

GLOBAL FOREST RESOURCES ASSESSMENT 2015

COUNTRY REPORT

Croatia

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

Republic of Croatia has a long-standing tradition of sustainable forest management that dates back over 250 years. Already in 1769, the first Forest Order recognized that forest management should be based on the principles of sustainability. As a result, today Republic of Croatia has some of the most extensive, healthy and naturally self-sustaining forests in Europe. Republic of Croatia enjoys rich biodiversity concentrated on its relatively small territory. 4500 plant species and subspecies, 260 autochthonous tree species and more than 100 forest plant communities exist on approximately 2.7 millions hectares of forest and other wooded land.

In Republic of Croatia, forests cover almost half of the land territory. Their value has been recognized a long time ago. Most of this valuable resource is owned by the State, and managed in a “close to nature” practice with the objective of natural regeneration. Furthermore, clear cuts are prohibited by the law, which helps to maintain the forest stands in optimal condition and provides continuous cover over large areas. Consequently, all state forests, managed by state owned enterprise, are accredited with the prestigious Forest Stewardship Council’s certificate (FSC).

Republic of Croatia has made an ambitious plan for having 100% of forests under sustainable forest management. Fulfilling of this goal will be accomplished through development of Forest Management Plans for private forests in the country.

Republic of Croatia has developed sustainable forest management financing mechanism in the form of “green tax”. It is based on the charging of Public Used Non-timber Forests Services to all economic entities in the State. Funds collected in this way are strictly designated and used only for implementation of activities supporting and executing sustainable forest management.

The first National Forest Inventory in Croatia is in its final stage. All the field work, measurements and most of the analysis have been done. Currently data verification is ongoing. The verification will be done by the Expert Committee established by the Ministry of Agriculture. Therefore, these data were not used in FRA 2015 reporting. Main data source for reported data are General Forest Management Plans of the Republic of Croatia and the Croatian Forests Ltd. database.

Forests in Republic of Croatia have not been changed substantially in the last hundred years, but this does not mean they have not been used by men. On the contrary, many areas have been and will continue to be, used sustainably for wood production or as hunting reserves, which not only bring in economic gains, but also provide jobs and additional income to thousands of people.

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 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993. | Forest and other wooded land | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |

| | | | | |
|---|---|--|-------------|---|
| 2 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1996. | Forest and other wooded land | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006. | Forest and other wooded land | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd. | Forest and other wooded land | 2010,2012 | Validated management plans for management units |
| 5 | WISDOM report of Republic of Croatia, 2008 (FAO TCP project: Development of sustainable charcoal industry in the Republic of Croatia (2006.-2008.)) | Other land with tree cover | 2008 | N/A |
| 6 | Croatian Forests Ltd. | Forest management activities | 1988 - 1992 | Registry of performed forest management activities for the years 1988-1992. |
| 7 | Croatian Forests Ltd. | Forest management activities | 1996 - 2005 | Registry of performed forest management activities for the years 1996-2005. |
| 8 | Croatian Forests Ltd. | Forest management activities – biological renewal of forests | 2006, 2007 | Registry of performed forest management activities for the years 2006 and 2007. |
| 9 | Croatian Forests Ltd. | Area afforested or reforested with introduced species | 1998 - 2007 | Registry of performed afforestation and reforestation activities with seedlings of introduced species, for the years 1998-2007. |

1.2.2 Classification and definitions

| National class | Definition |
|--|--|
| Forest (stocked forest land) | Forest is defined as the land covered by forest trees formed as forest stand over an area larger than 10 ars (1 ar = 100 square meters). Separate forest tree groups over an area up to 10 ars, forest nurseries, wind barrier belts, tree avenues, and parks in settlements are not considered forests. |
| Other forest land (unstocked forest land) | Wooded land is defined as the land upon which forest is grown, or, owing to its natural characteristics and management conditions, is assigned as the most appropriate for forest cultivation. It consists of the following: a) Productive wooded land without vegetation cover, b) Non-productive wooded land without vegetation, c) Barren wooded land |
| a) Productive wooded land without tree cover | Clearings, stony ground, etc. |
| b) Non-productive wooded land without tree cover | Fire lanes, light tracts along roads wider than three meters, landings, mountain meadows, etc. |

| | |
|----------------------------|---|
| c) Barren wooded land | Forest roads wider than three meters, streams, canals, swamps, straight karst, areas under developments, gravel pits, quarries, etc. |
| Other land | All land which is not classified as forest or other wooded land. |
| Other land with tree cover | Separate forest tree groups over an area up to 10 ars, forest nurseries, wind barrier belts, tree avenues, and parks in settlements are not considered forests. |
| Inland water bodies | The water bodies including the main rivers, lakes and water reservoirs. |

1.2.3 Original data

| <p>Note</p> <p>The information below refers to table 1.2.2</p> <p>Forest area</p> | | | |
|--|-----------------|-----------|-----------|
| National classes | Area (hectares) | | |
| | 1986. | 1996. | 2006. |
| FOREST (stocked forest land) | 2 061 509 | 2 078 289 | 2 402 782 |
| a) high forest, plantation and coppice | 1 825 343 | 1 748 343 | 1 889 638 |
| b) scrubland | 236 166 | 329 946 | 513 144 |
| Other forest land (unstocked forest land) | 396 139 | 407 322 | 285 904 |
| a) Productive forest land without tree cover | 315 166 | 331 334 | 208 465 |
| b) Non-productive forest land without tree cover | 16 961 | 14 618 | 32 952 |
| c) Barren wooded land | 64 012 | 61 370 | 44 487 |
| Other land | 3 138 352 | 3 110 389 | 2 907 314 |
| Other land with tree cover | n.a. | n.a. | 205 065 |

| | | | |
|---------------------|-----------|-----------|-----------|
| Inland water bodies | 63 000 | 63 000 | 63 000 |
| Total for country: | 5 659 000 | 5 659 000 | 5 659 000 |

Since the original documents report only on forests, other forest land and other land with tree cover, without including other categories, the data for the latter have been obtained by deducting the areas of forests, other forest land and other land with tree cover from the total land area (FAOSTAT).

Data on forest and OWL area needed for 2015 forecast:

| National category | Area (ha) | |
|--|-----------|---------|
| | 2010 | 2012 |
| Stocked forest land (high forests, plantations and coppices) | 1879105 | 1879835 |
| Forest infrastructure (roads etc.) as a part of no-flora, non-productive and barren land | 41409 | 41318 |
| Total Forest | 1920514 | 1921153 |
| Other wooded land (scrubland, maquies, garigues) | 558520 | 562805 |

Due to adjustment with FAOSTAT, other land, inland water and total area are corrected.

1.3 Analysis and processing of national data

1.3.1 Adjustment

Forest area

Calibration is not necessary, because the original documents report on forests, other forest land and other land with tree cover, and do not encompass the category of other land, and continental water bodies. If the category other land were taken from other sources, these data would not be compatible.

Forest expansion, reforestation

Calibration is not necessary.

1.3.2 Estimation and forecasting

| National classes | Area (hectares) | | | | | | |
|--|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1986 | 1996 | 2006 | 1990 | 2000 | 2005 | 2010 |
| FOREST (stocked forest land) | 2 061 509 | 2 078 289 | 2 402 782 | 2 078 478 | 2 249 115 | 2 334 433 | 2 419 751 |
| a) high forest, plantation and coppice | 1 825 343 | 1 748 343 | 1 889 638 | 1 801 820 | 1 833 967 | 1 850 041 | 1 866 115 |
| b) scrubland | 236 166 | 329 946 | 513 144 | 276 658 | 415 148 | 484 392 | 553 636 |
| Other forest land (unstocked forest land) | 396 139 | 407 322 | 285 904 | 396 192 | 341 075 | 313 516 | 285 957 |
| a) Productive forest land without tree cover | 315 166 | 331 334 | 208 465 | 316 999 | 263 648 | 236 973 | 210 298 |
| b) Non-productive forest land without tree cover | 16 961 | 14 618 | 32 952 | 16 713 | 24 709 | 28 706 | 32 704 |
| c) Barren wooded land | 64 012 | 61 370 | 44 487 | 62 480 | 52 718 | 47 837 | 42 955 |
| Other land | 3 138 352 | 3 110 389 | 2 907 314 | 3 121 330 | 3 005 811 | 2 948 051 | 2 890 292 |

| | | | | | | | |
|----------------------------|--------|--------|---------|--------|--------|---------|---------|
| Other land with tree cover | n.a. | n.a. | 205,065 | n.a. | n.a. | 205 065 | 205 065 |
| Inland water bodies | 63 000 | 63 000 | 63 000 | 63 000 | 63 000 | 63 000 | 63 000 |

By using the method of linear interpolation, we obtained the assessment for the years 1990, 2000 and 2005 while the forecasting for 2010 was made by using the method of extrapolation.

Data from valid Forest Management Plans for 2010 and 2012 were used for estimation of Forest and OWL in 2015. Since it was possible to extract from the database all land categories according to FRA 29015 definition of Forest, reclassification was not necessary.

| National category | Area (ha) | | |
|--|-----------|---------|---------|
| | 2010 | 2012 | 2015 |
| Stocked forest land (high forests, plantations and coppices) | 1879105 | 1879835 | 1880930 |
| Forest infrastructure (roads, breaks etc.) | 41409 | 41318 | 41181 |
| Total forest | 1920514 | 1921153 | 1922111 |
| Other wooded land (scrubland, maquies, garigues) | 558520 | 562805 | 569233 |

Forest expansion, reforestation

Estimation and forecasting are not necessary.

1.3.3 Reclassification

| Forest area | |
|-------------------------|--|
| National classes | Percentage of a National class belonging to a FRA Class |
| | |

| | Forest | Other wooded land | Other land | Other land with tree cover | TOTAL |
|--|---------------|--------------------------|-------------------|-----------------------------------|--------------|
| FOREST (stocked forest land) | | | | | |
| a) High forest | 100 | | | | 100 |
| b) Plantation | 100 | | | | 100 |
| c) Coppice | 100 | | | | 100 |
| d) Scrubland | | 100 | | | 100 |
| Other forest land (unstocked forest land) | | | | | |
| a) Productive forest land without tree cover | | | 100 | | 100 |
| b) Non-productive forest land without tree cover | 100 | | | | 100 |
| c) Barren wooded land | 50 | | 50 | | 100 |
| Other land | | | 100 | | |
| Other land with tree cover | | | | 100 | |

The category Productive forest land without tree cover (clearings, stony ground etc.) includes areas which are within existing forests and on the forest edges. In Croatia category Productive forest land without tree cover does not include areas in process of regeneration, and it is not expected to become forest within a short period. Regarding that those areas are not overgrown with tree species, we cannot classify them as Forest or Other wooded land (regarding to FRA classes). We have classified them as Other land, but in the future, a part of those areas will be included in afforestation.

Category Non productive forest land without tree cover refers to small and narrow open areas which are within existing forests. The forests have been on that land earlier and later trees were cut so the present condition is without trees. If we leave that land without control (to nature succession), there would be a forest as soon as possible. The questions about “Mountain meadows” are not significant for us. Croatia is unique country in south-east Europe which doesn't have mountains higher than 2000 meters. The highest mountain in Croatia is 1848 meters. Considering the distribution of vegetation in high mountains in Croatia we assume that the meadows are irrelevant (small patches within existing forests) and they are classified as forest.

Category Barren wooded lands have to be separated into Forest and Other land. The Forest includes forest roads wider than three meters, and also some swamps, streams and canals where will be developed forest vegetation. And the quarries after closing down and recultivation with forest trees belong to the forest, too.

Forest expansion, reforestation

Reclassification is not necessary.

1.4 Data

Table 1a

| Categories | | Area (000 hectares) | | | | |
|---|------------------------------|---------------------|---------|---------|---------|---------|
| | | 1990 | 2000 | 2005 | 2010 | 2015 |
|  | Forest | 1850 | 1885 | 1903 | 1920 | 1922 |
|  | Other wooded land | 277 | 415 | 484 | 554 | 569 |
|  | Other land | 3469 | 3296 | 3209 | 3122 | 3105 |
|  | ... of which with tree cover | N/A | N/A | 205 | 205 | 205 |
|  | Inland water bodies | 63 | 63 | 63 | 63 | 63 |
| | TOTAL | 5659.00 | 5659.00 | 5659.00 | 5659.00 | 5659.00 |

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 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|  | ... of which afforestation | 1.59 | 0.79 | 0.54 | 0.93 | N/A | 0.01 | 0.02 | 0.06 |
|  | ... of which natural expansion of forest | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|  | Deforestation | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | |
|---|----------------------------|-----|------|------|------|-----|------|-----|-----|
|  | ... of which human induced | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|  | Reforestation | N/A | 6.42 | 6.85 | 7.51 | N/A | N/A | N/A | N/A |
|  | ... of which artificial | N/A | 0.72 | 0.62 | 1.46 | N/A | 0.32 | 0.4 | 0.1 |

Tiers

| Category | Tier for status | Tier for reported trend |
|-------------------|-----------------|-------------------------|
| Forest | Tier 2 | Tier 2 |
| Other wooded land | Tier 2 | Tier 2 |
| Forest expansion | Tier 1 | Tier 1 |
| Deforestation | Tier 1 | 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 | This category includes high forest, plantation and coppice. Since the national forest definition sets minimum forest area of 0.1 ha, we estimate that the total area of such small groves of 0.1-0.5 ha is less than 0.5%, and it is negligible in the total reported forest area. | N/A |

| | | |
|----------------------------|--|--|
| Other wooded land | This category includes scrubland (maquia, garigue, scrubs and shrub). Forest management in these areas is composed mainly of conducting protecting measures to prevent their further degradation and stimulate their succession to forests. | Quick development of other wooded land area happened for two reasons: 1. State forests are now almost 100% managed or in some managing stage (like measuring all the trees with diameter more than 10 cm at breast height etc.). Because of that, now we have more accurate data and it shows that there are less clearings and more stocked forest land. 2. Unmanaged forest land used to be exposed to cattle and browse as the local population used it as grazing land. Now the population in the karst area is reduced, so there are fewer cattle too, and the wooded land area is expanding. |
| Other land | Includes all other areas that are not included in Forests or Other wooded land. | N/A |
| Other land with tree cover | Includes orchards, olive orchards, green areas with tree cover, agricultural areas with important part of trees and bushes | N/A |
| Inland water bodies | N/A | N/A |
| Forest expansion | The unstocked forest land and plantations of fast-growing species, afforested with forest reproductive material, are used for the annual forest establishment. All the areas afforested with introduced species within unstocked forest land and plantations of fast-growing species are displayed in "...of which of introduced species" sub-category. There are no data available for years 1988-1992. Data are not available. | N/A |
| Deforestation | N/A | N/A |
| Reforestation | N/A | N/A |

Other general comments to the table

N/A

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 | Croatian Forest Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993. | Cultures and plantations, Naturally regenerated forests | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forest Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1996. | Cultures and plantations, Naturally regenerated forests | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |

| | | | | |
|---|--|---|------|---|
| 3 | Croatian Forest Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006. | Cultures and plantations, Naturally regenerated forests | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Ministry of Culture, Directorate for Nature Protection: - Register of protected natural values of Republic of Croatia - Reports from Public Institutions National Parks in Republic of Croatia | Primary forests types in protected areas of Republic of Croatia | 2009 | N/A |

2.2.2 Classification and definitions

| National class | Definition |
|------------------------------|---|
| Naturally regenerated forest | Forests emerged by restoration after fertilizing and selection fellings. They compose of trees mostly emerged by natural restoration (from seeds or from stumps), and by their origin they can be high forest forms (from seeds) or low forest forms (coppice – stump forests). |
| Primary forest types | Same as FRA definition for Primary forest. |
| Forest cultures | Artificially raised stands without use of agrotechnical measures. |
| Forest plantations | Artificially raised fast growing willow and poplar stands with use of agrotechnical measures (land cultivating, e.g. hilling up, crumbling, spreading manure). |

2.2.3 Original data

| National classes | Forest area (ha) | | |
|---------------------------------------|------------------|-----------|-----------|
| | 1986 | 1996 | 2006 |
| 1.Naturally regenerated forest | 1 777 915 | 1 777 292 | 1 870 378 |
| <i>1.1. High forests</i> | 1 113 234 | 1 259 253 | 1 321 094 |
| 1.1.1. Stocked forest land | 1 084 343 | 1 227 541 | 1 283 561 |
| a) primary forest | 6 730 | 6 730 | 6 730 |
| b) other naturally regenerated forest | 1 077 613 | 1 220 811 | 1 276 831 |

| | | | |
|---|------------------|------------------|------------------|
| 1.1.2. Unstocked area that according to FRA counts into forest area | 28 891 | 31 712 | 37 533 |
| <i>1.2. Low forests (coppice)</i> | 664 681 | 518 039 | 549 284 |
| 1.2.1. Stocked forest land | 647 053 | 504 901 | 533 829 |
| 1.2.2. Unstocked area that according to FRA counts into forest area | 17 628 | 13 138 | 15 455 |
| 2. Planted forests | 96 395 | 16 354 | 74 456 |
| <i>2.1. Cultures and plantations</i> | 96 395 | 16 354 | 74 456 |
| 2.1.1. Stocked forest land | 93 947 | 15 901 | 72 248 |
| a) planted with autochthonous species | 66 536 | 0 | 46 054 |
| b) planted with introduced species | 27 411 | 15 901 | 26 194 |
| 2.1.2. Unstocked area that according to FRA counts into forest area | 2 448 | 453 | 2 208 |
| TOTAL: | 1 874 310 | 1 793 646 | 1 944 834 |

The data in the Planted forests category vary a lot for referent years. The reason for that is of administrative nature, because the definitions for some categories have been changing, as it is explained in the comments table.

Data on forest area needed for 2015 forecast:

| Category | Forest area (ha) | |
|----------|------------------|------|
| | 2010 | 2012 |
| | | |

| | | |
|------------------------------------|---------|---------|
| Primary forest | 6730 | 6730 |
| Other naturally regenerated forest | 1840231 | 1840245 |
| ...with introduced species | 56530 | 56742 |
| Planted forest | 73553 | 74178 |
| ... with introduced species | 26922 | 26892 |
| Ukupno | 1920514 | 1921153 |

2.3 Analysis and processing of national data

2.3.1 Adjustment

Calibration is not necessary.

2.3.2 Estimation and forecasting

Original reclassification was made as in Question1, where only areas that correspond to FRA definitions were included in national classes according to purpose. After that, estimation was made using linear trends in the following way: Regarding that data for planted forests in 1996 are inadequate because they do not include all categories of planted forests, interpolation was made for 1996 on the basis of the data for planted forests in 1986 and 2006. After that, interpolation was made for all categories according to national classes in the tables.

| National classes | Forest area (ha) | | |
|---------------------------------------|------------------|-----------|-----------|
| | 1986 | 1996 | 2006 |
| 1. Naturally regenerated forest | 1 777 915 | 1 708 221 | 1 870 378 |
| a) primary forest | 6 730 | 6 730 | 6 730 |
| b) other naturally regenerated forest | 1 771 185 | 1 701 491 | 1 863 648 |
| 2. Planted forests | 96 395 | 85 425 | 74 456 |

| | | | |
|---------------------------------------|-----------|-----------|-----------|
| a) planted with autochthonous species | 68 288 | 57 875 | 47 461 |
| b) planted with introduced species | 28 107 | 27 551 | 26 995 |
| TOTAL: | 1 874 310 | 1 793 646 | 1 944 834 |

For other naturally regenerated forest with introduced species, the data from 2006 were used, and the same percent share of those forests in other naturally regenerated forest was applied for the other years.

| National classes | Forest area (ha) | | | |
|---------------------------------------|------------------|-----------|-----------|-----------|
| | 1990 | 2000 | 2005 | 2010 |
| 1. Naturally regenerated forest | 1 757 766 | 1 803 997 | 1 827 113 | 1 850 229 |
| a) primary forest | 6 730 | 6 730 | 6 730 | 6 730 |
| b) other naturally regenerated forest | 1 751 036 | 1 797 267 | 1 820 383 | 1 843 499 |
| b1)... of which of introduced species | 53 608 | 55 024 | 55 731 | 56 439 |
| 2. Planted forests | 92 007 | 81 038 | 75 552 | 70 067 |
| a) planted with autochthonous species | 64 122 | 53 709 | 48 502 | 43 295 |
| b) planted with introduced species | 27 885 | 27 329 | 27 050 | 26 772 |
| TOTAL: | 1 849 773 | 1 885 035 | 1 902 665 | 1 920 296 |

Forecast for 2015.

| Category | Forest area (ha) | | |
|------------------------------------|------------------|---------|---------|
| | 2010 | 2012 | 2015 |
| Primary forest | 6730 | 6730 | 6730 |
| Other naturally regenerated forest | 1840231 | 1840245 | 1840266 |
| ...with introduced species | 56530 | 56742 | 57060 |
| Planted forest | 73553 | 74178 | 75115 |
| ... with introduced species | 26922 | 26892 | 26847 |
| Ukupno | 1920514 | 1921153 | 1922111 |

2.3.3 Reclassification

Regarding that FRA categories for forest characteristics are easily recognized from the national classes, reclassification is not necessary.

2.4 Data

Table 2a

| Categories | | Forest area (000 hectares) | | | | |
|---|------------------------------------|----------------------------|---------|---------|---------|---------|
| | | 1990 | 2000 | 2005 | 2010 | 2015 |
|  | Primary forest | 7 | 7 | 7 | 7 | 7 |
|  | Other naturally regenerated forest | 1751 | 1797 | 1820 | 1843 | 1840 |
|  | ... of which of introduced species | 54 | 55 | 56 | 56 | 57 |
|  | ... of which naturalized | 54 | 55 | 56 | 56 | 57 |
|  | Planted forest | 92 | 81 | 76 | 70 | 75 |
|  | ... of which of introduced species | 28 | 27 | 27 | 27 | 27 |
| TOTAL | | 1850.00 | 1885.00 | 1903.00 | 1920.00 | 1922.00 |

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 2 | Tier 2 |
| Other naturally regenerated forest | Tier 2 | Tier 2 |
| Planted forest | Tier 2 | 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)</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> |

2.5 Comments

| Category | Comments related to data definitions etc | Comments on reported trend |
|----------------|--|----------------------------|
| Primary forest | They are situated in strictly protected areas: strict reserves, national parks and special reserves. Primary forest area in IUCN categories I-IV is 6 505 ha, and outside this categories, in nature park, 225 ha. | N/A |

| | | |
|-------------------------------------|--|---|
| Other naturally regenerating forest | Most of forests in this category are natural forests by origin, except black locust (<i>Robinia pseudoacacia</i> L.) forests that are included in other naturally regenerated forest with introduced species sub-category. By detailed forest measurement in 2006, for the purpose of compilation of Forest Management Plan for The Republic of Croatia, it is identified that black locust forests covers double more area than the earlier data indicated. That increase refers to private forests mostly. | Increase in this category area is partly result of more detailed measurements in 2006, while on the other hand, decrease in planted forests category has also effected it. |
| Planted forest | Different definitions during the time in Ordinances on Forest Management had a significant impact on data in this category. E.g. according the Ordinance from 1985, definition for cultures and plantations is "artificially raised stands with species outside their natural range". In 1994 this definitions narrows down only to artificially raised stands with use of agrotechnical measures and with possibility of using interspaces. The newest, actual Ordinance from 2006 (with changes in 2008) includes two categories: cultures (artificially raised stands without use of agrotechnical measures) and plantations (with agrotechnical measures). | In the last 20 years, a decrease in area of planted forests is noticed. A part of planted forests with autochthonous species, after first restoration, assigned to naturally regenerated forest. A part of areas planted with introduced species, especially plantations of euroamerican poplars, were left to natural succession, e.g. natural lodging of black alder (<i>Alnus glutinosa</i> (L.) Geartn.), narrow-leafed ash (<i>Fraxinus angustifolia</i> Vahl.) and other species. We assume that this trend will stop after the 2010. |
| Mangroves | Not applicable. | 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 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993. | Tree species in forest and their growing stock | 1986 | Valid from 1986 until 1995, updated to 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1996. | Tree species in forest and their growing stock | 1996 | Valid from 1996 until 2005, updated to 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006. | Tree species in forest and their growing stock | 2006 | Valid from 2006 until 2015, updated to 01.01.2006. |

| | | | | |
|---|---|--|-----------|---|
| 4 | Croatian Forests Ltd., Management Plan for management unit "Kotor planina", 2008 (used data assessment of trees in scrubland) | Growing stock on other wooded land | 2008 | N/A |
| 5 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006 | Tree species in forest and their growing stock | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 6 | Croatian Forests Ltd., Management Plan for management unit "Kotor planina", 2008 (used data assessment of trees in scrubland) | Growing stock on other wooded land | 2008 | N/A |
| 7 | Croatian Forests Ltd., Validated management plans for management units | Tree species in forest and their growing stock | 2010,2012 | N/A |
| 8 | IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry, 2003 | Ratio of below – ground biomass to above – ground biomass (R) – temperate domain; Default biomass conversion and expansion factors – (BCEF) – temperate and mediterranean, dry tropical, subtropical climatic zone | N/A | N/A |

3.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

3.2.3 Original data

| |
|--|
| <p>Biomass stock</p> <p>All national classification and definitions for forest biomass stock correspond to FRA classification and definitions.</p> <p>Carbon stock</p> |
|--|

All national classification and definitions for forest carbon stock correspond to FRA classification and definitions.

| | |
|--------------------------------|--|
| Carbon in above-ground biomass | Same as FRA 2015 |
| Carbon in below-ground biomass | Same as FRA 2015 |
| Carbon in dead wood | Same as FRA 2015 |
| Carbon in litter | Same as FRA 2015 |
| Soil carbon | Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series. (FRA 2010) |

Growing stock

| National classes | 1986. | | | 1996. | | | 2006. | | |
|--|--------------|-------------------|--------------------|--------------|-------------------|--------------------|--------------|-------------------|--------------------|
| | Area | Growing stock | | Area | Growing stock | | Area | Growing stock | |
| | ha | m ³ | m ³ /ha | ha | m ³ | m ³ /ha | ha | m ³ | m ³ /ha |
| Forest (high forest, coppice, plantations etc.) | 1 825 343 | 298 411 162 | 163 | 1 748 343 | 324 256 137 | 185 | 1 899 638 | 397 963 282 | 211 |
| Other wooded land (maquis, garigue, shrub and scrub) | 236 166 | - | - | 329 946 | - | - | 513 144 | | - |
| Total | 2 061 509 | 298 411 162 | 145 | 2 078 289 | 324 256 137 | 156 | 2 402 782 | 397 963 282 | 166 |

In Republic of Croatia, growing stock for Other wooded land (scrubland) is not measured and it is not covered in the Forest Management Plan of the Republic of Croatia. For the purpose of FRA 2010, all the trees with diameter more than 10 cm at breast height on 239.34 ha in category Other wooded land were measured on grid system samples. Growing stock was calculated to be 10.28 m³/ha. Basal area is 3.12 m²/ha. Total growing stock would be significantly bigger if the trees with diameter less than 10 cm at breast height would be included too.

| Species name | Growing stock (m3 o.b.) | | |
|---------------------|-------------------------|--------------------|--------------------|
| | 1986 | 1996 | 2006 |
| Common beech | 105 297 612 | 118 197 958 | 143 344 835 |
| Pedunculate oak | 41 598 258 | 44 980 967 | 48 640 147 |
| Sessile oak | 27 971 354 | 32 386 239 | 38 409 655 |
| Common hornbeam | 23 043 099 | 24 892 301 | 36 339 991 |
| European silver fir | 34 360 233 | 30 475 088 | 31 406 078 |
| Narrow-leafed ash | 9 336 373 | 10 280 248 | 12 762 183 |
| Spruce | 4 918 592 | 6 525 657 | 8 548 834 |
| Black locust | 2 139 496 | 1 817 525 | 7 997 737 |
| Black alder | 3 328 261 | 3 533 065 | 7 826 258 |
| Turkey oak | 2 710 388 | 3 598 901 | 6 181 747 |
| Remaining | 43 707 496 | 47 568 188 | 56 505 817 |
| Total | 298 411 162 | 324 256 137 | 397 963 282 |

Original data - FRA 2015

Growing stock volume - Forest (mil. m3)

| Category | 2010 | 2012 |
|-------------|--------|--------|
| Broadleaved | 353.44 | 356.28 |
| Coniferous | 52.85 | 53.47 |

| | | |
|-------|--------|--------|
| Total | 406.29 | 409.75 |
|-------|--------|--------|

Biomass stock

Data on growing stock are used and the IPCC conversion factors are applied on them.

Carbon stock

Data on carbon stock and Carbon fraction (CF) from IPCC *Good Practice Guidance for Land Use, Land Use Change and Forestry, 2003* are used.

3.3 Analysis and processing of national data

3.3.1 Adjustment

Biomass and carbon stock

Calibration is not necessary.

3.3.2 Estimation and forecasting

Growing stock

Analysis and processing

| | 1986 | 1996 | 2006 | 1990 | 2000 | 2005 | 2010 |
|--|----------------|----------------|---------------|----------------|----------------|----------------|----------------|
| Forest (m ³ o.b.) | 298 411 162 | 324 256 137 | 397 963282 | 310 344 558 | 360 120 618 | 385 008 648 | 409 896 678 |
| Other wooded land (m ³ o.b.) | - | - | - | 2 844 050 | 4 267 717 | 4 979 551 | 5 691 384 |

The 1990, 2000 and 2005 estimation was made by linear interpolation, while the forecasting for 2010 was made by linear extrapolation. For other wooded land, the area as of table T1 was multiplied by 10.28 m³/ha.

Estimation for 2015:

Growing stock (mil. m3 ob)

| Category | 2010 | 2012 | 2015 |
|-------------|--------|--------|--------|
| Broadleaved | 353,44 | 356,28 | 360,54 |
| Coniferous | 52,85 | 53,47 | 54,4 |
| Total | 406,29 | 409,75 | 414,94 |

Biomass stock

Estimation is made on the basis of IPCC default biomass conversion and expansion factors (BCEF), IPCC ratio of below-ground biomass to above-ground biomass (R) and the data on biomass stock.

Above-ground biomass

| | Forest | | | | Other wooded land | | | |
|--|--------|--------|--------|--------|-------------------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 | 1990 | 2000 | 2005 | 2010 |
| Growing stock - conifers (mill.m3 o.b.) (from table 6a) | 47.32 | 49.07 | 49.94 | 50.81 | | | | |
| Growing stock - broadleaves (mill.m3 o.b.) (from table 6a) | 263.02 | 311.05 | 335.07 | 359.09 | 2.84 | 4.27 | 4.98 | 5.69 |
| BCEF for conifers | 0.7 | 0.7 | 0.7 | 0.7 | | | | |
| BCEF for broadleaves | 1.05 | 1.05 | 1.05 | 1.05 | 5 | 5 | 5 | 5 |

| | | | | | | | | |
|--|--------|--------|--------|--------|-------|-------|-------|-------|
| Above-ground biomass of conifers (mill. metric tones oven-dry weight) | 33.12 | 34.35 | 34.96 | 35.57 | | | | |
| Above-ground biomass of broadleaves (mill. metric tones oven-dry weight) | 276.17 | 326.60 | 351.82 | 377.04 | 14.20 | 21.35 | 24.90 | 28.45 |
| TOTAL ABOVE-GROUND BIOMASS (mill. metric tones oven-dry weight) | 309.30 | 360.95 | 386.78 | 412.61 | 14.20 | 21.35 | 24.90 | 28.45 |

Below-ground biomass

| | Forest | | | | Other wooded land | | | |
|-----------------------------------|--------|--------|--------|--------|-------------------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 | 1990 | 2000 | 2005 | 2010 |
| Coniferous forests area (1000 ha) | 203.50 | 207.35 | 209.33 | 211.20 | | | | |

| | | | | | | | | |
|--|---------|---------|---------|---------|-------|-------|-------|-------|
| Broadleaved forests | 1646.50 | 1677.65 | 1693.67 | 1708.80 | 277 | 415 | 484 | 554 |
| area (1000 ha) | | | | | | | | |
| Above- ground biomass of conifers (t/ha) | 162.77 | 165.66 | 167.00 | 168.40 | | | | |
| Above- ground biomass of broadleaves (t/ha) | 167.73 | 194.68 | 207.73 | 220.65 | 51.26 | 51.45 | 51.45 | 51.35 |
| R for conifers | 0.305 | 0.305 | 0.305 | 0.305 | | | | |
| R for broadleaves | 0.305 | 0.305 | 0.305 | 0.305 | 0.525 | 0.525 | 0.525 | 0.525 |
| Below- ground biomass of conifers (mill. metric tones oven- dry weight) | 10.10 | 10.48 | 10.66 | 10.85 | | | | |
| Below- ground biomass of broadleaves (mill. metric tones oven- dry weight) | 84.23 | 99.61 | 107.31 | 115.00 | 7.46 | 11.21 | 13.07 | 14.94 |

| | | | | | | | | |
|--|-------|--------|--------|--------|------|-------|-------|-------|
| TOTAL BELOW- GROUND BIOMASS (mill. metric tones oven- dry weight) | 94.33 | 110.09 | 117.97 | 125.85 | 7.46 | 11.21 | 13.07 | 14.94 |
|--|-------|--------|--------|--------|------|-------|-------|-------|

Carbon stock

Estimation is made using IPCC carbon fraction (CF) of 0,47.

3.3.3 Reclassification

Biomass and carbon stock

Reclassification is not necessary.

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 | 310.34 | 360.12 | 385.01 | 406.29 | 414.94 | 2.84 | 4.27 | 4.98 | 5.69 | 5.85 |
|  | ... of which coniferous | 47.32 | 49.07 | 49.94 | 52.85 | 54.4 | 0 | 0 | 0 | 0 | 0 |
|  | ... of which broadleaved | 263.02 | 311.05 | 335.07 | 353.44 | 360.54 | 2.84 | 4.27 | 4.98 | 5.69 | 5.85 |

Table 3b

| Category/Species name | | | Growing stock in forest (million cubic meters) | | | |
|-----------------------|----------------------|--------------|--|--------|-------|--------|
| Rank | Scientific name | Common name | 1990 | 2000 | 2005 | 2010 |
| 1 st | Fagus sylvatica L | Common beech | 110.87 | 129.89 | 139.4 | 146.84 |

| | | | | | | |
|-----------|--------------------------------|---------------------|--------|--------|--------|--------|
| 2 nd | Quercus robur L. | Pedunculate oak | 42.96 | 46.48 | 48.24 | 48.78 |
| 3 rd | Quercus petraea (Matt.) Liebl. | Sessile oak | 29.79 | 35.01 | 37.62 | 38.8 |
| 4 th | Carpinus betulus L. | Common hornbeam | 24.1 | 30.75 | 34.08 | 37.01 |
| 5 th | Abies alba Mill. | European silver fir | 32.97 | 31.49 | 30.75 | 31.8 |
| 6 th | Fraxinus angustifolia Vahl. | Narrow-leafed ash | 9.77 | 11.48 | 12.33 | 13.01 |
| 7 th | Picea abies (L.) H.Karst. | Spruce | 5.58 | 7.39 | 8.3 | 8.87 |
| 8 th | Alnus glutinosa (L.) Geartn. | Black alder | 3.55 | 5.8 | 6.92 | 7.97 |
| 9 th | Robinia pseudoacacia L. | Black locust | 2.23 | 5.16 | 6.62 | 8.28 |
| 10 th | Quercus cerris L. | Turkey oak | 3.12 | 4.86 | 5.73 | 6.55 |
| Remaining | | | 45.4 | 51.81 | 55.02 | 58.38 |
| TOTAL | | | 310.34 | 360.12 | 385.01 | 406.29 |

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) | 10 | N/A |
| Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y) | 7 | N/A |
| Minimum diameter (cm) of branches included in growing stock (W) | 7 | N/A |
| Volume refers to above ground (AG) or above stump (AS) | AG | 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 | 5.1 | 4.9 | 5 | 4.3 | 4.3 |
|  | ... of which coniferous | 0.4 | 0.4 | 0.6 | 0.6 | 0.6 |
|  | ... of which broadleaved | 4.7 | 4.5 | 4.4 | 3.7 | 3.7 |

Table 3d

| Category | | Biomass (million metric tonnes oven-dry weight) | | | | | | | | | |
|---|----------------------|---|--------|--------|--------|--------|-------------------|-------|-------|-------|-------|
| | | Forest | | | | | Other wooded land | | | | |
| | | 1990 | 2000 | 2005 | 2010 | 2015 | 1990 | 2000 | 2005 | 2010 | 2015 |
|  | Above ground biomass | 309.3 | 360.95 | 386.78 | 408.11 | 416.65 | 14.2 | 21.35 | 24.9 | 28.45 | 29.25 |
|  | Below ground biomass | 94.33 | 110.09 | 117.97 | 124.47 | 127.08 | 7.46 | 11.21 | 13.07 | 14.94 | 15.36 |
|  | Dead wood | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| TOTAL | | 403.63 | 471.04 | 504.75 | 532.58 | 543.73 | 21.66 | 32.56 | 37.97 | 43.39 | 44.61 |

Table 3e

| Category | | Carbon (Million metric tonnes) | | | | | | | | | |
|---|--------------------------------|--------------------------------|--------|--------|--------|--------|-------------------|-------|-------|-------|-------|
| | | Forest | | | | | Other wooded land | | | | |
| | | 1990 | 2000 | 2005 | 2010 | 2015 | 1990 | 2000 | 2005 | 2010 | 2015 |
|  | Carbon in above ground biomass | 145.37 | 169.65 | 181.79 | 191.81 | 195.82 | 6.67 | 10.03 | 11.7 | 13.37 | 13.75 |
|  | Carbon in below ground biomass | 44.34 | 51.74 | 55.45 | 58.5 | 59.73 | 3.51 | 5.27 | 6.14 | 7.02 | 7.22 |
|  | <i>Subtotal Living biomass</i> | 189.71 | 221.39 | 237.24 | 250.31 | 255.55 | 10.18 | 15.3 | 17.84 | 20.39 | 20.97 |
|  | Carbon in dead wood | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|  | Carbon in litter | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | |
|---|--|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
|  | <i>Subtotal Dead wood and litter</i> | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
|  | Soil carbon | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| TOTAL | | 189.71 | 221.39 | 237.24 | 250.31 | 255.55 | 10.18 | 15.30 | 17.84 | 20.39 | 20.97 |

Tiers

| Variable/category | Tier for status | Tier for trend |
|--------------------------------|-----------------|----------------|
| Total growing stock | Tier 1 | Tier 1 |
| Net annual increment | Tier 1 | Tier 1 |
| Above ground biomass | Tier 1 | Tier 1 |
| Below ground biomass | Tier 1 | Tier 1 |
| Dead wood | N/A | N/A |
| Carbon in above-ground biomass | Tier 1 | Tier 1 |
| Carbon in below ground biomass | Tier 1 | Tier 1 |
| Carbon in dead wood and litter | N/A | N/A |
| Soil carbon | N/A | N/A |

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 | 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 | 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 |

3.5 Comments on growing stock biomass and carbon

| Category | Comments related to data definitions etc | Comments on the reported trend |
|---|--|---|
| Total growing stock | We were not able to present growing stock according to the new definition, and therefore, FRA 2010 definition was used. There is no method to make conversion, especially for broadleaved species. Also, we cannot estimate the volume of branches, since our calculation include branches and top end of stem until minimum diameter of 7 cm. | N/A |
| Growing stock of broadleaved coniferous | N/A | The trend in rising growing stock in <i>Alnus glutinosa</i> (L.) Geartn, <i>Robinia pseudoacacia</i> L. and <i>Quercus cerris</i> L. does not indicate actual rising of growing stock because in the past reporting, those tree species were included in some collective categories, like other broadleaf (<i>Alnus glutinosa</i> (L.) Geartn in soft broadleaf, <i>Robinia pseudoacacia</i> L. and <i>Quercus cerris</i> L. in hard broadleaf) |

| | | |
|---------------------------|---|--|
| Growing stock composition | N/A | <p>Recently, the trend in decline of <i>Abies alba</i> Mill. has increased, and scientific research is now in progress to find out the reasons for it (acid rains, natural succession, climate changes). In selection forests <i>Fagus sylvatica</i> L. and <i>Abies alba</i> Mill. often grow together and the changes in composition are occurring. Ecological amplitude of <i>Abies alba</i> Mill. is smaller than the amplitude of <i>Fagus sylvatica</i> L. and it leads to survival and increase in volume of <i>Fagus sylvatica</i> L. which is vital specie and easy to rejuvenate, while the volume of <i>Abies alba</i> Mill. is decreasing.</p> |
| Net annual increment | <p>Since there are no full-scale data on natural losses in increment, net annual increment was calculated by following method: difference in growing stock for 5-year periods was calculated for each year (e.g. for 1990, the difference was calculated for 1988-1992 period). This difference was added to total harvested growing stock for those 5 years. The sum of those two values divided to 5 and to area (ha) results in net annual increment. The value for 2015 was estimated with “forecast” function, on the bases of previously calculated values.</p> | <p>It is possible that a larger proportion of sanitary felling lately may explain decrease in net increment.</p> |
| Above-ground biomass | <p>Medium values of the default biomass conversion and expansion factors (BCEF) are used because growing stock figures do not include branches and tops with diameter less than 7 cm. They also do not include growing stock of stands up to 20 years old which do not reach 10 cm in diameter. Medium values of BCEFs are used for other wooded land because the data in that category are very variable and measured on a very small sample. Total growing stock of forests for conifers is multiplied with factor 0,7 (climatic zone - temperate; forest type - other conifers). Total growing stock for broadleaves is multiplied with factor 1,05 (climatic zone - temperate; forest type - hardwood). Total growing stock of other wooded land for broadleaves is multiplied with factor 5 (climatic zone - Mediterranean, dry tropical, subtropical; forest type - hardwoods).</p> | N/A |

| | | |
|--------------------------------|--|-----|
| Below-ground biomass | Area of broadleaved and coniferous forests is calculated in accordance to composition from extent of forest (T1) - broadleaved forests make 89% and coniferous forests make 11% of total forest area. Other wooded land is completely covered in broadleaved forests. Medium values for ratio of below-ground biomass to above-ground biomass (R) are used. Temperate climatic zone is used as a domain. The above-ground biomass of coniferous in forests category is above 150 t/ha, so it is multiplied with factor 0,305. The above-ground biomass of broadleaves in forests category is above 150 t/ha, so it is multiplied with factor 0,305. The above-ground biomass of broadleaves in other wooded land category is below 75 t/ha, so it is multiplied with factor 0,525. | N/A |
| Dead wood | Data is not available. | N/A |
| Carbon in above-ground biomass | Total above-ground biomass stock is multiplied with IPCC carbon fraction (CF) 0,47 | N/A |
| Carbon in below-ground biomass | Total below-ground biomass stock is multiplied with IPCC carbon fraction (CF) 0,47 | N/A |
| Carbon in dead wood | Data is not available. | N/A |
| Carbon in litter | Data is not available. | N/A |
| Soil carbon | Data is not available. | N/A |

Other general comments to the table

The 2010 values in tables 3d and 3e were slightly corrected in regard to FRA 2010.

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 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 1993 | Production forests, protection forests, forest with special purposes | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 1996 | Production forests, protection forests, forest with special purposes | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 2006 | Production forests, protection forests, forest with special purposes | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd, Map of Forest Cover, M1:5000, Zagreb, 2006 | Production forests, protection forests, forest with special purposes | 2006 | N/A |

4.2.2 Classification and definitions

| National class | Definition |
|-------------------------------|---|
| Forest function | The definition is compatible to FRA definition “Primary designated function”. According to their function, forests can be production (economic) forests, protection (protection of soil and water) forests and forest with special purposes. |
| Production forests | Forests primarily used for timber production and the production of other forest products accompanied by the preservation and improvement of their functions of general benefit. |
| Forests with special purposes | Forests with special purposes: 1. forests and forest parts registered for the production of forest seeds, 2. forests within the protected areas or natural values protected pursuant to environmental protection regulations, 3. forests intended for the scientific research, education, defense requirements of the Republic of Croatia and other requirements prescribed by special regulations. |
| N/A | N/A |

4.2.3 Original data

Note to table 4.2.2

Data source for definitions:

1. Ministry of Agriculture, Forestry and Water Management, 2005, Forest Law (*Narodne novine* 140/2005, 81/2006 and 129/2008);
2. Ministry of Culture, 2005, Nature Protection Act (*Narodne novine* 70/2005 and 139/2008).

Production forests

| National classes | Area of forest and other wooded land (ha) | | |
|---|--|----------------|----------------|
| | 1986 | 1996 | 2006 |
| 1. Production forests - total | 2350467 | 2341483 | 2416109 |
| A) Stocked forest land | 1972986 | 1981032 | 2168875 |
| a) high forest, plantation and coppice | 1740502 | 1663938 | 1723042 |

| | | | |
|--|---------------|---------------|---------------|
| b)scrubland | 232484 | 317094 | 445833 |
| B)Unstocked forest land | 377481 | 360451 | 247234 |
| a) productive forest land without tree cover | 301855 | 297555 | 181659 |
| b)non-productive forest land without tree cover | 16357 | 13671 | 27038 |
| c)barren wooded land | 59269 | 49225 | 38537 |
| 1.1. Production forests outside protected areas | | 2139039 | 2184972 |
| A) Stocked forest land | | 1816293 | 1976584 |
| a) high forest, plantation and coppice | | 1530743 | 1565966 |
| b) scrubland | | 285550 | 410618 |
| B) Unstocked forest land | | 322746 | 208388 |
| a) productive forest land without tree cover | | 265864 | 152374 |
| b) non-productive forest land without tree cover | | 12772 | 22470 |
| c) barren wooded land | | 44110 | 33544 |
| 1.2. Production forests inside protected areas | | 202444 | 231137 |
| A) Stocked forest land | | 164739 | 192291 |
| a) high forest, plantation and coppice | | 133195 | 157076 |
| b) scrubland | | 31544 | 35215 |
| B) Unstocked forest land | | 37705 | 38846 |
| a) productive forest land without tree cover | | 31691 | 29285 |

| | | | |
|--|--|------|------|
| b) non-productive forest land without tree cover | | 899 | 4568 |
| c) barren wooded land | | 5115 | 4993 |

Production forests are divided into two categories: Production forests outside protected areas that are managed according to the Forest Management Plan approved by the Ministry in charge of forestry, and Production forests inside protected areas (in this case, the data refers only to forests within the area of nature park that are also managed according to the Forest Management Plan but with built-in nature protection requirements issued by the Ministry in charge of nature protection who also pre-approves the Forest Management Plan if they consider that prescribed actions (fellings and cultivation) will not endanger important aspects of protected area.

We consider that Production forests inside protected areas have a multiple purpose according to FRA definitions, so they are displayed separately, but because of the last changes in the Croatian Forest law, this category is displayed in group “Forests with special purposes” during each revision of the Forest Management Plan from 2006.

Nature park, according definition, is a large natural or partly cultivated area of land and/or sea distinguished by ecological features of international and national importance with marked landscape, educational, cultural-historical, tourist-recreational values.

Regional parks are a new category in protected areas group, similar to nature park, but with emphasized regional characteristics. In the future, significant increase in forest area in this category can be expected, as well as all the forests with multiple purposes. At the same time, a decrease in area of forests with primarily production purposes can be expected.

Although the original data for 1986 show only the total area of major 3 groups of functions, we easily reconstructed the proportion of production forests within nature parks, because between 1986 and 1996 not one new nature park was proclaimed, so it is the same area.

Protection forests (Protection of soil and water)

| National classes | Area of forest and other wooded land (ha) | | |
|---|--|--------------|---------------|
| | 1986 | 1996 | 2006 |
| 2. Protection forests- total | 71472 | 90312 | 154539 |
| A) Stocked forest land | 54760 | 47624 | 130630 |

| | | | |
|--|--------------|--------------|--------------|
| a)high forest, plantation and coppice | 52927 | 38677 | 81532 |
| b)scrubland | 1833 | 8947 | 49098 |
| B)Unstocked forest land | 16712 | 42688 | 23909 |
| a) productive forest land without tree cover | 13008 | 31325 | 18781 |
| b)non-productive forest land without tree cover | 59 | 603 | 1504 |
| c)barren wooded land | 3645 | 10760 | 3624 |

FRA definition for protection forests is completely compatible with national definition.

Forests with special purposes

| National classes | Area of forest and other wooded land (ha) | | |
|---|---|--------------|---------------|
| | 1986 | 1996 | 2006 |
| 3.Forests with special purposes - total | 35709 | 53816 | 118038 |
| A)Stocked forest land | 33763 | 49633 | 103277 |
| a)high forest, plantation and coppice | 31914 | 45728 | 85064 |
| b)scrubland | 1849 | 3905 | 18213 |
| B)Unstocked forest land | 1946 | 4183 | 14761 |
| a) productive forest land without tree cover | 303 | 2454 | 8025 |

| | | | |
|--|-------------|-------------|-------------|
| b)non-productive forest land without tree cover | 545 | 344 | 4410 |
| c)barren wooded land | 1098 | 1385 | 2326 |
| 3.1. Seed stands | | 4374 | 4604 |
| A) Stocked forest land | | 4356 | 4603 |
| a) high forest, plantation and coppice | | 4356 | 4603 |
| b) scrubland | | | |
| B) Unstocked forest land | | 18 | 1 |
| a) productive forest land without tree cover | | 7 | |
| b) non-productive forest land without tree cover | | 3 | |
| c) barren wooded land | | 8 | 1 |
| 3.2. National parks and strict reserves | | 24890 | 58091 |
| A) Stocked forest land | | 23730 | 51392 |
| a) high forest, plantation and coppice | | 20857 | 42179 |
| b) scrubland | | 2873 | 9213 |
| B) Unstocked forest land | | 1160 | 6699 |
| a) productive forest land without tree cover | | 806 | 5282 |
| b) non-productive forest land without tree cover | | 52 | 458 |
| c) barren wooded land | | 302 | 959 |
| 3.3. Forests intended for the scientific research | | 4120 | 4622 |
| A) Stocked forest land | | 4033 | 4428 |

| | | | |
|--|--|------|-------|
| a) high forest, plantation and coppice | | 4033 | 4340 |
| b) scrubland | | | 88 |
| B) Unstocked forest land | | 87 | 194 |
| a) productive forest land without tree cover | | 5 | 98 |
| b) non-productive forest land without tree cover | | 33 | 56 |
| c) barren wooded land | | 49 | 40 |
| 3.4. Forests in use of the Ministry of Defense | | 5837 | 24661 |
| A) Stocked forest land | | 4757 | 23987 |
| a) high forest, plantation and coppice | | 4735 | 17491 |
| b) scrubland | | 22 | 6496 |
| B) Unstocked forest land | | 1080 | 674 |
| a) productive forest land without tree cover | | 992 | 619 |
| b) non-productive forest land without tree cover | | 61 | 20 |
| c) barren wooded land | | 27 | 35 |
| 3.5. Special reserves | | 5386 | 10925 |
| A) Stocked forest land | | 3813 | 5052 |
| a) high forest, plantation and coppice | | 3753 | 4787 |
| b) scrubland | | 60 | 265 |
| B) Unstocked forest land | | 1573 | 5873 |
| a) productive forest land without tree cover | | 525 | 1120 |

| | | | |
|--|--|------|------|
| b) non-productive forest land without tree cover | | 141 | 3790 |
| c) barren wooded land | | 907 | 963 |
| 3.6. Forests for recreation and rest | | 6105 | - |
| A) Stocked forest land | | 5935 | |
| a) high forest, plantation and coppice | | 5022 | |
| b) scrubland | | 913 | |
| B) Unstocked forest land | | 170 | |
| a) productive forest land without tree cover | | 103 | |
| b) non-productive forest land without tree cover | | 36 | |
| c) barren wooded land | | 31 | |
| 3.7. Forest parks | | 1619 | 3771 |
| A) Stocked forest land | | 1592 | 3606 |
| a) high forest, plantation and coppice | | 1565 | 3566 |
| b) scrubland | | 27 | 40 |
| B) Unstocked forest land | | 27 | 165 |
| a) productive forest land without tree cover | | 8 | 99 |
| b) non-productive forest land without tree cover | | 8 | 8 |
| c) barren wooded land | | 11 | 58 |
| 3.8. Natural monuments | | 48 | 123 |
| A) Stocked forest land | | 1 | 29 |

| | | | |
|--|--|------|-------|
| a) high forest, plantation and coppice | | 1 | 29 |
| b) scrubland | | | |
| B) Unstocked forest land | | 47 | 94 |
| a) productive forest land without tree cover | | | 48 |
| b) non-productive forest land without tree cover | | | |
| c) barren wooded land | | 47 | 46 |
| 3.9. Important landscapes | | 372 | 10682 |
| A) Stocked forest land | | 372 | 9913 |
| a) high forest, plantation and coppice | | 362 | 7802 |
| b) scrubland | | 10 | 2111 |
| B) Unstocked forest land | | 0 | 769 |
| a) productive forest land without tree cover | | | 526 |
| b) non-productive forest land without tree cover | | | 47 |
| c) barren wooded land | | | 196 |
| 3.10. Forest for other special purposes (e.g. hunting) | | 1065 | 559 |
| A) Stocked forest land | | 1044 | 267 |
| a) high forest, plantation and coppice | | 1044 | 267 |
| b) scrubland | | | |
| B) Unstocked forest land | | 21 | 292 |
| a) productive forest land without tree cover | | 8 | 233 |

| | | | |
|--|--|----|----|
| b) non-productive forest land without tree cover | | 10 | 31 |
| c) barren wooded land | | 3 | 28 |

Forests with special purposes consist of following subcategories:

- Seed stands – selected stands of the highest quality assigned for production of forest seeds.
- National parks and strict reserves constitute a group of the most strictly protected areas (the data are displayed together for easier reclassification of forests into FRA categories, because in some part their areas overlap). There are 2 strict reserves with total area (forest and other land) 2.395 ha and 8 national parks with area 96.135 ha. According definition, strict reserve means an area of land and/or the sea distinguished by unaltered or slightly altered overall natural environment, earmarked exclusively for the conservation of its original natural character, scientific research which does not affect biological diversity, monitoring the state of nature, and education which does not endanger the free development of natural processes. A national park is a large, predominantly unaltered area of land and/or sea characterized by exceptional and multiple natural assets, comprising one or several preserved or predominantly unaltered ecosystems, and is primarily earmarked for conservation of original natural assets.
- Forests intended for the scientific research – forests to which this purpose is designated on the proposal of scientific institutions.
- Forests in use of the Ministry of Defense – forests for defense requirements of the Republic of Croatia (military polygons)
- Special reserves – according definition, is an area of land and/or sea of particular importance for its uniqueness, rarity or representative character, or is a habitat of endangered wild taxon, having a particular scientific significance and intended purpose.
- A forest for recreation and rest – this category is cancelled by the last legal provisions, and forests are pre-qualified into important landscapes and forest parks.
- Forest parks – natural or planted forests of major landscape value designated for relaxation and recreation.
- Natural monument – a individual unaltered segment or a group of segments of living or non-living nature distinguished by ecological, scientific, aesthetic or educational value, and can be geological, geomorphologic, hydrological, botanical, zoological etc
- Important landscapes – a natural or cultivated tracts of land distinguished by major landscape value and biological diversity or cultural-historical value, or a landscape distinguished by conserved unique features characteristic for a particular area designated for relaxation and recreation.
- Forest for other special purposes – mostly hunting. This category is not a permanent one. Hunting purpose is prescribed only in Forest Management Plan that is valid for 10 year period, and besides that, those forests do not have any other protection. They are also used for production.

The data in category Forests with special purposes are displayed all together, but we reconstructed them for some subcategories on the basis of data from 1996 and the years of proclamation of specific protected areas.

Total all purposes

| National classes | Area of forest and other wooded land (ha) | | |
|---|--|----------------|----------------|
| | 1986 | 1996 | 2006 |
| TOTAL forest and other wooded land | 2457648 | 2485611 | 2688686 |
| A) Stocked forest land | 2061509 | 2078289 | 2402782 |
| a) high forest, plantation and coppice | 1825343 | 1748343 | 1889638 |
| b) scrubland | 236166 | 329946 | 513144 |
| B) Unstocked forest land | 396139 | 407322 | 285904 |
| a) productive forest land without tree cover | 315166 | 331334 | 208465 |
| b) non-productive forest land without tree cover | 16961 | 14618 | 32952 |
| c) barren wooded land | 64012 | 61370 | 44487 |

For 2015 estimation, 2012 data were used. Newly designated regional parks (since FRA 2010 reporting) are added to Multiple use forest category:

| Category | Forest (1000 ha) |
|--|------------------|
| Productive forests | 1548 |
| Forests within nature parks and regional parks | 202 |

4.3 Analysis and processing of national data

4.3.1 Adjustment

| |
|-------------------------------|
| Calibration is not necessary. |
|-------------------------------|

4.3.2 Estimation and forecasting

| National classes (Forest according to FRA categories) | Forest area (ha) | | |
|---|------------------|---------|---------|
| | 1986 | 1996 | 2006 |
| 1. Production forests - total | 1786493 | 1702221 | 1769348 |
| 1.1. Production forests outside protected areas | 1649842 | 1565570 | 1605208 |
| 1.2. Production forests inside protected areas | 136651 | 136651 | 164140 |
| 2. Protection forests - total | 54809 | 44660 | 84848 |
| 3. Forests with special purposes - total | 33008 | 46765 | 90638 |
| 3.1. Seed stands | 2829 | 4363 | 4604 |
| 3.2. National parks and strict reserves | 21060 | 21060 | 43117 |
| 3.3. Forests intended for the scientific research | 2256 | 4091 | 4416 |
| 3.4. Forests in use of the Ministry of Defense | 0 | 4809 | 17528 |
| 3.5. Special reserves | 2398 | 4348 | 9059 |
| 3.6. Forests for recreation and rest | 2799 | 5074 | 0 |
| 3.7. Forest parks | 870 | 1578 | 3603 |
| 3.8. Nature monument | 14 | 25 | 52 |
| 3.9. Important landscapes | 200 | 362 | 7947 |

| | | | |
|---|---------|---------|---------|
| 3.10. Forests for other special purposes (e.g. hunting) | 582 | 1055 | 312 |
| TOTAL | 1874310 | 1793646 | 1944834 |

Original reclassification was made as in Question 1, where only areas that correspond to FRA definitions were included in national classes according to purpose. After that, estimation and forecasting were made using linear interpolation for 1990, 2000 and 2005 and linear extrapolation for 2010. Following data are calculated:

| National classes according to FRA categories | Forest area (ha) | | | |
|---|------------------|---------|---------|---------|
| | 1990 | 2000 | 2005 | 2010 |
| 1. Production forests - total | 1757831 | 1749258 | 1744972 | 1740686 |
| 1.1. Production forests outside protected areas | 1620264 | 1597946 | 1586788 | 1575630 |
| 1.2. Production forests inside protected areas | 137567 | 151312 | 158184 | 165056 |
| 2. Protection forests - total | 52427 | 67447 | 74956 | 82466 |
| 3. Forests with special purposes - total | 39515 | 68330 | 82737 | 97144 |
| 3.1. Seed stands | 3400 | 4287 | 4731 | 5174 |
| 3.2. National parks and strict reserves | 21795 | 32824 | 38338 | 43852 |
| 3.3. Forests intended for the scientific research | 2940 | 4020 | 4560 | 5100 |
| 3.4. Forests in use of the Ministry of Defense | 2187 | 10951 | 15333 | 19715 |

| | | | | |
|---|----------------|----------------|----------------|----------------|
| 3.5. Special reserves | 3270 | 6600 | 8266 | 9931 |
| 3.6. Forests for recreation and rest | 3464 | 2064 | 1365 | 665 |
| 3.7. Forest parks | 1197 | 2564 | 3247 | 3930 |
| 3.8. Natural monument | 19 | 38 | 47 | 57 |
| 3.9. Important landscapes | 512 | 4386 | 6322 | 8259 |
| 3.10. Forests for other special purposes (e.g. hunting) | 731 | 596 | 528 | 461 |
| TOTAL | 1849773 | 1885035 | 1902665 | 1920296 |

4.3.3 Reclassification

4.4 Data

Table 4a

| Categories | | Forest area (000 hectares) | | | | |
|---|---------------------|----------------------------|------|------|------|------|
| | | 1990 | 2000 | 2005 | 2010 | 2015 |
|  | Production forest | 1624 | 1602 | 1591 | 1581 | 1548 |
|  | Multiple use forest | 138 | 152 | 159 | 165 | 202 |

Table 4b

| Rank | Name of product | Key species | Commercial value of NWFP removals 2010 (value 1000 local currency) | NWFP category |
|------|-----------------|-------------|--|---------------|
|------|-----------------|-------------|--|---------------|

| | | | | |
|-------|---|--|-----------|----|
| 1 st | Forest seeds | Quercus robur, Quercus petraea, Quercus pubescens, Quercus ilex, Quercus cerris, Fagus sylvatica, Alnus glutinosa, Juglans nigra, Acer pseudoplatanus, Castanea sativa, Abies alba, Pinus halepensis, Prunus avium | 15114.853 | 8 |
| 2 nd | Wild meat | Cervus elephus, Dama dama, Capreolus capreolus, Rupicapra rupicapra, Ovis musimon, Sus scrofa, Ursus arctos | 7918.642 | 12 |
| 3 rd | Trophies | Cervus elaphus, Dama dama, Capreolus capreolus, Rupicapra rupicapra, Ovis musimon, Sus scrofa, Ursus arctos, Coturnix coturnix, Scolopax rusticola | 6326.61 | 10 |
| 4 th | Christmas trees | Picea abies, Picea pungens, Picea omorica, Abies concolor, Abies nordmanniana | 204.403 | 6 |
| 5 th | Raw material for medicine and aromatic products | Viscum album, Helicrysum italicum | 151.158 | 3 |
| 6 th | Fruits | Ficus carica, Juglans regia, Corylus avellana, Prunus dulcis, Prunus domestica, Castanea sativa, Fragaria vesca, Rosa sp. | 144.828 | 1 |
| 7 th | Branches | Abies alba, Hedera helix | 26.696 | 6 |
| 8 th | Ferns | N/A | 24.22 | 6 |
| 9 th | Mushrooms | N/A | 12.15 | 1 |
| 10 th | Hay | N/A | 11.614 | 2 |
| TOTAL | | | 29935.17 | |

| | |
|------------------------|---------------------|
| 2010 | |
| Name of local currency | Croatian kuna (HRK) |

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 | N/A | N/A |
| 1991 | N/A | N/A |
| 1992 | N/A | N/A |
| 1993 | N/A | N/A |
| 1994 | N/A | N/A |
| 1995 | N/A | N/A |

| | | |
|------|-----|-----|
| 1996 | N/A | N/A |
| 1997 | N/A | N/A |
| 1998 | N/A | N/A |
| 1999 | N/A | N/A |
| 2000 | N/A | N/A |
| 2001 | N/A | N/A |
| 2002 | N/A | N/A |
| 2003 | N/A | N/A |
| 2004 | N/A | N/A |
| 2005 | N/A | N/A |
| 2006 | N/A | N/A |
| 2007 | N/A | N/A |
| 2008 | N/A | N/A |
| 2009 | N/A | N/A |
| 2010 | N/A | N/A |
| 2011 | N/A | N/A |

Tiers

| Category | Tier for status | Tier for reported trend |
|---------------------|-----------------|-------------------------|
| Production forest | Tier 2 | Tier 2 |
| Multiple use forest | Tier 2 | Tier 2 |

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 | N/A | N/A |
| Multiple use forest | N/A | N/A |
| Total wood removals | N/A | N/A |
| Commercial value of NWFP | N/A | N/A |

Other general comments to the table

With regard to the Table 4a - difference between the total forest area and presented sum, consists of protective forests, forests for conservation of biodiversity and forests with a pronounced social function. Regarding table 4c - data will be pre-filled by FAOSTAT.

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 | 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 |

5.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

5.2.3 Original data

Total area of protected forests is presented, and subcategories partially overlap with subcategories listed in table 5a. There are following subcategories in Croatia: soil protection, protection of waterflows, erosion protection, settlement and facilities protection.

Table 5b includes forest areas intended for recreation and leisure, park forests, significant landscapes, monuments of nature, etc.

5.3 Analysis and processing of national data

5.3.1 Adjustment

| |
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5.3.2 Estimation and forecasting

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| |
|--|

5.3.3 Reclassification

| |
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| |
|--|

5.4 Data

Table 5a

| Categories | Forest area (1000 hectares) | | | | |
|------------|-----------------------------|------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 | 2015 |
| | | | | | |

| | | | | | | |
|---|---|-----|-----|-----|-----|-----|
|  | Protection of soil and water | 53 | 68 | 75 | 82 | 73 |
|  | ... of which production of clean water | N/A | N/A | N/A | N/A | N/A |
|  | ... of which coastal stabilization | 0 | 0 | 0 | 0 | 0 |
|  | ... of which desertification control | 0 | 0 | 0 | 0 | 0 |
|  | ... of which avalanche control | 0 | 0 | 0 | 0 | 0 |
|  | ... 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 |

Other

N/A

Table 5b

| Categories | Forest area (1000 hectares) | | | | |
|--|-----------------------------|------|------|------|------|
| | 1990 | 2000 | 2005 | 2010 | 2015 |
| Ecosystem services, cultural or spiritual values | 10 | 24 | 31 | 38 | 45 |
| ...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 1 | Tier 1 |
| Ecosystem services, cultural or spiritual values | Tier 1 | Tier 1 |

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 | 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 | 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 |

5.5 Comments

| Category | Comments related to data definitions etc | Comments on the reported trend |
|--|--|--------------------------------|
| Protection of soil and water | N/A | N/A |
| 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 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 1993 | Production forests, protection forests, forest with special purposes | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 1996 | Production forests, protection forests, forest with special purposes | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 2006 | Production forests, protection forests, forest with special purposes | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd., map of Forest Cover, M 1:5000, Zagreb, 2006 | Production forests, protection forests, forest with special purposes | 2006 | N/A |

6.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
|----------------|------------|

| | |
|-----------------|---|
| Protected areas | The definition is compatible to FRA definition “Protected areas”. According to the Law on nature protection, protected areas make a part of altogether protected natural values and encompass following categories: strict reserve, national park, special reserve, nature park, regional park, natural monument, important landscape, forest park and monument of park architecture. In protected areas, economical activities, apropos exploitation of natural goods are not allowed, except within the area of nature park and regional park where economical activities can be performed with previously requested nature protection requirements issued by Ministry in charge of nature protection. Those requirements are built in management plan for every management unit whose forests are found within borders of those two protected areas. |
| N/A | N/A |
| N/A | N/A |
| N/A | N/A |

6.2.3 Original data

See 4.2.3.

6.3 Analysis and processing of national data

6.3.1 Adjustment

See 4.3.1.

6.3.2 Estimation and forecasting

See 4.3.2.

6.3.3 Reclassification

See 4.3.3.

6.4 Data

Table 6

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

| | | | | | | |
|---|------------------------------------|----|----|----|----|----|
|  | Conservation of biodiversity | 25 | 39 | 47 | 54 | 54 |
|  | Forest area within protected areas | 25 | 39 | 47 | 54 | 54 |

Tiers

| Category | Tier for status | Tier for reported trend |
|------------------------------------|-----------------|-------------------------|
| Conservation of biodiversity | Tier 2 | Tier 2 |
| Forest area within protected areas | Tier 2 | Tier 2 |

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 | The estimate is the same as in 2010 because there was no increase in this category of protected areas under the Nature Protection Act. | N/A |
| Forest area within protected areas | Forest area within protected areas according the IUCN Protected Area Categories I-IV consists of the following national categories: strict reserves (Ia), national parks (II), natural monuments (III) and special reserves (IV). | N/A |

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 | Forest research institute Jastrebarsko, Centre for diagnosing and forecasting in forestry of Republic of Croatia, "Plant protection service report for 1998" | Affected area, control measures (pesticide name, type and dose, number of treatments, number of destroyed plants) | 1998 | N/A |
| 2 | Forest research institute Jastrebarsko, Centre for diagnosis and forecasting in forestry of Republic of Croatia, "Diagnosing-forecasting forestry plant protection service report for 1999" | Affected area, control measures (pesticide name, type and concentration, number of treatments) | 1999 | N/A |
| 3 | Forest research institute Jastrebarsko, Centre for diagnosing and forecasting in forestry of Republic of Croatia, "Diagnosing-forecasting and reporting service for plant protection in forestry of Republic of Croatia – 2000 annual report", Jastrebarsko 2000 | Affected area, treated area, control measures (pesticide name, type and concentration, number of treatments) | 2000 | N/A |
| 4 | Forest research institute Jastrebarsko, Centre for diagnosis and forecasting in forestry of Republic of Croatia, "Diagnosing-forecasting and reporting service for plant protection in forestry of Republic of Croatia – 2001 annual report", Jastrebarsko 2001 | Affected area, treated area, control measures | 2001 | N/A |

| | | | | |
|----|---|---|------------------|-----|
| 5 | Forest research institute Jastrebarsko, “Annual report of Diagnosing-forecasting and reporting service for plant protection in Republic of Croatia for 2002”, Jastrebarsko 2002 | Affected area, treated area, control measures | 2002 | N/A |
| 6 | Forest research institute Jastrebarsko, “Annual report of Diagnosing-forecasting and reporting service for plant protection in Republic of Croatia for 2003”, Jastrebarsko 2003 | Affected area, treated area, control measures | 2003 | N/A |
| 7 | Forest research institute Jastrebarsko, “Report of Diagnosing-forecasting service in forestry for 2004”, , Jastrebarsko, 2005 | Affected area, treated area, control measures | 2004 | N/A |
| 8 | N/A | Affected area, treated area, control measures | 2005 | N/A |
| 9 | Forest research institute Jastrebarsko, „Diagnosing-forecasting work in forestry for 2006/2007”, Jastrebarsko, 2007 | Affected area, treated area, control measures | 2006 | N/A |
| 10 | Forest research institute Jastrebarsko, „Diagnosing-forecasting work in forestry for 2007/2007”, Jastrebarsko, 2008 | Affected area, treated area, control measures | 2007 | N/A |
| 11 | Croatian Forests Ltd. | Area of 1st age class of common oak forests and narrow-leaved ash forests, area of state owned locust forests | 1996, 2006, 2010 | N/A |
| 12 | Croatian Forests Ltd. | Area of state owned locust forests | 2006, 2010 | N/A |

7.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

7.2.3 Original data

See 7.5. Comments

7.3 Analysis and processing of national data

7.3.1 Adjustment

7.3.2 Estimation and forecasting

7.3.3 Reclassification

7.4 Data

Table 7

| Scientific name of woody invasive species | Forest area affected (000 ha) | |
|---|-------------------------------|-------|
| | 2005 | 2010 |
| Amorfa fruticosa | 20.15 | 22.96 |
| Robinia pseudoacacia | 11.57 | 11.96 |
| N/A | N/A | N/A |
| Total | 31.72 | 34.92 |

Tiers

| Category | Tier for status | Tier for reported trend |
|----------|-----------------|-------------------------|
|----------|-----------------|-------------------------|

| | | |
|------------------|--------|--------|
| Invasive species | Tier 1 | 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 | Area of <i>Amorfa fruticosa</i> is estimated on the basis of 1st age class of state owned common oak (<i>Quercus robur</i>) and narrow-leaved ash (<i>Fraxinus angustifolia</i>) forests which are potentially threatened by <i>Amorfa fruticosa</i> . We used black locust area inside natural forests with a tendency to expand and suppress natural forests as area affected by black locust (<i>Robinia pseudoacacia</i>). More information on invasive species can be found on www.invazivnevrste.hr . According to information from the State Institute for Nature Protection, list of invasive species is still under construction. | N/A |

Other general comments to the table

N/A

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 | Ministry of Agriculture, Register of Forest Fires | Burned area, number of fires | 2003-2012 | N/A |
| 2 | Croatian Forest Research Institute, Reports and forecasts on harmful organisms in forests | Outbreaks of insects, diseases and severe weather events | 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 |
|----------------|------------|
| N/A | N/A |

8.2.3 Original data

| Category | Area (ha) and number of fires | | | | | | | | | | | |
|---|-------------------------------|-----|-------|-----|-------|-----|--------|-----|--------|-----|--|--|
| | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | | |
| | ha | No. | ha | No. | ha | No. | ha | No. | ha | No. | | |
| Total land area burned | 27.091 | 532 | 3.378 | 204 | 3.135 | 147 | 4.575 | 181 | 20.209 | 345 | | |
| *Forest area burned | 8.267 | N/A | 355 | N/A | 377 | N/A | 506 | N/A | 5.219 | N/A | | |
| Category | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | | |
| | ha | No. | ha | No. | ha | No. | ha | No. | ha | No. | | |
| Total land area burned | 7.343 | 275 | 2.900 | 181 | 1.122 | 181 | 15.555 | 280 | 24.804 | 569 | | |
| *Forest area burned | 1.470 | N/A | 886 | N/A | 339 | N/A | 2.311 | N/A | 7.269 | N/A | | |
| | | | | | | | | | | | | |
| *Forest area not including degraded forms (scrubland, maquies, garigues) and productive forest land without tree cover. | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

8.3 Analysis and processing of national data

8.3.1 Adjustment

| |
|--|
| |
|--|

8.3.2 Estimation and forecasting

| |
|--|
| |
|--|

8.3.3 Reclassification

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 | 27.091 | 532 | 5.323 | 204 | 3.135 | 147 | 4.575 | 181 | 20.209 | 345 |
|  | ... of which forest area burned | 8.267 | N/A | 0.355 | N/A | 0.377 | N/A | 0.506 | N/A | 5.219 | N/A |
| Category | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | |
| | | 000 ha | # | 000 ha | # | 000 ha | # | 000 ha | # | 000 ha | # |
|  | Total land area burned | 7.343 | 275 | 2.9 | 181 | 1.122 | 181 | 15.555 | 280 | 24.804 | 569 |
|  | ... of which forest area burned | 1.47 | N/A | 0.886 | N/A | 0.339 | N/A | 2.311 | N/A | 7.269 | N/A |

Table 8b

| Outbreak category | Description/name | Year(s) of latest outbreak | Area damaged (000 hectares) |
|-------------------|--|----------------------------|-----------------------------|
| 1 | Gypsy Moth (<i>Lymantria dispar</i>) | 2012 | 1.97 |
| 1 | Mottled Umber (<i>Erannis defoliaria</i>) and Winter Moth (<i>Operophtera brumata</i>) | 2012 | 3.76 |
| 2 | Powdery Mildew (<i>Microsphaera alphitoides</i>) | 2012 | 8 |
| 3 | Snow-breaks and windfalls | 2012 | 2.14 |
| 3 | Frost | 2012 | 21.12 |
| 3 | Drought | 2012 | 3.34 |
| 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 |

| 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 | Tier 3 | Tier 3 |

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 | Gradation of Gypsy Moth (<i>Lymantria dispar</i>), occurs periodically, every 8-12 years. We successfully keep it under control because Gypsy Moth is native pest in Croatia. We treat it with biological insecticides. | Extreme outbreaks were in 2005 (33.245 ha), 2006 (19.933 ha)... 2013 (around 29.000 ha). |
| Insects | N/A | N/A |

| | | |
|-----------------------|--|-----|
| Diseases | Powdery Mildew (<i>Microsphaera alphitoides</i>) occurs every year. We treat it on oak seedlings and young plants by fungicides. | N/A |
| Severe weather events | Snow-breaks and windfalls occur every year, but do not have the elements of natural disaster. | 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 | 45.93 |

Tiers

| Category | Tier for reported trend |
|---------------------------|-------------------------|
| Reduction in canopy cover | Tier 2 |

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

| |
|--|
| |
|--|

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 | National Forest Policy and Strategy (OG 120/2003) | N/A | N/A | N/A |
| 2 | Forest law (OG NN 140/05, 82/06, 129/08, 80/10, 124/10, 25/12, 68/12) | N/A | N/A | N/A |
| 3 | N/A | N/A | N/A | N/A |
| 4 | N/A | N/A | N/A | N/A |

10.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

10.2.3 Original data

| |
|--|
| |
|--|

10.3 Data

Table 10

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

10.4 Comments

| Variable / category | Comments related to data definitions etc |
|--|--|
| Policies supporting sustainable forest management | Not applicable for sub-national level. |
| Legislation and regulations supporting sustainable forest management | Not applicable for sub-national level. |

Other general comments

| |
|--|
| |
|--|

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 | Code of consultation with the interested public in enacting laws, regulations and acts | 2009 | Official Gazette no. 140/09 |
| 2 | Ministry of Public Administration | N/A | web pages (www.uprava.hr) |
| 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 |
|--|-----|

11.3 Comments

| Category | Comments related to data definitions etc |
|----------|--|
|----------|--|

| | |
|-------------------------------|--|
| National stakeholder platform | <p>Consultation and public participation in the legislative process is carried out for the purpose of gathering information about the interests, opinions and suggestions of the interested public regarding certain public policies. It is aimed at raising the level of understanding and acceptance of the policy objectives, and identifying weaknesses and negative effects of public policy that should be eliminated on time. The Code of consultation with the interested public in enacting laws, regulations and acts establishes general principles, standards and measures for consultation with the interested public in procedures of adopting laws, other regulations and acts of state bodies, which regulate the issues and take positions of general welfare (protection and promotion of human rights, civil service, the judiciary, environmental protection, etc.). The ultimate goal of the Code is to facilitate interaction with citizens and representatives of the interested public in the democratic process and to encourage the active participation of citizens in public life. More information can be found on: http://www.uzuvrh.hr/userfiles/file/code%20of%20practice%20on%20consultation-croatia_final.pdf and http://www.uprava.hr/default.aspx?id=13276</p> |
|-------------------------------|--|

Other general comments

| |
|--|
| |
|--|

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 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993. | Production forests, protection forests, forest with special purposes | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1996. | Production forests, protection forests, forest with special purposes | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006. | Production forests, protection forests, forest with special purposes | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd. | Production forests, protection forests, forest with special purposes | 2006 | N/A |

12.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

12.2.3 Original data

12.3 Analysis and processing of national data

12.3.1 Adjustment

12.3.2 Estimation and forecasting

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 | 1920 |
|  | ... of which permanent forest estate | 1920 |

Tiers

| Category | Tier for status |
|---|-----------------|
| Forest area intended to be in permanent forest land use | Tier 2 |
| Permanent forest estate | Tier 2 |

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 | According to Forest Law, all forests are treated as permanent forest good. Considering there are some other forest areas (clearings) that are anticipating afforestation, additional increase in forest area can be expected. |

Other general comments

| |
|--|
| |
|--|

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 | Croatian Forests Ltd., Forest management Plan of the Republic of Croatia, Zagreb, 2006 | Forest area monitored under a national forest monitoring framework, Forest reporting at national scale, Criteria and Indicators reporting | 2006-2015 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 2 | The State of the Environment Report | Forest reporting at national scale, Periodic national state of the forest report | 2007, 2005-2008 | N/A |
| 3 | Environmental Protection Act (Official Gazette No. 80/13).; Nature Protection Act (Official Gazette No. 80/13) | Forest reporting at national scale, Periodic national state of the forest report | N/A | N/A |
| 4 | Biodiversity of Croatia, State Institute for Nature Protection Ministry of Culture – Republic of Croatia Zagreb, 2009 | Forest reporting at national scale, Other | 2009 | 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 | 2013 | yes | no | no | yes | no | 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 | yes |
| 2 Periodic national state of the forest report | yes |
| 3 Other (please document) | yes |
| 4 None | no |

Other type of forest reporting

Publication "Biodiversity of Croatia"

13.4 Comments

| Category | Comments |
|-----------------------------------|---|
| Criteria and Indicators reporting | This type of forest reporting is performed through Forest Management Plans. They are made for 10 year periods and every year 10% of Forest Management Plans are reviewed. |

| | |
|---|---|
| Periodic national state of the forests report | <p>"The State of the Environment Report", made for a four years period, is one of the fundamental environmental protection documents of the Republic of Croatia. The Report gives an overview and evaluation of the country's overall state of the environment, including the assessment of the effectiveness of environmental measures implemented in the observed period. Legal framework and the process of preparing the State of the Environment Report of the Republic of Croatia. The preparation of the Report is laid down by the Environmental Protection Act (Official Gazette No. 80/13). "The State of Nature Report" is made for a period of five years, and includes among other things, an analysis of threat, vulnerability, and the reasons for the problems of protection of ecosystems, habitats and wildlife, and geodiversity, and evaluation of their state. Legal framework and the process of preparing the State of the Environment Report of the Republic of Croatia. The preparation of the Report is laid down by the Nature Protection Act (Official Gazette No. 80/13)</p> |
| Other | <p>"Biodiversity of Croatia" provides overview of Croatian biodiversity with basic information on threatened flora and fauna species as well as habitats. The publication is divided into three major chapters - wild and domesticated taxa, habitats and important sites.</p> |

Other general comments

In table 13a "Forest Inventory" refers to inventory in order to develop Forest Management Plans. 10% of all area is measured every year.

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 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993. | Production forests, protection forests, forest with special purposes | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest Management Plan of Republic of the Croatia, Zagreb, 1996. | Production forests, protection forests, forest with special purposes | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006. | Production forests, protection forests, forest with special purposes | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd., Map of forest cover, M 1:5000, Zagreb, 2006. | Production forests, protection forests, forest with special purposes | 2006, 2010 | N/A |

14.3 Data

Table 14a

| Forest plan type | Forest area 2010 (000 ha) |
|----------------------------------|---------------------------|
| Forest area with management plan | 1489 |
| ... of which for production | 1470 |

| | |
|-------------------------------|----|
| ... of which for conservation | 19 |
|-------------------------------|----|

Table 14b

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

Table 14c

| | |
|---|----|
| Percent of area under forest management plan that is monitored annually | 10 |
|---|----|

Tiers

| Category | Tier for status |
|---|-----------------|
| Forest area with management plan | Tier 1 |
| Percent of area under forest management plan that is monitored annually | Tier 1 |

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 | Only area with detailed management plans (on the management unit level) is reported under this category. All forests in Croatia are covered with General Forest Management Plan for the whole country. |
| Percent of area under forest management plan that is monitored annually | The percentage refers to the area of the planned cultivation works, forest protection works and logging for a particular year, although the monitored area is probably higher. |
| N/A | N/A |

Other general comments

The average area of management unit is 2.519 ha, or 1.773 ha of forests according to FRA criteria.

There are two types of forest management plans: General Forest Management Plan for the Republic of Croatia and management plans for the management units. General Forest Management Plan includes all forests and other forest lands in the country. It also contains information on all management units and management plans.

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 | no |

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 |
|--|---|
| Type of stakeholder inputs - Tier for status | Tier for status is 1: Other, because stakeholders inputs are documented and kept by Croatian forests Ltd. |
| N/A | N/A |
| N/A | N/A |

Other general comments

| |
|--|
| |
|--|

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 | 1324 | 1324 | 1323 | 1323 | 1322 |
|  | PEFC | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|  | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | |
|  | FSC | 1322 | 1322 | 1321 | 1321 | 1321 | 1320 | |
|  | PEFC | 0 | 0 | 0 | 0 | 0 | 0 | |
|  | 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 | Data were taken from the FSC database, however, other wooded land is included in FSC data, as well as other areas that are not defined as forest by FRA definition, therefore we adjusted the FSC data to the FRA criteria. |
| Domestic forest management certification | N/A |

Other general comments

| |
|--|
| |
|--|

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"> • Goods : roundwood; sawnwood; biomass; woodbased panels; pulp and paper and non-wood forest products. • Services : 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 | Ministry of Finance, Department for Budget Execution, 2008 | Forest revenue | 2000, 2005 | N/A |
| 2 | Croatian Parliament: Annual State Budget Execution Report, 2006 | Public expenditure | 2005 | N/A |
| 3 | Croatian Parliament; Annual State Budget Execution Report, 2011 | Public expenditure | 2010 | N/A |
| 4 | Ministry of Finance, 2013 | Forest revenue | 2010 | N/A |
| 5 | Ministry of Agriculture, 2013 | Forest revenue | 2005 | N/A |
| 6 | Ministry of Regional Development and EU Funds | Forest revenue | 2010 | N/A |

17.3 Data

Table 17

| Category | Revenues / expenditures (000 local currency) | | |
|----------------|--|------|-------|
| | 2000 | 2005 | 2010 |
| Forest revenue | 3750 | 4730 | 11249 |

| | | | |
|--------------------------------|---------------------|------|--------|
| Public expenditure on forestry | N/A | 4709 | 101589 |
| | 2000 | 2005 | 2010 |
| Name of Local Currency | Croatian kuna (HRK) | N/A | N/A |

17.4 Comments

| Category | Comments related to data definitions etc |
|--------------------------------|--|
| Forest revenue | Includes payments from Hrvatske šume Ltd. into the State Budget (only in 2000) and concession fees and rents for state hunting areas (only for 2005 and 2010, since 2000 data are not available). It does not include public timber sales revenue or taxes on domestic trade and export of forest products. |
| Public expenditure on forestry | Data on personnel, materials and operating costs are not included since they are not available. Increase in 2010 expenditures is due to state aid for competitiveness development of the wood industry sector, and also due to financing of Forestry Extension Service, which was operating from 2007 to 2010. |
| Other general comments | N/A |

Other general comments

| |
|--|
| |
|--|

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 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1993 | Area of public and private forests | 1986 | Plans from 1986 to 1995. Data valid for 01.01.1986. |
| 2 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 1996 | Area of public and private forests | 1996 | Plans from 1996 to 2005. Data valid for 01.01.1996. |
| 3 | Croatian Forests Ltd., Forest Management Plan of the Republic of Croatia, Zagreb, 2006 | Area of public and private forests | 2006 | Plans from 2006 to 2015. Data valid for 01.01.2006. |
| 4 | Croatian Forests Ltd., Map of Forest Cover, M 1:5000, Zagreb, 2006 | Area of public and private forests | 2006,2010 | N/A |
| 5 | Croatian Forests Ltd. | Area of public and private forests | 2010 | Validated management plans for management units |

18.2.2 Classification and definitions

| National class | Definition |
|-------------------|--|
| State ownership | Corresponds to FRA definition of public ownership. |
| Private ownership | Same as FRA definition. |
| N/A | N/A |
| N/A | N/A |

18.2.3 Original data

| Forests and other forest land owned by the State: | | | |
|---|-----------|---------|---------|
| National classes | Area (ha) | | |
| | 1986 | 1996 | 2006 |
| Forest (stocked forest land) | 1604147 | 1624155 | 1827311 |
| a) high forest, plantation and coppice | 1371341 | 1313897 | 1361421 |

| | | | |
|--|--------|--------|--------|
| b) scrubland | 232806 | 310258 | 465890 |
| Other forest land (unstocked forest land) | 395159 | 400319 | 279605 |
| a) Productive forest land without tree cover | 314230 | 324359 | 202680 |
| b) Non-productive forest land without tree cover | 16949 | 14598 | 32502 |
| c) Barren wooded land | 63980 | 61362 | 44423 |

Forests and other forest land privately owned:

| National classes | Area (ha) | | |
|--|-----------|--------|--------|
| | 1986 | 1996 | 2006 |
| Forest (stocked forest land) | 457362 | 454134 | 575471 |
| a) high forest, plantation and coppice | 454002 | 434446 | 528217 |
| b) scrubland | 3360 | 19688 | 47254 |
| Other forest land (unstocked forest land) | 980 | 7003 | 6299 |
| a) Productive forest land without tree cover | 936 | 6975 | 5785 |
| b) Non-productive forest land without tree cover | 12 | 20 | 450 |
| c) Barren wooded land | 32 | 8 | 64 |

Total forests and other forest land:

| National classes | Area (ha) | | |
|------------------|-----------|------|------|
| | 1986 | 1996 | 2006 |
| | | | |

| | | | |
|--|---------|---------|---------|
| Forest (stocked forest land) | 2061509 | 2078289 | 2402782 |
| a) high forest, plantation and coppice | 1825343 | 1748343 | 1889638 |
| b) scrubland | 236166 | 329946 | 513144 |
| Other forest land (unstocked forest land) | 396139 | 407322 | 285904 |
| a) Productive forest land without tree cover | 315166 | 331334 | 208465 |
| b) Non-productive forest land without tree cover | 16961 | 14618 | 32952 |
| c) Barren wooded land | 64012 | 61370 | 44487 |

18.3 Analysis and processing of national data

18.3.1 Adjustment

Calibration is not necessary.

18.3.2 Estimation and forecasting

Reclassification of forest areas is made as in Question 1. Only the areas that correspond with FRA categories are included into national classes (according to ownership). After that, linear interpolation was made for the reference years.

| National classes (forest according to FRA criteria) | Area (ha) | | |
|---|----------------|----------------|----------------|
| | 1986 | 1996 | 2006 |
| State ownership | 1420280 | 1359176 | 1416135 |
| Private ownership | 454030 | 434470 | 528699 |
| TOTAL | 1874310 | 1793646 | 1944834 |

| National classes (forest according to FRA criteria) | Area (ha) | | |
|---|----------------|----------------|----------------|
| | 1990 | 2000 | 2005 |
| State ownership | 1399774 | 1397701 | 1396665 |
| Private ownership | 449999 | 487334 | 506000 |
| TOTAL | 1849773 | 1885035 | 1902665 |

18.3.3 Reclassification

Reclassification is not necessary regarding that FRA categories correspond to national classes .

18.4 Data

Table 18a

| Categories | | Forest area (1000 hectares) | | | |
|---|--|-----------------------------|------|------|------|
| | | 1990 | 2000 | 2005 | 2010 |
|  | Public ownership | 1400 | 1398 | 1397 | 1376 |
|  | ... of which owned by the state at national scale | 1400 | 1398 | 1397 | 1376 |
|  | ... of which owned by the state at the sub-national government scale | 0 | 0 | 0 | 0 |
|  | Private ownership | 450 | 487 | 506 | 544 |
|  | ... of which owned by individuals | 450 | 487 | 506 | 534 |
|  | ... of which owned by private business entities and institutions | 0 | 0 | 0 | 10 |

| | | | | | |
|---|--|---------|---------|---------|---------|
|  | ... of which owned by local, tribal and indigenous communities | 0 | 0 | 0 | 0 |
|  | Unknown ownership | 0 | 0 | 0 | 0 |
| TOTAL | | 1850.00 | 1885.00 | 1903.00 | 1920.00 |

Tiers

| Category | Tier for status | Tier for reported trend |
|-------------------|-----------------|-------------------------|
| 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 | 1400 | 1398 | 1397 | 1376 |
| Individuals | 0 | 0 | 0 | 0 |
| Private companies | 0 | 0 | 0 | 0 |
| Communities | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 |
| TOTAL | 1400.00 | 1398.00 | 1397.00 | 1376.00 |

| Category | Tier for reported trend | Tier for status |
|-----------------------|-------------------------|-----------------|
| Public Administration | Tier 2 | Tier 2 |

| | | |
|-------------------|--------|--------|
| Individuals | Tier 2 | Tier 2 |
| Private companies | Tier 2 | Tier 2 |
| Communities | Tier 2 | Tier 2 |
| Other | Tier 2 | Tier 2 |

18.5 Comments

| Category | Comments related to data definitions etc | Comments on the reported trend |
|-------------------|--|--|
| Public ownership | N/A | A light decrease in public forests proportion can be noticed due to returning of a part of forests to the persons from whom it was nationalised in 1945. This trend will continue. After 2005, a part of forest areas was returned to the Church. |
| Private ownership | N/A | A rise in proportion of private forests can be explained by the following: - more forests are covered with new forest measurement for the Forest Management Plan 2006, than it was for the previous plans, - returning of nationalised forest areas to the persons and their successors. |
| Unknown ownership | N/A | N/A |
| Management rights | N/A | N/A |

Other general comments to the table

N/A

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 | Public enterprise for the management of forests and forestlands in the Republic of Croatia: Hrvatske šume. Business report of Hrvatske šume for the year 1996, Zagreb, 1997. | 1990 | N/A | N/A |
| 2 | Public enterprise Hrvatske šume: 2000 Annual report, Zagreb, | 2000 | N/A | N/A |
| 3 | Hrvatske šume Ltd.: 2005 Annual report, Zagreb | 2005 | N/A | N/A |
| 4 | Hrvatske šume Ltd.: 2010 Annual report, Zagreb | 2010 | N/A | N/A |

19.2.2 Classification and definitions

| National class | Definition |
|----------------|------------|
| N/A | N/A |

19.2.3 Original data

Note to table 19.2.1

All national classifications and definitions for employment correspond with FRA classifications and definitions.

| Categorie | 1990 | 2000 | 2005 |
|-----------------------|-------|------|------|
| Production workers | n.a. | 5050 | 4308 |
| Unskilled attendants | n.a. | 299 | 273 |
| 1. First-hand workers | | 5349 | 4581 |
| Expert personnel | n.a. | 3195 | 3215 |
| Unskilled attendants | n.a. | 1364 | 1297 |
| 1. Overhead workers | | 4459 | 4512 |
| A + B | n.a. | 9908 | 9093 |
| Forest inventory | 0 | 0 | 2 |
| TOTAL | 14296 | 9908 | 9095 |

19.3 Data

Table 19

| Category | | Employment (000 years FTE) | | | |
|---|------------------------|----------------------------|-------|-------|-------|
| | | 1990 | 2000 | 2005 | 2010 |
|  | Employment in forestry | 14.296 | 9.908 | 9.095 | 8.634 |
|  | ... 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 | <p>The data for 1990 are repeated from FRA 2005. The 2000 and data refers to all "Hrvatske šume" employees that participate in primary production of goods. Those are employees in production of industrial roundwood fuelwood and non-wood forest products; silvicultural activities, Christmas trees production, forest inventory, forest management consulting services, timber value assessments, forest fire fighting and protection, forest pest control, harvesting and transport of logs within the forest and administrative staff. There are no data for other forest owners. All employees, except employees on Forest Inventory, are counted as full-time equivalents (FTE) because there are no reliable data on the number of half-time employees.</p> | N/A |
|------------------------|--|-----|

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) | 1229 | kuna | 2009 |

20.3 Comments

| Category | Comments |
|---|----------|
| Gross value added from forestry (at basic prices) | N/A |

Other general comments

| |
|--|
| |
|--|

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

| |
|--|
| |
|--|