001	12441
2002	13545
2003	10325
2004	9355
2005	10931
2006	10196
2007	8740
2008	21122
2009	22270
2010	23277
2011	23832
2012	24706
2013	25750

2014	27074
2015	28163
2016	27845
2017	27789

## Analysis and processing of national data

### Estimation and forecasting

The extrapolation for 2015 - 2020 is based on the average of the areas from the years 2015 - 2017.

### Reclassification into FRA 2020 categories

The value of the area for 1990 - 2000 stands for the average of the areas from the years 1990 -1999

The value of the area for 2000 - 2010 stands for the average of the areas from the years 2000 - 2009

The value of the area for 2010 - 2015 stands for the average of the areas from the years 2010 -2014

The value of the area for 2015 - 2020 stands for the period 2015 - 2019, as previously

FRA categories	Area (1000 ha/year)			
	1990-2000	2000-2010	2010-2015	2015-2020
Reforestation	13.60	13.13	24.93	27.93

Comments

## 1f Other land with tree cover

### National Data

#### Data sources + type of data source eg NFI, etc

National Forest Inventory

#### National classification and definitions

Land with trees that do not meet the conditions to be included in *Forest* or *Other wooded land* categories.

Includes: trees on land corresponding to *Forest* and *Other wooded land* definitions, but less than 0.5 ha or less than 20 m wide, scattered trees on pastures and permanent grasslands, parks and gardens around buildings, lines along streets, roads, railways, rivers, watercourses and canals, forest protection belts with a width of less than 20 m or an area of less than 0.5 ha.

#### Original data

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### Analysis and processing of national data

#### Estimation and forecasting

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#### Reclassification into FRA 2020 categories

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FRA categories	Area (1000 ha)				
	1990	2000	2010	2015	2020
Palms (a)	0.00	0.00	0.00	0.00	0.00
Tree orchards (b)					
Agroforestry (c)					
Trees in urban settings (d)					
Other (specify in comments) (e)					
Total (a+b+c+d+e)	0.00	0.00	0.00	0.00	0.00
Other land area	16 323.00	16 408.00	16 089.00	16 013.45	16 063.38

Comments

## 2 Forest growing stock, biomass and carbon

### 2a Growing stock

#### National Data

**Data sources + type of data source eg NFI, etc**

National Forest Inventory (NFI)

Data for the years 1990, 2000, 2005 and 2010 is estimated based on **NFI1985** (which was **stand inventory**), using the relationship between forest area and the growing stock by unit of area (211.5 m3 per hectare), adjusting the growing stock with the forest area variation.

Growing stock in 2015 was adjusted according to final results of the NFI 2012

**National classification and definitions**

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**Original data**

Categories	Forest area and Growing stock (National Forest Inventory 1985)	
Growing stock (mill. m³)	1341.4	
Forest area (1000 ha)	6343.1	

Year 1985		
Scientific name	Common name	Growing stock million m³
<i>Fagus sylvatica</i>	Beech	472.6656
<i>Picea abies</i>	Norway spruce	386.6146
<i>Abies alba</i>	Silver fir	123.6708
<i>Quercus petraea</i>	Sessile oak	102.598
<i>Quercus robur</i>	Oak	22.4466
<i>Tilia sp.</i>	Lime	19.1406
<i>Populus sp.</i>	Poplars	16.6992
<i>Robinia pseudacacia</i>	Black locust	10.8410
<i>Pinus sylvestris</i>	Red pine	7.2248
<i>Fraxinus excelsior</i>	Ash	5.8320
<i>Others</i>		173.6670
Total		1341.4002

Category	Growing stock (National Forest Inventory 2012)	
Growing stock (mill. m3)	2221.6	

Category	Growing stock
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	(National Forest Inventory 2018)
Growing stock (mill. m3)	2354,8

National Forest Inventory 2012

Regeneration	Growing stock	
	m³	m³/ha
Seeds, natural	1709044916.447	366.144
Seeds, sowing	6349824.908	312.794
Seeds, seedlings planted	135930522.880	290.458
Shoots	299722293.599	245.521
Suckers/Root shoots	9631757.911	189.238
Cuttings, planted	5133648.037	182.193
Big slip	1144878.139	206.369
Pollard-shoot	660045.653	128.976
Other	53975581.831	124.229
Total	2221593469.405	321.925

National Forest Inventory 2018

Regeneration	Growing stock	
	m³	m³/ha
Seeds, natural	1853393469.290	372.194
Seeds, sowing	7808564.490	316.955
Seeds, seedlings planted	162275045.980	340.720
Shoots	238133260.890	238.419
Suckers/Root shoots	9823061.770	194.344
Cuttings, planted	7467447.180	258.183
Big slip	1398837.520	254.894
Pollard-shoot	646627.590	129.818
Other	73843552.080	205.262
Total	2354789866.780	339.843

Analysis and processing of national data

Estimation and forecasting

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**Reclassification into FRA 2020 categories**

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FRA categories	Growing stock m³/ha (over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				339.65	348.36	348.36	348.36	348.36	348.36
Planted forest				211.74	282.42	282.42	282.42	282.42	282.42
...of which plantation forest									
...of which other planted forest									
Forest	211.51	211.50	211.50	321.93	339.84	339.84	339.84	339.84	339.84
Other wooded land				62.09	50.42	50.42	50.42	50.42	50.42

FRA categories	Total growing stock (million m³ over bark)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				2 019.06	2 102.00	2 102.00	2 102.00	2 102.00	2 102.00
Planted forest				202.53	252.79	252.79	252.79	252.79	252.79
...of which plantation forest									
...of which other planted forest									
Forest	1 347.50	1 346.40	1 377.90	2 221.63	2 354.79	2 354.79	2 354.79	2 354.79	2 354.79
Other wooded land				5.81	0.79	0.79	0.79	0.79	0.79

## Comments

## 2b Growing stock composition

### National Data

Data sources + type of data source eg NFI, etc

NFI 2018

National classification and definitions

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Original data

NFI 1985, 2012, 2018

NFI 2018

Rank	Scientific name	Common name	Growing stock (million m³)
#1 Ranked in terms of volume	<i>Fagus sylvatica</i>	<i>Beech</i>	<b>881.51</b>
#2 Ranked in terms of volume	<i>Picea abies</i>	<i>Norway spruce</i>	<b>560.16</b>
#3 Ranked in terms of volume	<i>Abies alba</i>	<i>Silver fir</i>	<b>160.07</b>
#4 Ranked in terms of volume	<i>Quercus petraea</i>	<i>Sessile oak</i>	<b>176.31</b>
#5 Ranked in terms of volume	<i>Quercus robur</i>	<i>Oak</i>	<b>113.57</b>
#6 Ranked in terms of volume	<i>Tilia sp.</i>	<i>Lime</i>	<b>68.10</b>
#7 Ranked in terms of volume	<i>Populus sp.</i>	<i>Poplars</i>	<b>42.55</b>
#8 Ranked in terms of volume	<i>Robinia pseudacacia</i>	<i>Black locust</i>	<b>29.01</b>
#9 Ranked in terms of volume	<i>Pinus sylvestris</i>	<i>Red pine</i>	<b>23.66</b>
#10 Ranked in terms of volume	<i>Fraxinus excelsior</i>	<i>Ash</i>	<b>22.91</b>
TOTAL			<i>2077.85</i>

NFI 1985

Species		Area (thousand ha) (NFI 1985)	%
<i>Carpinus betulus</i>	<i>Hornbeam</i>	<i>374</i>	5.90
<i>Quercus cerris</i>	<i>Turkey oak</i>	<i>154</i>	2.43
<i>Quercus frainetto</i>	<i>Hungarian oak</i>	<i>114</i>	1.80
<i>Populus tremula</i>	<i>Aspen</i>	<i>90</i>	1.42
TOTAL forest area		6343.1	

NFI 2018

Naturalness	Growing stock m3	Sampling error SE [%]
Native species > 99%, Introduced species < 1 %	2303687278.000	2.731
Native species > 50%, Introduced species < 50%	31941878.154	16.093
Native species < 50%, Introduced species > 50%	5526551.209	28.100
Native species < 1%, Introduced species > 99%	13634158.936	15.293
Total	2354789866.781	1.787

Analysis and processing of national data

Estimation and forecasting

Species		Area (thousand ha)	% in total forest area (1985)	Growing stock (million m³)			
				1990	2000	2005	2010
<i>Carpinus betulus</i>	<i>Hornbeam</i>	374	5.90	79.45	79.39	79.70	81.24
<i>Quercus cerris</i>	<i>Turkey oak</i>	154	2.43	32.69	32.69	32.82	33.45
<i>Quercus frainetto</i>	<i>Hungarian oak</i>	114	1.80	24.20	24.20	24.29	24.76
<i>Populus tremula</i>	<i>Aspen</i>	90	1.42	19.10	19.10	19.18	19.55

The volume of introduced tree species when the proportion is over 99 % is 13.63 million m³

The volume of introduced tree species when the proportion is over 50 % is 5.53 million m³

A rough estimation of the growing stock of introduced tree species is the sum of the two above categories, having in view that introduced tree species have been also when their proportion is less than 50 %

Reclassification into FRA 2020 categories

Total volume for Introduced species for 2020 is based on NFI 2018

The estimated volume of introduced tree species considered for 2020 is the volume of the trees when the proportion of introduced tree species is over 99 % (13.63 million m³), cumulated with the volume of the trees when the proportion of introduced tree species is over 50 % (5.53 million m³).

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
#1 Ranked in terms of volume	Fagus sylvatica	Beech	474.80	474.40	485.50	852.54	881.51
#2 Ranked in terms of volume	Picea abies	Norway spruce	388.40	388.10	397.10	528.47	560.16
#3 Ranked in terms of volume	Quercus petraea	Sessile oak	103.10	103.00	105.40	166.33	176.31
#4 Ranked in terms of volume	Abies alba	Silver fir	124.20	124.10	127.00	151.01	160.07
#5 Ranked in terms of volume	Carpinus betulus	Hornbeam	79.45	79.39	81.24	107.15	113.57
#6 Ranked in terms of volume	Quercus cerris	Turkey oak	32.69	32.69	33.45	64.25	68.10
#7 Ranked in terms of volume	Quercus robur	Oak	22.50	22.50	23.10	40.15	42.55
#8 Ranked in terms of volume	Robinia pseudacacia	Black locust	10.90	10.90	11.10	27.37	29.01
#9 Ranked in terms of volume	Quercus frainetto	Hungarian oak	24.20	24.20	24.76	22.33	23.66
#10 Ranked in terms of volume	Populus tremula	Aspen	19.10	19.10	19.55	21.61	22.91
Remaining native tree species			68.16	68.02	69.69	240.38	257.78
Total volume of native tree species			1 347.50	1 346.40	1 377.89	2 221.59	2 335.63
Introduced tree species							
#1 Ranked in terms of volume							
#2 Ranked in terms of volume							
#3 Ranked in terms of volume							
#4 Ranked in terms of volume							
#5 Ranked in terms of volume							
Remaining introduced tree species							19.16

FRA categories	Scientific name	Common name	Growing stock in forest (million m³ over bark)				
			1990	2000	2010	2015	2020
Native tree species							
Total volume of introduced tree species			–	–	–	–	19.16
Total growing stock			1 347.50	1 346.40	1 377.89	2 221.59	2 354.79

Comments

Carpinus betulus, Quercus cerris, Quercus frainetto and Populus tremula were not in the ranking for the years before reference year 2015.

Their volume has been reconstituted as percentage in the total growing stock, based on the proportion of these species in the total forest area.

2c Biomass stock

National Data

Data sources + type of data source eg NFI, etc

Insert the percentages of Growing stock by IPCC forest type for each of the FRA forest categories									
IPCC forest types	FRA forest categories								
	Naturally regenerating forest	Plantation forest	Other planted forest						
	% of Growing stock								
Broadleaved	61%		7%						
Pine									
Other coniferous	28%		4%						
	89%	0%	11%	Must add up to 100%					
Insert Carbon fraction used by country (IPCC default = 0.47)									
Carbon Fraction	47%								
Biomass conversion and expansion factors (BCEF)									
Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved				0.80	0.80	0.80	0.80	0.80	0.80
Pine				0.70	0.70	0.70	0.70	0.70	0.70
Other coniferous				0.70	0.70	0.70	0.70	0.70	0.70
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									



Pine									
Other coniferous									
Weighted BCEF									
Naturally regenerating forest				0.68	0.68	0.68	0.68	0.68	0.68
Plantation forest									
Other planted forest									
Root-shoot ratios									
Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved				0.24	0.24	0.24	0.24	0.24	0.24
Pine				0.20	0.20	0.20	0.20	0.20	0.20
Other coniferous				0.20	0.20	0.20	0.20	0.20	0.20
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									
Pine									
Other coniferous									
Weighted RS ratio									
Naturally regenerating forest				0.20	0.20	0.20	0.20	0.20	0.20
Plantation forest									
Other planted forest									
Above-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				232.32	238.28	238.28	238.28	238.28	238.28

Plantation forest									
Other planted forest									
Total	0.00	0.00	0.00	200.12	207.50	207.50	207.50	207.50	207.50
Below-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				47.02	48.23	48.23	48.23	48.23	48.23
Plantation forest									
Other planted forest									
Total	0.00	0.00	0.00	40.50	42.00	42.00	42.00	42.00	42.00

National classification and definitions

-

Original data

Insert the percentages of Growing stock by IPCC forest type for each of the FRA forest categories									
IPCC forest types	FRA forest categories								
	Naturally regenerating forest	Plantation forest	Other planted forest						
	% of Growing stock								
Broadleaved	64%								
Pine									
Other coniferous			37%						
	64%	0%	37%	Must add up to 100%					
Insert Carbon fraction used by country (IPCC default = 0.47)									
Carbon Fraction	47%								
Biomass conversion and expansion factors (BCEF)									

Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved					0.80	0.80	0.80	0.80	0.80
Pine					0.70	0.70	0.70	0.70	0.70
Other coniferous					0.70	0.70	0.70	0.70	0.70
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved					0.80	0.80	0.80	0.80	0.80
Pine					0.70	0.70	0.70	0.70	0.70
Other coniferous					0.70	0.70	0.70	0.70	0.70
Weighted BCEF									
Naturally regenerating forest					0.51	0.51	0.51	0.51	0.51
Plantation forest									
Other planted forest					0.26	0.26	0.26	0.26	0.26
Root-shoot ratios									
Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved					0.24	0.24	0.24	0.24	0.24
Pine					0.20	0.20	0.20	0.20	0.20
Other coniferous					0.20	0.20	0.20	0.20	0.20
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved					0.46	0.46	0.46	0.46	0.46
Pine					0.29	0.29	0.29	0.29	0.29

Other coniferous					0.29	0.29	0.29	0.29	0.29
Weighted RS ratio									
Naturally regenerating forest					0.15	0.15	0.15	0.15	0.15
Plantation forest									
Other planted forest					0.11	0.11	0.11	0.11	0.11
Above-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest					176.97	176.97	176.97	176.97	176.97
Plantation forest									
Other planted forest					52.44	52.44	52.44	52.44	52.44
Total	0.00	0.00	0.00	0.00	160.88	160.88	160.88	160.88	160.88
Below-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest					26.97	26.97	26.97	26.97	26.97
Plantation forest									
Other planted forest					5.55	5.55	5.55	5.55	5.55
Total	0.00	0.00	0.00	0.00	24.20	24.20	24.20	24.20	24.20

Analysis and processing of national data

Estimation and forecasting

Insert the percentages of Growing stock by IPCC forest type for each of the FRA forest categories								
IPCC forest types	FRA forest categories							
	Naturally regenerating forest	Plantation forest	Other planted forest					
	% of Growing stock							
Broadleaved	61%		7%					

Pine									
Other coniferous	28%		4%						
	89%	0%	11%	Must add up to 100%					
Insert Carbon fraction used by country (IPCC default = 0.47)									
Carbon Fraction	47%								
Biomass conversion and expansion factors (BCEF)									
Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved				0.80	0.80	0.80	0.80	0.80	0.80
Pine				0.70	0.70	0.70	0.70	0.70	0.70
Other coniferous				0.70	0.70	0.70	0.70	0.70	0.70
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									
Pine									
Other coniferous									
Weighted BCEF									
Naturally regenerating forest				0.68	0.68	0.68	0.68	0.68	0.68
Plantation forest									
Other planted forest									
Root-shoot ratios									

Naturally regenerating forest	1990	2000	2010	2015	2016	2017	2018	2019	2020
Broadleaved				0.24	0.24	0.24	0.24	0.24	0.24
Pine				0.20	0.20	0.20	0.20	0.20	0.20
Other coniferous				0.20	0.20	0.20	0.20	0.20	0.20
Plantation forest									
Broadleaved									
Pine									
Other coniferous									
Other planted forest									
Broadleaved									
Pine									
Other coniferous									
Weighted RS ratio									
Naturally regenerating forest				0.20	0.20	0.20	0.20	0.20	0.20
Plantation forest									
Other planted forest									
Above-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				232.32	238.28	238.28	238.28	238.28	238.28
Plantation forest									
Other planted forest									
Total	0.00	0.00	0.00	200.12	207.50	207.50	207.50	207.50	207.50
Below-ground biomass (t/ha)									
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Naturally regenerating forest				47.02	48.23	48.23	48.23	48.23	48.23
Plantation forest									

Other planted forest									
Total	0.00	0.00	0.00	40.50	42.00	42.00	42.00	42.00	42.00

Reclassification into FRA 2020 categories

-

FRA categories	Forest biomass (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass	108.00	107.00	107.00	200.12	207.50	207.50	207.50	207.50	207.50
Below-ground biomass	20.00	20.00	20.00	40.50	42.00	42.00	42.00	42.00	42.00
Dead wood									

Comments

The „Biomass calculator” has been used for the years 2016-2020.

Data in requested format is not available for previous years.

Forest biomass (tonnes/ha) has been calculated based on data from FRA 2015 report.



## 2d Carbon stock

### National Data

#### Data sources + type of data source eg NFI, etc

National Institute for Research and Development in Forestry „Marin Drăcea” - National Forest Inventory (NFI)

National Institute for Research and Development in Forestry „Marin Drăcea” Project (2013) concerning tha variable soil carbon

#### National classification and definitions

-

#### Original data

Variable	Default value for Carbon in litter	2015		2020	
		Area (thousand ha)	Carbon in litter (thousand metric tonnes)	Area (thousand ha)	Carbon in litter (thousand metric tonnes)
TOTAL, of which		6900962.26		6929047.45	
Coniferous	24	1796095.06	43106281.51	1777214.24	42653141.83
Broadleaved	22	5104867.20	112307078.42	5151833.21	113340330.55
TOTAL carbon (thousand metric tonnes)			155413359.93		155993472.39
Forest carbon in litter (tonnes/ha)			22.52053467		22.51297505

### Analysis and processing of national data

#### Estimation and forecasting

Regarding the carbon in litter, due to transition climate of Romania, temperate continental, with influences of altitude (Carpathian Mountains) and latitude (5°), an average has been used for the default values for litter and dead wood

Thus, the default values for litter used are 24 for coniferous (located mostly on mountain and hilly areas) and 22 for broadleaved.

Variable	1990	2000	2010	2015	2020
Carbon in litter (million metric tonnes)	144.02	143.76	147.31	155.413	155.993
Area (million ha)	6.371	6.366	6.515	6.901	6.929
Forest carbon in litter (tonnes/ha)	22.606	22.582	22.611	22.521	22.513

Climate region	SOC REF from the table 5.10 in the Guide for country reporting for FRA 2015	Soils proportion %	Forest soil area (1000 hectares) by climate region, by years & Carbon content (Million metric tonnes)					
			1990	2000	2005	2010	2015	2020
Forest area (000 ha)			6371.000	6366.000	6391.000	6511.000	6900.962	6929.047
Cold temperate, moist	95	83	502.353	501.959	503.930	513.392	544.141	546.355
Cold temperate, moist	115	5	36.633	36.605	36.748	37.438	39.681	39.842
Cold temperate, moist	130	2	16.565	16.552	16.617	16.929	17.943	18.016
Warm temperate, dry	19	1	1.210	1.210	1.214	1.237	1.311	1.317
Warm temperate, dry	38	9	21.789	21.772	21.857	22.268	23.601	23.697

TOTAL SOIL CARBON STOCK		100	578.551	578.096	580.367	591.264	626.676	629.227
			1990	2000	2005	2010	2015	2020
TOTAL SOIL CARBON STOCK (tonnes/ha)			90.810	90.810	90.810	90.810	90.810	90.810

Concerning the soil carbon, an analysis of the soil types spreading and their weight in Romania has been done. Climate influence and relief conditions were considered using the aridity indexes Emm. De Martonne and Palfay. This determined the choice of the SOC<sub>REF</sub> from the table 5.10 in the GUIDELINES FOR COUNTRY REPORTING TO FRA 2010/ Guide for country reporting for FRA 2015, both for “Cold temperate, moist” and “Warm temperate, dry” climatic regions, for appropriate soil categories.

Reclassification into FRA 2020 categories

-

FRA categories	Forest carbon (tonnes/ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Carbon in above-ground biomass	50.00	50.00	50.00	94.06	97.52	97.52	97.52	97.52	97.52
Carbon in below-ground biomass	10.00	10.00	10.00	19.04	19.74	19.74	19.74	19.74	19.74
Carbon in dead wood				9.23	9.23	9.23	9.23	9.23	9.23
Carbon in litter	22.61	22.58	22.61	22.52	22.51	22.51	22.51	22.51	22.51
Soil carbon	90.81	90.81	90.81	90.81	90.81	90.81	90.81	90.81	90.81

Soil depth (cm) used for soil carbon estimates	30.00
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Comments

The „Biomass calculator” has been used for the years 2016-2020.

Data in requested format is not available for previous years and Forest carbon (tonnes/ha) has been calculated based on data from FRA 2015 report

Carbon in litter for 2015 has been recalculated due to the modification of the area of Forests

Carbon in dead wood has been provided by NFI 2018 and has been estimated to be the same in 2015, as the forest area does not differ significantly, being determined in similar conditions.

### 3 Forest designation and management

#### 3a Designated management objective

##### National Data

**Data sources + type of data source eg NFI, etc**

Data provided is from the study carried out by the Forest Research and Management Institute in 2000, based on the functional zoning included in the forest management plans, in force in 1999

For the following years as there is no updated information, the area is calculated applying the percentage of the different protection categories from the study, to the forest area from respective years.

**National classification and definitions**

-

**Original data**

National class	Area 1000 hectares /Year					
	1990	2000	2005	2010	2015	2020
Protection	2185	3323	3406	3472	3360	3970
Production	4186	3043	2985	3043	3501	2959
Total forest land	6371	6366	6391	6515	6861	6929

#### Analysis and processing of national data

**Estimation and forecasting**

1000 ha

National categories for protective function	1990	2000 <sup>1</sup>	2015
Protection of water	699.3	1 052.0	1070
Protection of soils	939.6	1 433.0	1420
Protection against climatic and industrial damaging factors	109.3	166.5	170
Social function	240.4	364.3	380
Scientific and biodiversity conservation	196.7	308.0	320
...of which protected areas (subord. to biodiv. conserv.)	(87.4)	(127.7)	130
<b>Total forest land with protective functions</b>	<b>2185.3</b>	<b>3323.6</b>	<b>3360.0</b>

<sup>1</sup> Data provided is from the study carried out by the Forest Research and Management Institute in 2000, based on the functional zoning included in the forest management plans, in force in 1999

For the following years , as there is no updated information, the area is calculated applying the percentage of the different protection categories from the study, to the forest area from respective years.

**Reclassification into FRA 2020 categories**

-

Primary designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production (a)	4 186.00	3 043.00	3 043.00	3 501.00	2 959.00
Protection of soil and water (b)	1 639.00	2 478.00	2 543.00	2 490.00	2 515.00
Conservation of biodiversity (c)	197.00	308.00	317.00	318.00	321.00
Social Services (d)	0.00	0.00	0.00	0.00	0.00
Multiple use (e)	0.00	0.00	0.00	0.00	0.00
Other (specify in comments) (f)	349.00	537.00	612.00	552.00	1 134.00
None/unknown (g)	0.00	0.00	0.00	39.96	0.05
Total forest area	6 371.00	6 366.00	6 515.00	6 900.96	6 929.05

Total area with designated management objective

FRA 2020 categories	Forest area (1000 ha)				
	1990	2000	2010	2015	2020
Production					
Protection of soil and water					
Conservation of biodiversity					
Social Services					
Other (specify in comments)					

Comments

Other: Protection against climatic and industrial damaging factors, social function (green belts protecting human settlements).

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

#### National Data

**Data sources + type of data source eg NFI, etc**

Data concerning Forest area within protected areasfor 1990 is estimated and represents the sum of the strictly protected forest area from the National and Natural Parks declared by a Ministerial Order in 1990. Forest area from other protected areas - natural reserves or nature monuments (declared according to legislation in force at that time) - is not included in this figure but is assumed that is not significant.

Further legislation has been issued later on.

Data for the years 2000, 2005 and 2010 is assessed from digital maps in a project.

Data reported for 2015 represents the total forest area included in the national network of protected areas and Natura 2000 Network (SCIs and SPAs). Data was obtained by GIS analysing within the project „Study for characterization and geospatial database building forRomanian state owned forests located in Sites of Community Interest (SCIs), Special Protected Areas (SPAs) and natural reserves [Lorentȃ A., Apostol B. (coord.), 2013].

**National classification and definitions**

-

**Original data**

-

#### Analysis and processing of national data

**Estimation and forecasting**

-

**Reclassification into FRA 2020 categories**

-

FRA categories	Area (1000 ha)								
	1990	2000	2010	2015	2016	2017	2018	2019	2020
Forest area within protected areas	142.00	153.00	1 746.00	2 606.00	2 606.00	2 606.00	2 606.00	2 606.00	2 606.00
Forest area with long-term forest management plan	6 371.00	5 984.04	5 653.00	5 587.52	5 587.52	5 587.52	5 587.52	5 587.52	5 587.52
...of which in protected areas									

## Comments

Further to processing digital maps, accurate information on forest included in protected areas will be provided.

Data reported for 2015 represents the total forest area included in the national network of protected areas and Natura 2000 Network (SCIs and SPAs). Data was obtained by GIS analysis within the project „Study for characterization and geospatial database building for Romanian state owned forests located in Sites of Community Interest (SCIs), Special Protected Areas (SPAs) and natural reserves [Lorenț A., Apostol B. (coord.), 2013]. Natura 2000.

As there is no recent available information on the total forest area within protected areas (there are many different categories of protected areas which overlap), the area of protected areas was considered the same for the years that followed.

The decrease of the forest area with long-term forest management plans could be explained by the modification of the forest ownership, progressively after 1990 (restitution of forests to former owners – communes, cities, municipalities, individuals and legal persons) and the big number of small properties (under 5 hectares)..

Another slight modification is in the year 2015, when Forest Code has been changed, stipulating that preparation of forest management plans is mandatory for forest properties larger than 10 ha. Before, the preparation of forest management plans was mandatory for all forests, disregarding the size of the property.

## 4 Forest ownership and management rights

### 4a Forest ownership

#### National Data

Data sources + type of data source eg NFI, etc

National institute of Statistics

National classification and definitions

-

#### Original data

OWNERSHIP TYPE	FOREST AREA (1000 ha)			
	1990	2000	2010	2015
Public ownership, total	6371	6010	4363	4249
- of which State owned forests	6371	6010	3339	3203
- of which owned by local communities			1024	1046
Private ownership, total		356	2152	2306
- of which owned by individuals		356		
- of which owned by legal persons				
- of which owned by individuals and legal persons			2079	2215
- of which owned by local communities			73	91
TOTAL	6371	6366	6515	6555

#### Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-



FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Private ownership (a)	0.00	356.00	2 152.00	2 306.00
...of which owned by individuals	0.00	356.00		
...of which owned by private business entities and institutions	0.00	0.00		
...of which owned by local, tribal and indigenous communities	0.00	0.00		
Public ownership (b)	6 371.00	6 010.00	4 363.00	4 249.00
Unknown/other (specify in comments) (c)	0.00	0.00	0.00	345.96
Total forest area	6 371.00	6 366.00	6 515.00	6 900.96

## Comments

Unknown/other - the ownership structure is provided by the National Institute of Statistics in annual statistic researches and refers to area of the national forestry fund, which is different from the area of the forest in the NFI.

Private ownership in statistic reports is not divided by owners type (individuals and legal persons)

## 4b Holder of management rights of public forests

### National Data

Data sources + type of data source eg NFI, etc

National institute of Statistics

National classification and definitions

-

Original data

-

### Analysis and processing of national data

Estimation and forecasting

-

Reclassification into FRA 2020 categories

-

FRA categories	Forest area (1000 ha)			
	1990	2000	2010	2015
Public Administration (a)	6 371.00	6 010.00	4 363.00	4 249.00
Individuals (b)	0.00	0.00	0.00	0.00
Private business entities and institutions (c)	0.00	0.00	0.00	0.00
Local, tribal and indigenous communities (d)	0.00	0.00	0.00	0.00
Unknown/other (specify in comments) (e)	0.00	0.00	0.00	0.00
Total public ownership	6 371.00	6 010.00	4 363.00	4 249.00

Comments

## 5 Forest disturbances

### 5a Disturbances

#### National Data

**Data sources + type of data source eg NFI, etc**

Managerial records from forest administrators.

**National classification and definitions**

-

**Original data**

-

#### Analysis and processing of national data

**Estimation and forecasting**

-

**Reclassification into FRA 2020 categories**

-

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Insects (a)	1 291.00					1 322.00					78.00							37.68
Diseases (b)																		
Severe weather events (c)	1 365.00					230.90					1.40							199.61
Other (specify in comments) (d)																		
<b>Total (a+b+c+d)</b>	<b>2 656.00</b>	–	–	–	–	<b>1 552.90</b>	–	–	–	–	<b>79.40</b>	–	–	–	–	–	–	<b>237.29</b>
Total forest area	<b>6 366.00</b>	–	–	–	–	–	–	–	–	–	<b>6 515.00</b>	–	–	–	–	<b>6 900.96</b>	<b>6 929.05</b>	<b>6 929.05</b>

## Comments

Figures for 2010 are provided by National Forest Inventory, using a different system of data collection than in previous reporting years.

Figures for 2017 are based on managerial reports.

Previous figures

## 5b Area affected by fire

### National Data

#### Data sources + type of data source eg NFI, etc

Ministry of Waters and Forests - reports from National Administration of Forests Romsilva and from Forest Guards

#### National classification and definitions

Forest area reported represents area affected by various types fires (litter, canopy, underground). The vast majority of forest fires are only litter fires.

#### Original data

-

### Analysis and processing of national data

#### Estimation and forecasting

-

#### Reclassification into FRA 2020 categories

-

FRA categories	Area (1000 ha)																	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total land area affected by fire																		28.36
...of which on forest	3.61	1.00	3.54	0.76	0.12	0.16	0.95	2.53	0.37	0.97	0.21	2.20	6.62	0.42	0.22	1.67	0.68	2.46

Comments

5c Degraded forest

Does your country monitor area of degraded forest		Yes
If "yes"	What is the national definition of "Degraded forest"?	There is no official national definition for "degraded forest". Forests with low production capacity, with affected structure concerning the crown density of the stand, composition of species and no satisfactory fulfillment of the protection functions are included in this category.
	Describe the monitoring process and results	Monitoring is ensured by forest management plans, resulting in regeneration cuttings followed by substitution or restoration of stands, subject of statistical reports

Comments



## 6 Forest policy and legislation

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

#### National Data

**Data sources + type of data source** eg NFI, etc

Legislation in force

**National classification and definitions**

No classification needed

**Original data**

-

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

## Comments

There isn't a special procedure dedicated for the development of national forest policy. The legal procedure is followed in general for public consultation concerning the development of the legislation and in addition the main stakeholders - NGO-s (professional, environmental, owners and administrators associations), academic/research entities etc. are consulted, according to the contents of the legal initiative.

The Integrated Information System for Wood Tracking (SUMAL), established in 2008 and further developed in 2014, as an integrated information system involving forest managers, economic operators and forest authorities.

Wood tracking is carried out from harvesting and transportation to end users, through a special regime documents in a unique numbering system, allowing precise identification of wood sourcing.

Appropriate supporting software is used by all wood holders in order to ensure analytical management of wood by assortments and recording of wood inputs and outputs. Quantities of wood that are not declared in this system are considered without legal origin and may be seized.

Technical support is provided by the territorial forest authority.

SUMAL has been improved by further legislation and consequently, the control system and real-time tracking of shipments of timber, known as „Radar of Forests”, are now possible using software operated on line from tablet computers and smartphones.

SUMAL has several soft components and applications embedded, being distributed / downloaded for free and dedicated to:

- forestry managers certifying timber harvesting site (SUMAL Forest District component)

- market operators involved in wood logging, transport, processing, store and trading wood products (SUMAL Agent component; software for real-time tracking and control of the origin of wood materials and to ensure their traceability, with applications such as Agent Mobile type - "Wood Tracking" (WT);

- control bodies in charge and having legal powers to control the movement of timber, collecting, processing and analysing information, managed by the forest authority (SUMAL-Control and Inspector applications such as Mobile/Desktop type "Inspector wood Tracking" (IWT).

## 6b Area of permanent forest estate

### National Data

#### Data sources + type of data source eg NFI, etc

National Institute of Statistics, Statistical researches 1990, 2000, 2005 and 2010

National Institute for Research and Development in Forestry „Marin Drăcea” - National Forest Inventory, 2015 - 2020

#### National classification and definitions

-

#### Original data

-

FRA 2020 categories	Forest area (1000 ha)					
	Applicable?	1990	2000	2010	2015	2020
Area of permanent forest estate	Yes	6 371.00	6 366.00	6 515.00	6 900.96	6 929.05

Comments

According to the Forestry Code, **the reduction of the surface of the national forest fund is prohibited**, except for the lands necessary for the achievement of the objectives of national interest or strategic interest for the national security, according to the law.

Land may also be permanently removed from the national forest fund for certain purposes provided for by the forestry code, only on condition that it is compensated, without reducing the area of the forest fund and anticipating the payment of the necessary financial obligations.

## 7 Employment, education and NWFP

### 7a Employment in forestry and logging

#### National Data

**Data sources + type of data source eg NFI, etc**

National Institute of Statistics

**National classification and definitions**

The average number of employees includes persons employed under a contract of employment / service relationship for a fixed or indefinite period (including seasonal workers, manager or administrator) whose work contract / service report has not been suspended in the reference year.

The average number of employees represents a simple arithmetic average resulting from the sum of the daily number of employees (excluding those whose work contract / service report has been suspended), including weekly rest, legal holidays and other non-working days divided by the total number of calendar days.

In the daily number of employees taken into account the average number are included persons with an individual contract of employment / work relationship for a definite or indefinite period (including seasonal workers, manager or administrator), whose work contract / service report has not been suspended .

In the daily number of employees taken into account the average number includes employees who are temporarily unable to work (sick leave) while they are paid

**Original data**

Number of of employees in forestry and logging

Year	Number of of employees		
	Total	Female	Male
1990	107346	n/a	n/a
1991	98791	n/a	n/a
1992	92709	n/a	n/a
1993	88380	n/a	n/a
1994	91341	n/a	n/a
1995	83072	n/a	n/a
1996	78164	n/a	n/a
1997	69277	n/a	n/a
1998	60922	n/a	n/a
1999	53498	n/a	n/a
2000	49615	n/a	n/a
2001	46796	n/a	n/a
2002	42991	n/a	n/a
2003	37849	n/a	n/a
2004	37072	n/a	n/a
2005	37566	n/a	n/a

2006	35939	n/a	n/a
2007	34375	n/a	n/a
2008	32443	4144	28299
2009	31382	3963	27419
2010	28551	3554	24997
2011	30048	3498	26550
2012	31019	3581	27438
2013	31218	3710	27508
2014	32713	4300	28413
2015	32443	4112	28331
2016	33095	4084	29011
2017	34186	4654	29532

FRA 2020 categories	Full-time equivalents (1000 FTE)											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Employment in forestry and logging	103.07			49.97			29.99	3.67	26.32	32.75	4.16	28.59
...of which silviculture and other forestry activities												
...of which logging												
...of which gathering of non wood forest products												
...of which support services to forestry												

Comments

Average for 1990 is from the years 1990 and 1991

## 7b Graduation of students in forest-related education

### National Data

Data sources + type of data source eg NFI, etc

National Institute of Statistics - statistic researches

National classification and definitions

-

#### Original data

Study year	Number of graduates
Profile : Forestry	Master's degree
1990/1991	111
1991/1992	91
1992/1993	82
1993/1994	119
1994/1995	316
1995/1996	277
1996/1997	253
1997/1998	257
1998/1999	308
1999/2000	160
2000/2001	312
2001/2002	300
2002/2003	400
2003/2004	447
2004/2005	532
2005/2006	576
2006/2007	849
2007/2008	598
2008/2009	1478
2009/2010	842
2010/2011	677
2011/2012	580



<b>2012/2013</b>	577
<b>2013/2014</b>	516
<b>2014/2015</b>	557
<b>2015/2016</b>	473
<b>2016/2017</b>	453

<b>Study year</b>	<b>Number of graduates</b>
<b>SProfile : Forestry</b>	technician certificate / diploma
<b>1993/1994</b>	133
<b>1994/1995</b>	166
<b>1995/1996</b>	182
<b>1996/1997</b>	321
<b>1997/1998</b>	460
<b>1998/1999</b>	488
<b>1999/2000</b>	726
<b>2000/2001</b>	894
<b>2001/2002</b>	1100
<b>2002/2003</b>	911
<b>2003/2004</b>	844
<b>2004/2005</b>	620
<b>2005/2006</b>	590
<b>2006/2007</b>	443
<b>2007/2008</b>	178
<b>2008/2009</b>	164
<b>2009/2010</b>	385
<b>2010/2011</b>	458
<b>2011/2012</b>	392
<b>2012/2013</b>	315
<b>2013/2014</b>	441
<b>2014/2015</b>	330
<b>2015/2016</b>	336

2016/2017	394
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FRA 2020 categories	Number of graduated students											
	1990			2000			2010			2015		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Doctoral degree										8.00		
Master's degree	94.00			260.00			999.00			515.00		
Bachelor's degree												
Technician certificate / diploma	150.00			703.00			336.00			369.00		
Total												

Comments

Master's degree - figures for 1990 stands for the average of 1991+1992+1993

Technician certificate / diploma - figures for 1990 stands for the average of 1994+1995

## 7c Non wood forest products removals and value 2015

### National Data

**Data sources + type of data source eg NFI, etc**

National Institute of Statistics, Statistical Reasearch, 2015

**National classification and definitions**

-

**Original data**

-

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#1	Berries	Rubus idaeus; Vaccinium myrtillus, Rubus caesius.	3 482	tonnes	12 760	1 Food
#2	Forest and ornamental seedlings	Forest species	15 166	thousand pieces	10 705	6 Ornamental plants
#3	Game products	Sus scrofa, Capreolus capreolus, Cervus elaphus, Lepus europaeus, Phasianus colchicus		~	5 903	10 Hides skins and trophies
#4	Medicinal plants	Sambucus nigra, Tilia sp., Crataegus monogyna, Betula pendula, Vaccinium myrtillus (leaves), Urtica dioica, Hypericum perforatum, Achillea millefolium, Rubus idaeus, Plantago sp., Robinia pseudacacia, Equisetum arvense, Primula officinalis, Matricaria chamomilla, Hypericum perforatum etc	660	tonnes	3 053	3 Raw material for medicine and aromatic products
#5	Christmas trees	abies sp., picea sp.	100	thousand pieces	1 134	8 Other plant products
#6	Forest seeds	forest species	7	tonnes	560	8 Other plant products

	Name of NWFP product	Key species	Quantity	Unit	Value (1000 local currency)	NWFP category
#7	Mushrooms	Boletus edulis, Armillaria melea, Cantharellus cibarius	543	tonnes	592	1 Food
#8	Osier	Salix sp.	45	tonnes	16	8 Other plant products
#9	Honey		731	kg	10	11 Wild honey and bee wax
#10						
All other plant products						
All other animal products						
Total					34 733	

Name of currency	Romanian LEI (RON)
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Comments

8 Sustainable Development Goal 15

8a Sustainable Development Goal 15

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

Indicator	Percent							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area as proportion of total land area 2015	27.67	28.32	29.99	30.12	30.12	30.12	30.12	30.12

Name of agency responsible	
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SDG Indicator 15.2.1 Progress towards sustainable forest management

Sub-Indicator 1	Percent						
	2000-2010	2010-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Forest area annual net change rate	0.23	1.16	0.41	0.00	0.00	0.00	0.00

Name of agency responsible	
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Sub-Indicator 2	Forest biomass (tonnes/ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Above-ground biomass stock in forest	107.00	107.00	200.12	207.50	207.50	207.50	207.50	207.50

Name of agency responsible	
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Sub-Indicator 3	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area located within legally established protected areas	2.22	25.30	37.76	37.76	37.76	37.76	37.76	37.76

Name of agency responsible	
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Sub-Indicator 4	Percent (2015 forest area baseline)							
	2000	2010	2015	2016	2017	2018	2019	2020
Proportion of forest area under long-term forest management plan	86.71	81.92	80.97	80.97	80.97	80.97	80.97	80.97

Name of agency responsible	
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Sub-Indicator 5	Forest area (1000 ha)							
	2000	2010	2015	2016	2017	2018	2019	2020
Forest area under independently verified forest management certification schemes	0.00	914.68	2 523.40	2 523.71	2 630.43	2 728.31	—	—