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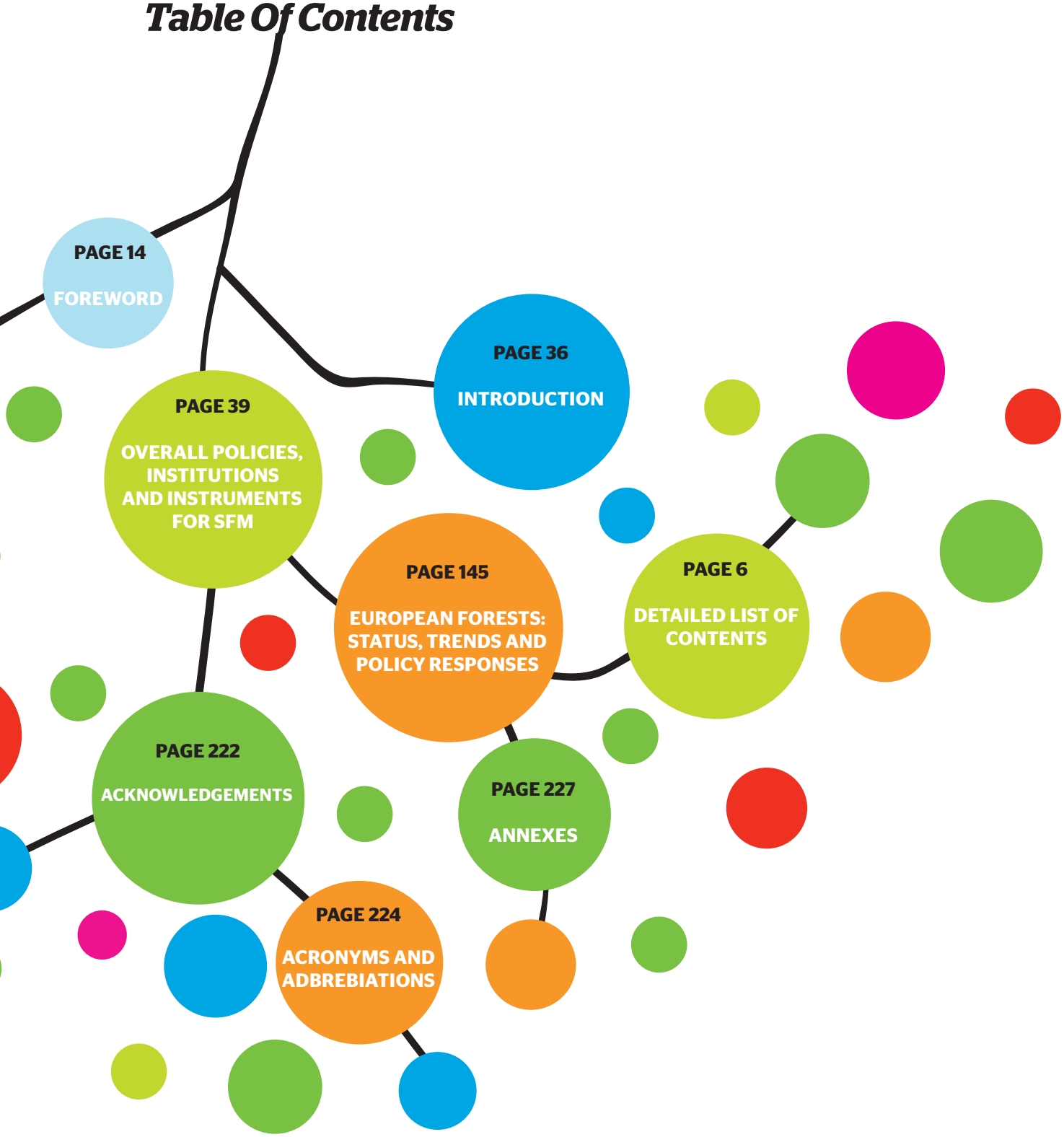

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Foreword

Forests are key to fulfilling the long-term objectives of sustainability in European societies. Moreover, sustainable forest management is crucial to ensuring the ecological, economic and social functions provided by forests and presents important opportunities for addressing current challenges at global, regional and national levels.

Evidence-based information on the status and trends in forests and forest management is crucial for sound policy-making, dialogue and communication with other forest-related sectors and society. Furthermore, we in Spain firmly believe that up-to-date forest policy can make a key contribution to the sustainability and well-being of our citizens, both city dwellers and, particularly, those who live in rural communities.

Given that 2015 is the 25th anniversary of the establishment of FOREST EUROPE, we would like to highlight the fact that the Pan-European Criteria and Indicators have proved to be a very helpful tool in providing solid information as basis for decision-making over the years. Therefore I am certain that this new edition of the "State of Europe's Forests" will contribute to facilitating fruitful discussions on forests and their sustainable management in the pan-European region between policymakers, the private sector and civil society.

I would like to thank all of the individuals, organizations and countries that contributed to the development and publication of this fourth edition of the "State of Europe's Forests". This report is the product of the efforts and excellent collaboration of a number of organizations and experts. It is imperative that we strive to maintain this collaboration in the future as it has proved very valuable in strengthening co-operation in the pan-European region in recent years.

Isabel García Tejerina
Minister of Agriculture, Food and the Environment
Chair of FOREST EUROPE 2011-2015

Preface

Given that 2015 is the 25th anniversary of FOREST EUROPE, this report offers an ideal opportunity to take stock and analyze the trends in European forests over the last two-and-a half decades.

Since 1990, the Ministerial Conference for the Protection of Forests in Europe, now known as FOREST EUROPE, has facilitated an open and inclusive policy dialogue between governments, governmental organizations, non-governmental organizations, civil society and the private sector, which addresses common challenges and opportunities relating to forests in Europe.

By providing detailed information about the current status of European forests and the associated trends over the last 25 years, this report aims to stimulate debate on the role of forests in society and the implementation of sustainable forest management in the region.

Among other things, the report reveals that Europe's forest area expanded to 215 million ha or 33 percent of the region's total land area over the last 25 years and continues to expand. In addition to forest area, the growing stock is also increasing. European forests have a higher average density of growing stock than global forests.

The productive role of our forests is also worthy of mention. Europe remains one of the world's biggest producers of equivalent roundwood. The value of marketed non-wood goods, which sometimes provide an important source of income at local level, is also significant.

As highlighted by their contribution to Europe's gross domestic product (GDP), which amounts to EUR 103 million annually, the socio-economic functions of the forest play an important role in the region's economy. It is interesting to note here that Europe has moved from being a net importer of primary wood and paper products to a net exporter.

For these reasons, enhancing the role of sustainable forest management in the context of a green economy, including the promotion of green jobs in forests, is crucial to the social and economic development of Europe.

European forests also play a role in tackling current challenges like climate change: they remove large amounts of CO_2 from the atmosphere. Between 2005 and 2015 the average annual sequestration of carbon in forest biomass, soil and forest products reached 719 million tonnes. The increasing awareness of this issue is reflected in the most frequently mentioned policy objectives, i.e. carbon stocks, stock changes, and climate change mitigation and adaptation.

The issues on which European forest policy should focus include enhancing the protection of forests to ensure that they can fulfil important environmental roles,and strengthening cooperation at regional level while promoting pan-European and national action.

Despite the achievements of the last 25 years, indicated, not least, by the fact that the number of countries with a national forest programme has almost tripled since 2007, raising awareness of sustainable forest management, research, education and training remain crucial to the success of the forest sector.

I trust that this report will boost the debate on all forest-relevant issues in the pan-European region so that policy-makers can rely on evidence-based information on the status and trends in forest and forest management in their work. This information can also serve as a source of knowledge for decision-makers.

I would like to acknowledge the contributions and work of the national correspondents and the 300 national experts who provided the information required for this report, and the 60-plus authors and reviewers who cooperated to produce the State of Europe's Forests 2015. I owe them all a sincere debt of gratitude.

María Tourné Whyte
Head of the Liaison Unit Madrid

Summary for Policy Makers

The Summary for Policy Makers is a brief document based on information included in the "State of Europe's Forests 2015"report. This document offers a comprehensive overview of European forests, their current status, trends and policy responses related to them, as well as an insight into sustainable forest management (SFM) in Europe.

The State of Europe's Forests 2015 report will, along with other publications, serve as background information for political discussions on future opportunities and challenges, and the associated political responses. This report is focused on the current status and trends (10-year trends and 25-year trends) of European forests and sustainable forest management in the period 1990-2015 and has been prepared for the 7th Ministerial Conference on the Protection of Forests in Europe, held in Madrid on 20-21 October 2015.

The State of Europe's Forests 2015 report is organised in two parts. The first part (Overall Policies, Institutions and Instruments for Sustainable Forest Management) provides general information about the way forests are governed in a country through the policies, institutions and instruments for SFM. These aspects are covered by five Qualitative[1] Indicators, and changes reported in these indicators over time reflect the responses of policy makers to challenges and opportunities related to forests and SFM. The second part (European Forests: Status, Trends and Policy Responses) has been prepared following the Advisory Group recommendations and on the basis of data gleaned from the 35 Quantitative Indicators, which provide information on the current status and changes in European forests and progress on SFM, and from the 12 Qualitative Indicators, which shed light on the policies, institutions and instruments used to address specific policy areas related to the afore mentioned Quantitative Indicators. This second part is structured according to the Six Criteria for SFM and includes the respective Quantitative Indicators and Qualitative Indicators directly related to them.

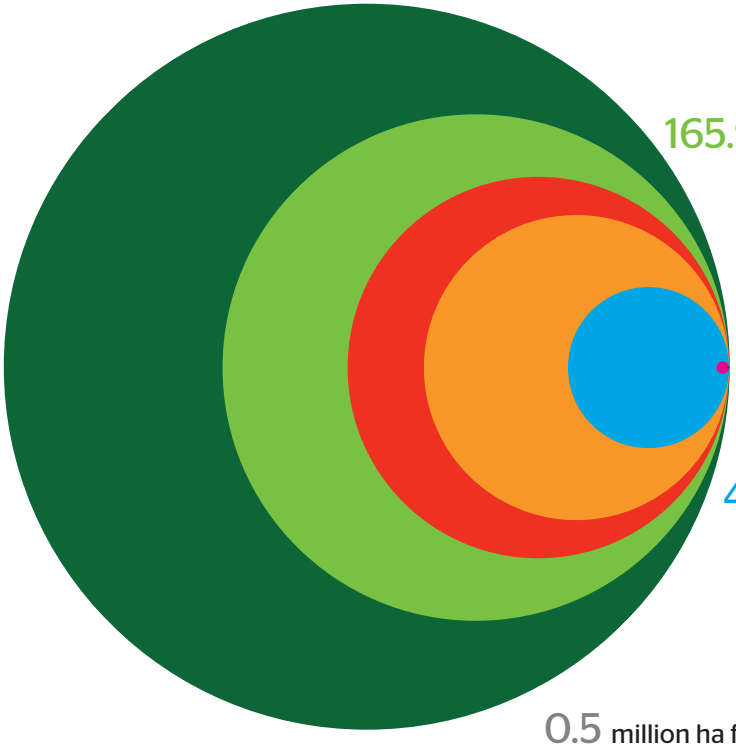
The Output Tables included in the Annexes display the information on Quantitative Indicators reported by 34 signatory countries, the information included in the 11 desk studies carried out by UNECE/FAO Forestry and Timber Section, and the information reported by the Russian Federation for the previous edition of the State of Europe's Forests report. Given the lack of comparable current data from the Russian Federation and in order to maintain the internal consistency of the report, the information provided by the Russian Federation in 2011 is not included in the analysis or the graphs.

[1] SFM Qualitative Indicators are split in two groups: group A (five indicators) provides general information about the forest are governed in a country, group B (12 indicators) provides information about policies, institutions and instruments used to address specific topics.

Reference: EFI (2012) based on NFI data and EC-JRC forest map. Modified by LUM

State of Europe's Forests 2015

European forests play an important role in environmental functions, crucial for our wellbeing, as fighting climate change, conserving biological diversity, protecting soils or preserving water resources. Furthermore, the productive role of European forests has a relevant value producing also significant socio-economic benefits



215 million ha total forest area

165.9 million ha available for wood supply

112.95 million ha coniferous forest

90.36 million ha broadleaves forest

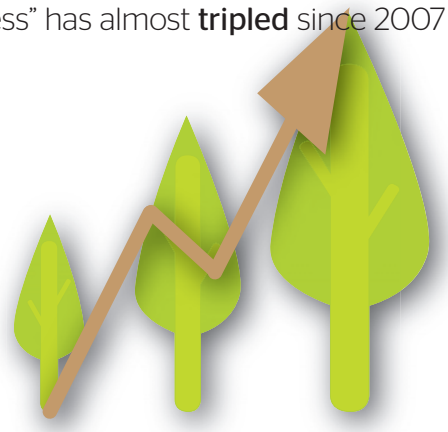
47.69 million ha mixed-species forest

3.7 million ha damage forest

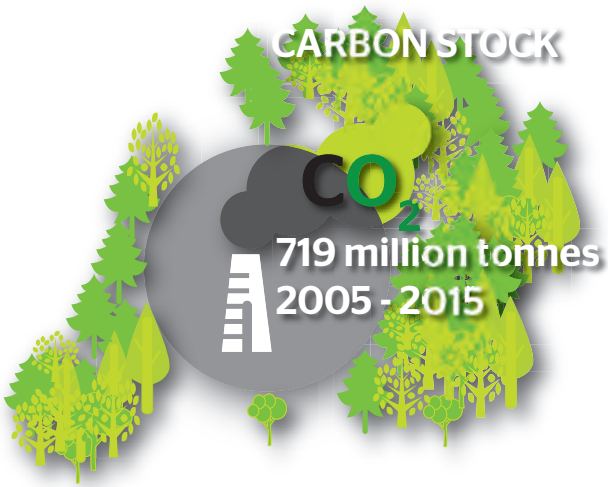
0.5 million ha forest primarily damaged by fire

Forests cover **33%** of **Europe's total land area** and **forest area continues to increase**

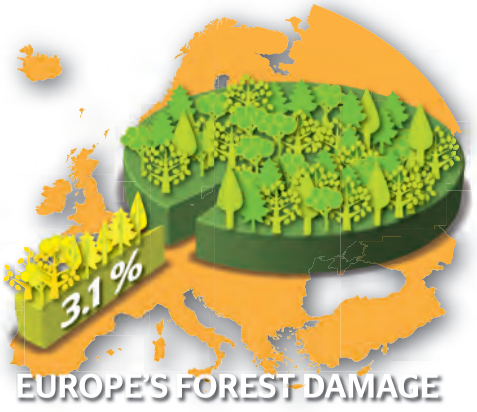
The **number of countries** with a "formal National Forest Programme (NFP) process" has almost **tripled** since 2007



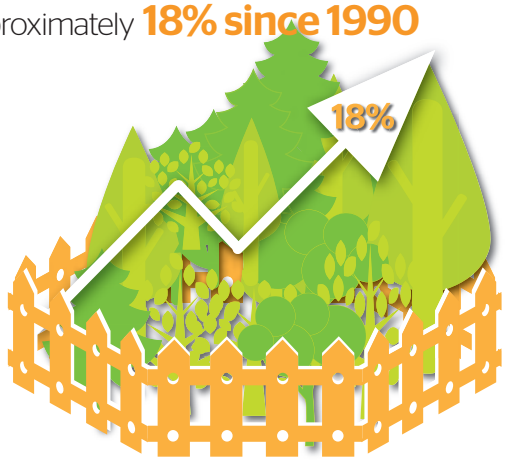
The average annual sequestration of carbon in forest biomass between 2005 and 2015 reached **719 million tonnes CO_2**



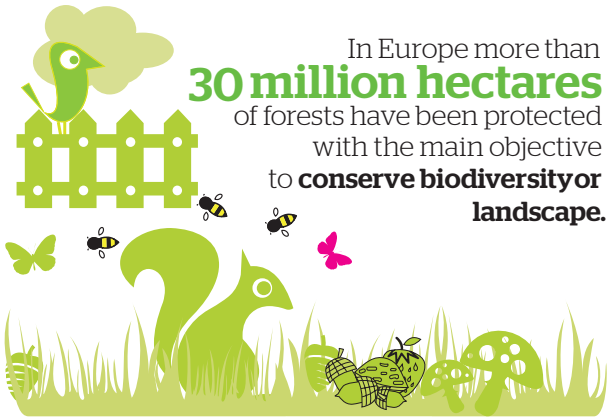
3.7 million ha of Europe's forests are **affected by forest damage,** most frequently caused by biotic agents



The number of **private forest holdings has increased** by approximately **18% since 1990**



Forest Policy has a strong focus on **biodiversity**



In Europe more than **30 million hectares** of forests have been protected with the main objective to **conserve biodiversity or landscape.**

More than 110 million ha of forests in Europe are designated for the protection of water, soil and ecosystems, as well as the protection of infrastructures, managed natural resources and other services.

Most reporting countries identified soil protection as a main policy objective. About a third of the reporting countries identified protection of water as a priority

90% of forest and other wooded land reported as being **available for recreational purposes**

Gross value added by the forest sector amounted to **€103 billion** (0.8% GDP in the region)

Research, education and training are crucial for the success of the forest sector

Overall policies, institutions and instruments for SFM

This chapter provides general information about the way forests are governed in the FOREST EUROPE signatories through policies, institutions and instruments for Sustainable Forest Management (SFM). These are covered by 5 Qualitative Indicators (Part I of pan-European Qualitative Indicators). Changes reported in these indicators over time reflect the responses of policy makers to challenges and opportunities related to forests and SFM.

A1. National Forest Programme (NFP) or similar and related forest policies

Thirty-two countries from the FOREST EUROPE region reported to have a National Forest Programme process in their country in 2014. The number of countries with a "formal NFP process" has almost tripled since 2007. Significant changes in NFP processes since 2011 mainly concern amendments or updates to address either the economic crisis or issues of implementation. While it is widely acknowledged that NFPs have encouraged broad participation, facilitating adoption and implementation of policies and strategies, they have been less successful in intersectoral coordination and integration of forest matters in broader development goals, which remains an issue.

A forest policy document such as "forest strategy", "forest policy" etc. (be it a law or not) exists in practically all FOREST EUROPE countries, about half of which were developed through NFP processes and /or are endorsed at high political levels.

A2. Institutional frameworks

Since 2011, significant changes related to institutional frameworks have been undertaken in 17 out of the 34 countries reporting. Forestry administration units continue to be merged with bodies responsible for natural resources, rural development and nature conservation. In most countries, the management of public forests is the responsibility of a separate body, usually a publicly-owned state forest enterprise(s). The number of forest-related public staff reported in 2014 is about 14% less than figures reported in the SoEF 2011. Around 220,000 people work in forest-related public organizations in Europe, primarily in the management of public forests. High numbers of public forest management staff are employed in countries with large areas of public forests, where citizens expect a high level of social services from forests.

A3. Legal/regulatory frameworks and international commitments

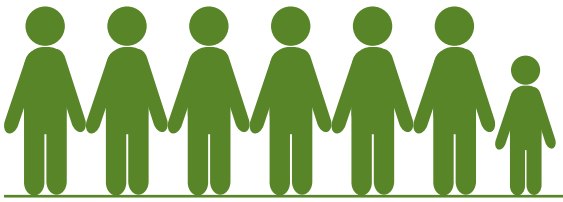
In most FOREST EUROPE countries, forest laws currently in force are usually less than five years old. Nearly half of the reporting signatories (15 out of 34) have amended their legal and regulatory frameworks since 2011. The most frequent amendments to legal/regulatory frameworks address issues concerning the governance of land use change. With regard to international commitments, the majority of the signatories (20 out of 34) reported domestic policy and legal changes in the wake of international commitments such as the EU's Timber Regulation and FOREST EUROPE Oslo Ministerial Decision and Resolutions.

A4. Financial instruments and economic policy

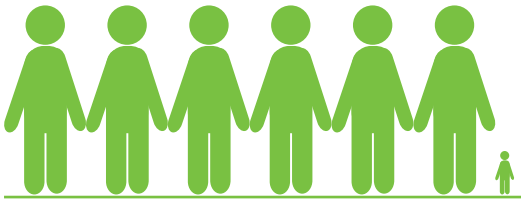
The majority of FOREST EUROPE reporting signatories (23 out of 34) have reported no changes in the national economic policy on forests (public or private) since 2011. In nearly half of the reporting signatories (16 out of 34), management of state-owned forests is financially self-sufficient or profit oriented. As reported by 23 countries, total public expenditure on all forest-related activities was €3,234,750,019 in the last reporting period. On average, this total sum would amount to around €17.90/ha of total public expenditure on forest and other wooded land per year. Subsidies are the most frequently used financial instrument to influence private forest management (used by 22 out of 34 signatories). Transfer payments are most frequently used for the conservation of forest biodiversity, followed by support of forest inventory and planning and protection of soil and water.

A5. Informational means

Most reporting signatories (31 out of 34) provided access to forest inventory data. More than one-third of countries had a written (governmental) forest-related outreach and communication strategy. Social media is used by an increasingly large number of countries in the pan-European region to strengthen forest communication.



674,802,300
TOTAL POPULATION OF EUROPE



623,861,600
PEOPLE LIVING IN COUNTRIES WHOSE FORESTS ARE COVERED BY A NATIONAL FOREST PROGRAMME (NFP) OR SIMILAR (IND. A1)

616,598,200
PEOPLE WHO HAVE ACCESS TO FOREST INVENTORY DATA (IND. A5)

Forest Resources and their Contribution to Global Carbon Cycles

Forests cover more than one third of Europe`s land surface, and forest area continues to increase

Forest area amounts to 215 million ha in Europe, accounting for 33% of total land area, which is heterogeneously distributed among countries. Other wooded lands cover an additional area of 36 million ha. In Europe, the most forested region is Northern Europe (53%), while South-East Europe is the least forested region (23%). In comparison to other regions in the world, only South America has a higher percentage of forest cover (49%) than Europe (FRA 2010). 45% of European forests are predominantly coniferous, 36% are predominantly broadleaved, and the rest are mixed.

Around 80% of the forest area is available for wood supply.

Forest area has continuously increased since 1990, and the rate of increase is fairly stable at the European level and within the regions that are analysed in this report.

Growing stock in European forests is above the world average and still increasing

The total growing stock of forests in Europe amounts to 35 billion m^3. The average density of growing stock in forests in the European region is 163 m^3/ha, which is larger than the world average (133 m^3/ha). Only the South American region, with 205 m^3/ha, has a higher density of growing stock (FRA 2010). In the last 25 years, the total growing stock in forests increased on average by 403 million m^3 every year, which corresponds to an annual increase rate of 1.4%. As the annual rate of forest area expansion was less than 0.4% in the same period, growing stock density in European forests increased from 126 m^3/ha in 1990 to 163 m^3/ha in 2015.

One third of European forests are uneven-aged

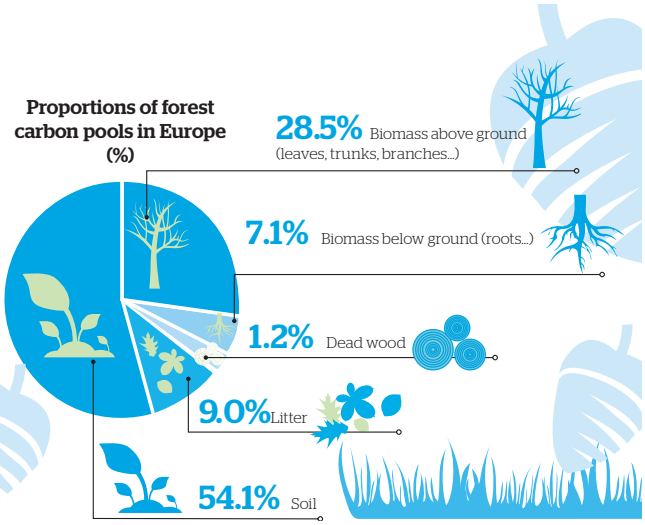
Forests in Europe are mainly even-aged and between 20 and 80 years old. 12% of forests are younger than 20 years old, 40% are between 20 and 80 years old and 18% are over 80 years old. Nearly a third of European forests are uneven-aged.

The forest area is expanding according to the defined targets in the countries with low forest cover

The main policy instrument for guiding and supporting the maintenance and expansion of forest area within the FOREST EUROPE region is forest law. The most reported policy objectives in relation to land use and forest area within the FOREST EUROPE countries are: afforestation of agricultural land unsuitable for agricultural use in countries where national laws do not prevent a change in land use; the management of erosion-sensitive mountainous areas improvements in the stability, productivity, diversity and naturalness of forests through an integrative forest management approach.

European forests are major carbon sink

European forests absorb large amounts of CO_2 from the atmosphere. Between 2005 and 2015 the average annual sequestration of carbon in forest biomass reached 719 million tonnes in the European region and 414 million tonnes in the EU-28. This corresponds to about 9% of the net greenhouse gas emissions for the European region and the EU-28. Carbon stocks in dead organic matter and soil organic carbon also seem to have increased, but these data remain unclear.



Carbon stocks and stock changes in forests as well as climate change mitigation and adaptation are the most frequently mentioned objectives

Policies on forest carbon and carbon balance have gradually shifted from a focus on sequestration capacity to a more integrated approach to sustainable forest management. The emphasis is on the full chain of sequestration, the production of wood and wood products, and especially on renewable bioenergy. As a result of climate change impacts, other important aspects are the adaptation of forests to these changes and the capacity of forests to mitigate climate change.

Most countries have established specialised entities responsible for implementing regulations, projects and programmes on climate change, renewable energy and energy efficiency. Subsidies accelerate measures designed to, above all, increase the use of wood biomass for bioenergy purposes.

Forest Ecosystem Health and Vitality

Depositions of air pollutants have continuously decreased since 1997, except for N-depositions, which have increased in Southern and Central-Eastern Europe

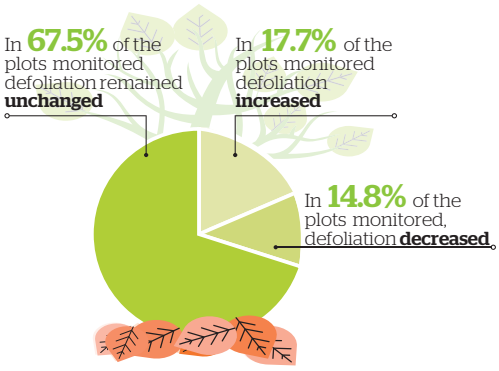
Depositions of nitrogen, sea-salt corrected sulphur, sea-salt corrected calcium, and sea-salt corrected magnesium currently vary across the different European regions. Nitrogen (both $N\text{-}NH_4$ and $N\text{-}NO_3$) predominates in Central-Western Europe and in some areas of Southern Europe. In Northern Europe, the deposition of nitrogen is generally lower than in other regions. Deposition of sea-salt corrected sulphur is equally high all across Europe, with the exception of Northern Europe, where the deposition is substantially smaller. The input of sea-salt corrected calcium and magnesium is generally higher in the Southern regions of Europe. Since 1997, nearly all elements have shown a decrease, which is larger in Central-Eastern Europe and smaller, but continuous, in Central-Western and Northern Europe. In recent years, nitrogen deposition on plots in Southern Europe has increased, but a slight increase in nitrogen deposition in the Central-Eastern European region has also been observed.

Data from forest areas correspond with previous assessments showing that soil organic carbon concentration levels have increased following a South-East to North-West trend in the EU

However, samples from the Mediterranean mountainous zone have a mean level that is comparable to more Northern and westerly parts of the EU. 15.4% of forest soil survey samples come from peat, mainly from Scandinavia. Given the significance of peat ecosystems, their carbon stock and carbon dynamics play a crucial role in the control mechanism of climate change, emphasising the huge importance of the northern peat forest areas.

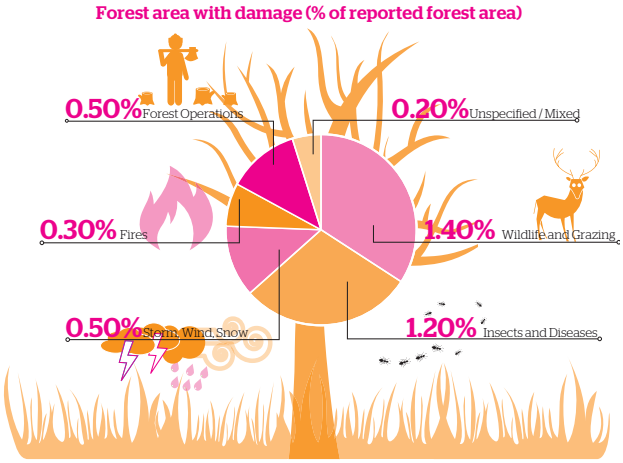
Defoliation remained unchanged on around two thirds of the plots monitored over the 10-year period

Crown defoliation is a key factor that indicates the health and vitality of a tree. Nearly one quarter of the trees surveyed in 2014 were classified as damaged or dead. However, tree crown condition remained unchanged on two thirds of the plots monitored over the 10 years within the period 2002 to 2014.



3.1% (or 3.7 million hectares) of Europe's forests are affected by forest damage, most frequently caused by biotic agents

Wildlife and grazing are the damaging agents that are most frequently observed in Europe's forests, affecting approximately 1.4% of the European forest area. Damage by wildlife and grazing are highest in Central-Eastern Europe and South-East Europe.



Insects and diseases are the second most frequent causal agent, affecting 9% of the forest area in South-West Europe and 3% in South-East Europe. Damage caused by forest fires, storms, wind and snow, and also by forest operations has been observed in well below 1% of the European forest area.

However, the amount of area affected by the different agents gives no indication of the severity of the damage and the associated economic losses.

Most countries reported specific objectives related to forest health and vitality (i.e. improved resistance, monitoring systems and climate change adaptation)

Nearly 30% of countries revised policy objectives by putting stronger emphasis on climate change or control of problems such as forest fires, pests and diseases, and invasive species. Most of the measures are aimed at monitoring forests pests and diseases.

Continuity in institutional, legal and financial instruments for maintaining and enhancing health and vitality of forests has been reported since 2011. A major improvement reported has been the new European Commission COM(2013) 267 Regulation on protective measures against plant pests.

Changes in informational means include improvements such as new mobile applications and web portals, as well as the use of social media to reach a wider audience.

Productive Functions of Forests

Increments in European forests substantially exceed fellings

Forests in Europe are growing at a high rate. In all European regions, net annual increment exceeds fellings. In Central-Western Europe, fellings were higher than in all other regions due to catastrophic events, mainly storms. Harvesting of wood has decreased in Europe since the previous reporting period.

Europe remains one of the largest producers of roundwood in the world

The overall value of marketed roundwood reached more than €18,000 million in 2010 and is still increasing. Europe's forests are still one of the main sources of roundwood in the world. The reported roundwood value by unit is highly variable among reporting countries. The demand for woodfuel is increasing at a high rate, especially in some Western European countries.

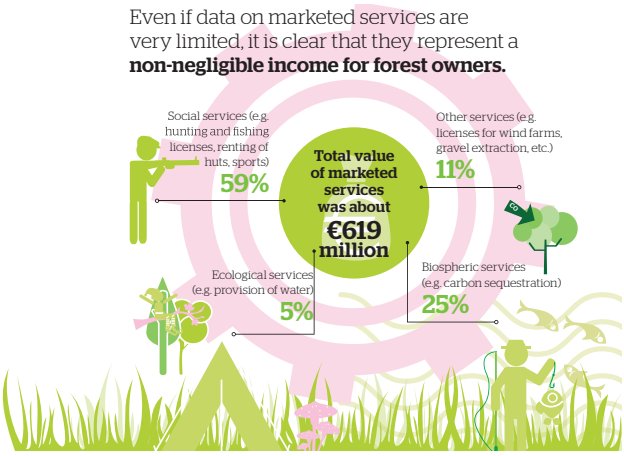
The total value of marketed non-wood goods reported was almost €2.3 billion

73% of the total value generated by non-wood goods comes from marketed plant products. The importance of various non-wood goods differs among countries. They can be an important source of income, especially at the local level.

The most relevant services reported are biospheric and social services.

The total reported value for marketed services is around €619 million

Biospheric and social services dominate in the reported data. Bearing in mind the relatively low number of responding countries, the total reported value for marketed services was around €619 million, which represents a further decrease in comparison with the €818 million reported in 2011 and the €941 million reported in 2007. Due to the incompleteness



of the data, it is not clear if this development relates to an actual fall in the marketed volumes of these services, or –what is perhaps more likely –the large variations in the monitoring and reporting of these values.

Most forests in Europe have a management plan

An area of over 155 million hectares is covered by forests under management plans or equivalents in the reporting countries, representing over 70% percent of Europe. There are substantial differences in the extent, form, content and importance of these tools across Europe. Since 1990, the proportion of forests covered by management plans or equivalents increased by 1% annually.

Few changes were reported concerning the objectives related to the production and use of wood, with most of such changes connected to the bioenergy sector. About 30% of the signatory countries reported developments in informational means

Two thirds of the reporting countries had targets for increasing production and use of wood in the context of SFM, and few of them (6 out of 34) reported new explicit targets for increased use of wood, notably in the bioenergy sector.

The implementation of the FLEGT action plan and the EU Timber regulation, and a greater emphasis on facilitating the incorporation of private forest owners into active management have been reported as the main drivers for institutional change.

While financial instruments related to wood production and use have generally remained stable, nearly a third of reporting signatory countries (10 out of 34) have reported changes in the informational means related to the production and use of wood (i.e. a register of forest owners or a central register for due diligence, among others).

While 25% of the reporting signatory countries reported changes in specific objectives, the majority showed continuity in relation to mechanisms and instruments

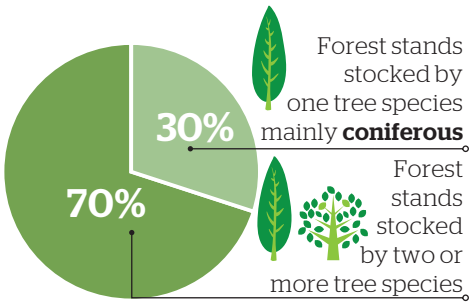
Although most countries reported no changes, nearly a quarter reported changes in policy regarding the production and use of non-wood goods and services (mostly in the sense of improving the quantification of the attention paid to them).

Forest law is the main legal instrument for regulating non-wood forest products, and the majority of countries have reported continuity in the use of existing legal/regulatory, financial and informal means in this specific field.

Biological Diversity in Forest Ecosystems

Mixed species stands dominate European forests

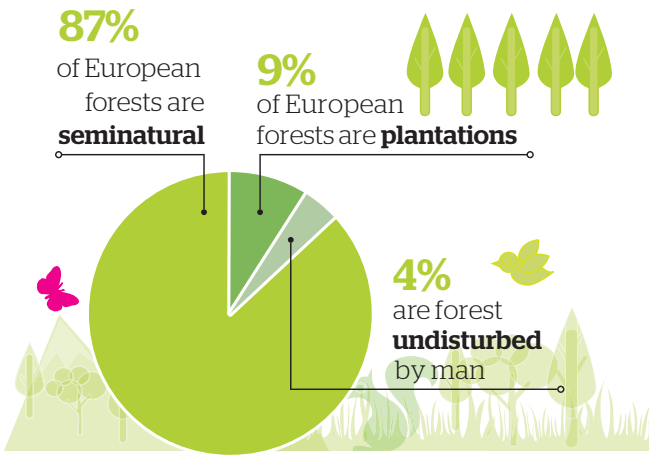
About 70% of the forests in Europe are dominated by two or several tree species, and the remaining 30% are dominated by one tree species alone, mainly coniferous. The area of forest that consists of a single tree species has continuously decreased during the last 15 years.



Regeneration approaches and natural expansion vary widely across Europe

Natural expansion predominates in South-East and South-West Europe, forests in Central Europe and in Northern Europe are mainly regenerated by planting, and natural regeneration is more frequent in Central-West Europe.

4% of European forests are undisturbed by man



About 87% of European forests are classified as semi-natural. Undisturbed forests cover 4% and plantations 9% of the forest area in Europe. Most undisturbed forests are found in Northern Europe and Central-East Europe.

Introduced tree species dominate 4.4% of European forests

Introduced tree species have a key role in timber production. Most of the area of introduced species is covered by *Pinus* spp. and *Picea* spp.

Tree species that are considered to be invasive occupy 0.5% of Europe's forests.

Deadwood is increasing slightly in European forests

The average volume of deadwood, both standing and lying, ranges between 8 m^3/ha in Northern Europe and 20m^3/ha in Central-West Europe. The amount of deadwood, particularly standing deadwood, has increased slightly in most of Europe's regions over the past 20 years. The amount of deadwood varies considerably between forest types, standing volume of the stands, decay rate, and vegetation zones, and is influenced by forest management regimes.

The areas managed for conservation of forest genetic resources and for seed production have increased over the last 25 years

There are significant gaps in the geographical representativeness of areas managed for *in situ* genetic conservation within the distribution range of European tree species.

Overall, the areas were managed for a total of 145 tree species, including subspecies and hybrids; however, three to five species alone account for half of the areas, and many other important tree species are neglected.

In 2015, more than half a million ha of forest in Europe were managed for genetic conservation and over a million ha for seed production. The number of species conserved and managed for seed production increased in most European countries.

Two thirds of European forests are in a core natural landscape pattern

In the period 2000-2012, this pattern tended to increase, suggesting local defragmentation processes (natural expansion of forests or newly planted forests). In most countries, however, the number of landscapes with highly connected forests either remained stable or decreased, suggesting that distance and landscape permeability in between forest areas are not adequately accounted for in management and planning. 35% of European forests are significantly fragmented by agriculture and artificial lands. Landscapes with poorly connected woodlands represent more than 60% of EU territory.

Forests are an important habitat for threatened species

Threatened forest species include birds, mammals, and other vertebrates and invertebrates as well as trees and other plant species. Most of the forest tree species in Europe are not threatened. However, information on other threatened species is still fragmented and heterogeneous.

More than 30 million ha of European forests are protected

More than 30 million ha of European forests are protected with the main objective to conserve biodiversity or landscape. Over the last 15 years, the area of protected forests has increased by half a million hectares annually. Approaches to forest protection vary considerably within Europe.

A large majority of countries (more than 90%) have specific objectives in relation to biodiversity. Almost half have reported legislative developments and just small changes in other instruments

Biodiversity remains an important topic for forest policy and management in Europe. Compared to the previous reporting period, biodiversity-related forest policy objectives have been maintained. Regulatory instruments continue to play an essential role in the conservation of biodiversity in forests and have been reinforced by new financial and informational measures. The EU's biodiversity policy is a major trigger for change relating to informational, financial and legislative instruments at the national level.

Protective Functions in Forest Management

Forest fulfill all protective functions

More than 25 million ha of forests in Europe are designated for the protection of water supplies, the prevention of soil erosion and the provision of other important ecosystem services.

Forests protect infrastructures and managed natural resources from natural hazards

Around 30 million ha of forests in Europe are designated for the protection for infrastructures and managed natural resources. Often the protective role of forests covers a wide range of aspects, including infrastructures and managed natural resources, but also other services such as water, soil and ecosystem protection. Most protective forests are in the Central-East European region. They are also highly relevant in countries with steep terrain (e.g. Switzerland or Italy).

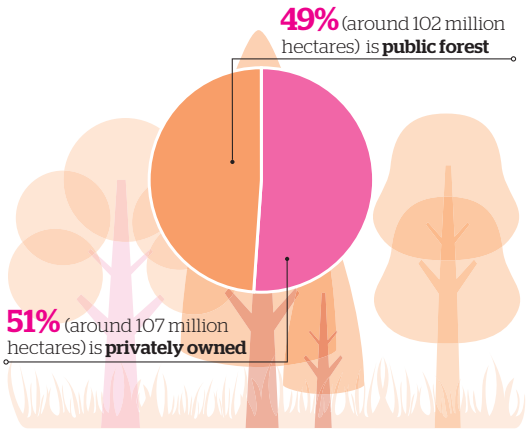
Long term commitment on protection of water and soil in Europe

The main policy objectives related to the protective functions of forests, namely the protection of soils, water resources and biodiversity have remained unchanged since 2007. This shows a long-term commitment to maintain and enhance the protective functions of forests. Most reporting countries identified soil protection as a main policy objective, with particular attention given to mitigating and preventing soil erosion, and about one third of countries identified protection of water resources as a priority. Institutional and regulatory frameworks as well as financial instruments and informational means provide a solid basis for the implementation of related policies.

Socio-Economic Functions and Conditions

The number of private forest holdings is increasing

Privately-owned forest area has slowly but steadily increased. The number of publically-owned forest holdings has been relatively constant or decreasing. While the number of private forest holdings is much higher than public holdings, the majority of private holdings are forests of less than 10 ha in size.



The forest sector contributed around 0.8% to GDP (Gross Domestic Product) in the region as a whole

In 2010, total gross value added by the forest sector in Europe amounted to €103 billion (0.8% of GDP). This figure is lower than the value reported in 2000 (1.2% of GDP). The forest sector was affected by the recent global economic recession in 2008-2009 and has been on a slow path of recovery ever since.

7 out of the top 10 countries with the highest value added in the forest sector are in Central-West Europe and South-West Europe, and the sector is relatively more important to local economies (i.e. higher percentage of GDP) in Northern Europe and Central-East Europe. The value added in the pulp and paper industry in Europe continued the general downward trend, although the rate of decline is lower than in the past.

Most parts of the regions in Europe saw an annual increase in net value added

During the period, the increment in net value added per ha varied considerably between regions (from 0.1 to 5.3%). Entrepreneurial income showed a pattern similar to net value added.

In the last year of reference, 475 million m^3 of roundwood equivalent was produced in Europe.

Expenditures for services remain constant, while revenues from services are increasing

Governments in Europe currently spend more than €3 billion on forest services, with an average of €37 per ha. Expenditures were stable during the period 2000-2010. However, there is considerable variability across individual regions. Government revenue from forest products and services reached at least €1.8 billion in 2010, with an average of €40 per ha. Revenue steadily increased during the decade 2000-2010 in all regions of Europe.

Forest sector still plays an important role in relation to employment

In most European countries, the number of people employed in the forest sector has decreased. There is a huge diversity of qualifications, with pronounced differences between regions. Despite that, the forest sector in Europe provided jobs and income for at least 3 million people, plus an unaccounted number of people in informal employment, which is not reflected in the reported data. Therefore, the forest sector plays an enormous role in the livelihood of rural areas. The forest sector is still a "male domain".

Forest work remains a dangerous occupation

Despite the fact that fatal and non-fatal occupational accidents decreased considerably in the last 25 years, forestry work remains a dangerous occupation. Occupational accidents are highest in countries that are characterized by difficult topography.

During the 2008-2009 financial crisis, wood consumption decreased in Europe

Wood consumption varies considerably among different regions of Europe and mainly depends on forest resource endowment and cultural differences in the use of wood. After a steady growth in wood consumption between 1990 and 2005 in most regions, there was a considerable slowdown in consumption between 2005 and 2010, during the financial crisis.

Europe has shifted from a net importer to a net exporter of primary wood and paper products

Trade in roundwood and all of its products, both within Europe and with its trading partners, was on the rise until the 2008-2009 global financial crisis. Exports doubled in volume between 1990 and 2005, and imports increased by 60%. With many European countries in recession during that period, trade volume decreased, whereas the value of trade remained steady from 2005 (when adjusted for fluctuations in currency exchange rates). This shift was ongoing until 2005, mainly because of contracting consumption and imports. Government policies supporting renewable wood energy resulted in a boom in the trade of chips and pellets.

Energy from wood resources contributes significantly to renewable energy targets

Northern Europe has the highest per capita consumption of wood-based energy, reflecting the (general) abundance of forest resources and prominence of wood-based industries in this region. Annual wood consumption per capita increased in both Northern and Central-Western Europe between 2009 and 2011, partly reflecting the drive to live up to renewable energy targets.

Most forests in Europe are accessible for recreation

75% of countries report that in 2010, at least 90% of their forests and other wooded land provided access to the public for recreational purposes. Two thirds of countries report that less than 6% of their forests and other wooded land has recreational use as a main management goal.

More than 1.25 million cultural sites are located in European forests

Around 1.25 million sites with cultural and spiritual values have been recorded within forests and other wooded land across Europe, of which around three-quarters were classed as 'Cultural Heritage'. Around three-quarters of the total number were recorded in Sweden.

Most reporting signatories have specific policy objectives in relation to the economic viability of forests

The majority (27 out of 34) reported specific policy objectives in relation to the economic viability of forests, and only few countries reported changes in policy objectives related to the economic viability of forests.

Most countries did not reported any changes to legal incentives, economic/financial incentives, or informational and communication means. Few signatories (7 out of 34) reported changes to institutional frameworks. Although most of the reported changes were part of overall institutional reforms, 3 countries reported specific developments related to institutional arrangements, such as the creation of specific departments or sections.

The majority of reporting signatories have specific objectives related to employment

The majority of reporting signatories (25 out of 34) have specific objectives related to employment (generally oriented towards the maintenance or increase of forest employment, the improvement of working conditions,and skills and qualifications, among other things). For most countries (30 out of 34), these objectives are a continuation of the objectives reported in 2011.

More countries are promoting participation, with a wide variety of means being used, as was also stated in 2011

A total of 25 out of 34 signatory countries reported specific policy objectives in relation to public participation and awareness. Compared to 2011, more countries are currently aiming to promote participation in forest planning and decision-making processes. For nearly a third of the reporting countries, the main objective is to enhance public awareness of forest protection and conservation and increase understanding of the multifunctional role of forests.

Enhancing research activities, cross-sectoral cooperation, innovation and technological development, as well as improving the quality and efficiency of forest education and training at all levels is becoming more important

Most signatories (26 out of 34) reported specific objectives in relation to research, training and education, and about 25% reported developments in these specific objectives since 2011. With regard to education and training, the situation remains similar to the previous reporting period.

Increased interest has been shown through more countries reporting and a significant proportion (60%) of positive developments in cultural and spiritual values

The number of countries that provided data on this matter increased from 29 to 31 during the last four years, of which 60% reported positive changes.

Concerning key measures adopted, nearly 30% of countries reported on diverse measures in relation to cultural and spiritual values.

Most signatory countries did not report any changes to overall financial instruments and economic policy contributing to cultural and spiritual values. Concerning information instruments, only a few (5 out of 31) countries reported positive developments in relation to cultural and spiritual values (e.g. nature parks and information centres for visitors, new publications, etc.) or more cultural events and programmes with forest schools.

Introduction

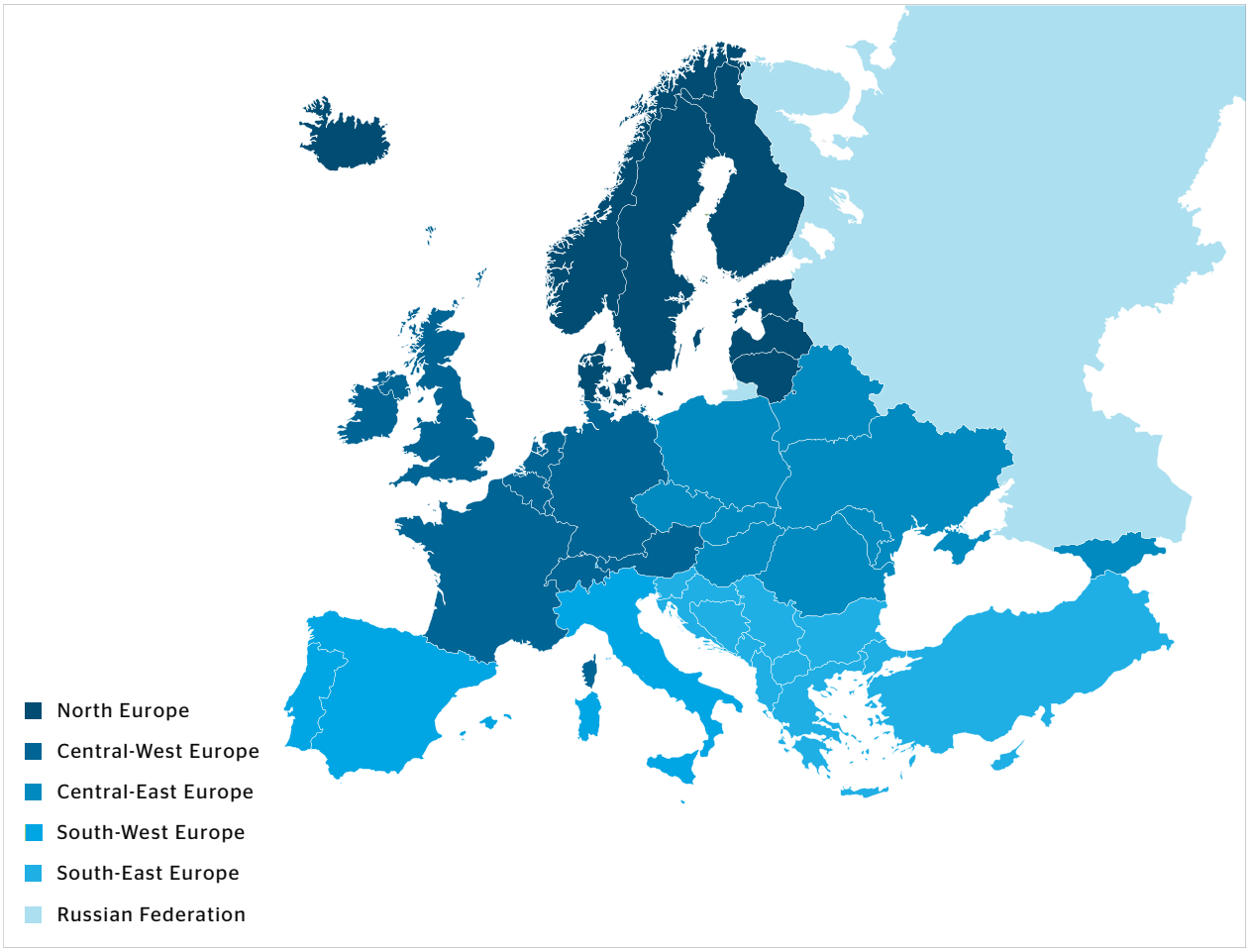


Figure A: Forest Europe Country Groups

The Ministerial Conference for the Protection of Forests in Europe, known as FOREST EUROPE, has been presenting the "State of Europe's Forests Report" to Ministerial Conferences since 2003. This 4th edition of the report is presented to the 7th Ministerial Conference.

FOREST EUROPE is a European high-level policy process for dialogue and cooperation on forest policies. The process focuses on the need to assess the state of forests and the progress made towards Sustainable Forest Management (SFM) at regional level. One of the main achievements of the FOREST EUROPE process is the development of a pan-European set of Criteria and Indicators.

The pan-European set of Criteria and Indicators, which was developed as a policy instrument for monitoring, evaluating and reporting the progress made in implementing sustainable forest management, is one of the main tools available for monitoring sustainable forest management at national and regional levels.

The report "State of Europe's Forests 2015" aims to provide policy makers and stakeholders with comprehensive up-to-date information on the status and trends in forest and sustainable forest management and to provide a solid basis for future political commitments on forests and other forest-related issues.

The "State of Europe's Forests 2015" report has been coordinated and compiled by FOREST EUROPE's Liaison Unit Madrid in collaboration with the Food and Agriculture Organization of the United Nations (FAO), the European Forest Institute (EFI), the European Commission Joint Research Centre in Ispra and the University of Hamburg (UHH).

The FOREST EUROPE countries decided at the Expert Level Meeting held in February 2012 in Madrid that the current edition of the State of Europe's Forests would be based on the experience gained from previous reports, in particular the 2011 report. Accordingly, and in order to highlight regional differences, the countries were grouped in six country groups.

The report covers the 46 FOREST EUROPE signatory countries and the European Union. The information used in the compilation of the report was supplied by the governments and by several international data providers, namely the International Co-operative Programme on Assessment and Monitoring of Air Pollution effects on Forests (ICP-Forests), the European Commission Joint Research Centre, Bioversity International, EUROSTAT (the Statistical Office of the European Union), FAO, and the UNECE Joint Forest Sector Questionnaire and Joint Wood Energy Enquiry.

For the first time, the 2015 edition of the "State of Europe's Forests" was produced simultaneous to the Global Forest Resources Assessment (FRA 2015). As agreed during the Expert Level Meeting held in February 2012 in Madrid, the possibility of joint data collection with FAO's FRA 2015 was explored with a view to enhancing the quality and harmonization of data collection and reporting. The result of this process was the Collaborative Forest Resources Questionnaire (CFRQ), which was led by FAO and established through six international regional processes. The CFRQ is included in the "Forest Data Reporting Package for 2015", which is distributed by FAO. The information relating to seven FOREST EUROPE Quantitative Indicators was collected through this CFRQ.

The information on the pan-European Quantitative Indicators was collected using the Joint FOREST EUROPE/UNECE/FAO Questionnaire on Pan-European Quantitative Indicators for Sustainable Forest Management. Information relating to 21 Quantitative Indicators was collected using this questionnaire, which has been improved with a view to facilitating the work of the National Correspondents. This process was led by the UNECE/FAO Forestry and Timber Section. The data on the remaining 7 Quantitative Indicators were obtained directly from the international data providers.

The UNECE/FAO Forestry and Timber Section provided the Liaison Unit Madrid with technical support through the collection, processing and reviewing of the data from Quantitative Indicators used in the compilation of this report.

The information on pan-European Qualitative Indicators was collected using the "Questionnaire on pan-European Qualitative Indicators for Sustainable Forest Management". The Liaison Unit Madrid developed and improved the questionnaire in close collaboration with FAO and the EFI in accordance with the recommendations and suggestions made by the Advisory Group on the elaboration of the "State of Europe's Forests" report and based on the lessons learnt from previous experience.

The "State of Europe's Forests 2015" report is divided into two parts. The first part (Overall Policies, Institutions and Instruments for Sustainable Forest Management) provides general information about the way in which forests are governed in the countries through policies, institutions and instruments for SFM. These aspects are covered by 5 Qualitative Indicators and the changes reported on these indicators over time reveal how policymakers are responding to the challenges and opportunities associated with forests and SFM. The second part of the report (European Forests: Status, Trends and Policy responses) was compiled in accordance with the Advisory Group's recommendations and provides the information relating to the 35 Quantitative Indicators, which provide information on the current status and changes in European forests and the progress achieved in SFM, and to the 12 Qualitative Indicators which provide information about the policies, institutions and instruments used to address specific Policy Areas corresponding to the Quantitative Indicators for SFM. This part of the report is structured according to the 6 Criteria for SFM and includes the Quantitative Indicators and the Qualitative Indicators that relate directly to them.

The Output Tables included in the Annexes present the information reported on Quantitative Indicators by 35 signatory countries, the information included in the 11 desk studies compiled by the UNECE/FAO Forestry and Timber Section (Albania, Andorra, Greece, Holy See, Liechtenstein, Luxembourg, Malta, Monaco, Republic of Moldova, Serbia, The Former Yugoslav Republic of Macedonia), and the information reported by the Russian Federation for the previous edition of the "State of Europe's Forests" report (2011). In view of the lack of comparable current data from the Russian Federation, to maintain the internal consistency of the report, the Russian information from 2011 is not included in the analysis and graphs, however it is included in the Output Tables.

Part I
Overall Policies, Institutions and Instruments for Sustainable Forest Management

Coordinating lead authors: **Ewald Rametsteiner**

Chapter reviewer: **Gerhard Weiss**

Overview

Introduction

The chapter on "Overall Policies, Institutions and Instruments for Sustainable Forest Management" provides general information about the way forests are governed in a country based on policies, institutions and instruments for SFM. These are covered by 5 Qualitative Indicators (Part A of Forest Europe's Qualitative Indicators). Over time, the changes reported on these Indicators demonstrate the responses of policy makers to challenges and opportunities relating to forests and SFM.

A total of 33 countries and the European Commission reported on the Indicators relating to overall policies. Together these account for 92% of total forest and other wooded land in the FOREST EUROPE region. As response rates varied for individual Indicators due to differences in data availability in the countries, the number of responses is usually specified for the respective Indicators. The boxes containing examples from countries are taken from country reports.

Overall Policies, Institutions and Instruments for Sustainable Forest Management

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Data resources: Indicators A1, A2, A3, A4 & A5 – National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator A1 National forest programmes (NFP) or similar and related forest policies

32 out of 33 countries from the FOREST EUROPE region reported that they had a NFP process in their country in 2014. The number of countries with a "formal NFP process" has almost tripled since 2007. Significant changes in NFP processes since 2011 mainly involve amendments or updates intended to address the economic crisis or issues relating to implementation. While it is widely acknowledged that NFPs encouraged broad participation, which facilitates the adoption and implementation of policies and strategies, NFPs have been less successful in terms of inter-sectoral co-ordination and the integration of forest aspects into broader development goals. This remains an issue therefore.

A forest policy document, for example a "forest strategy", "forest policy" etc. (apart from legislation) exists in practically all FOREST EUROPE countries. Around half of these were developed in the context of NFP processes and/or are endorsed at a high political level.

Indicator A2 Institutional frameworks

Since 2011, significant changes relating to institutional frameworks were implemented by 14 of the 34 respondents. Forestry administration units continue to be merged with bodies responsible for natural resources, rural development and nature conservation. In a majority of countries, the management of public forests is the responsibility of a separate body, mainly (a) publicly-owned state forest enterprise(s). The number of forest-related public employees reported in 2014 is around 14% lower than that reported in 2010. Around 220,000 persons work in forest-related public organizations in Europe, mostly in the management of public forests. High numbers of public forests management staff are employed in countries with large areas of public forests and in which citizens expect extensive social services from forests.

Indicator A3 Legal/regulatory frameworks and international commitments

The forest laws currently in force in most FOREST EUROPE countries are less than five years old. Nearly half of the reporting signatories (15 out of 34) have amended their legal and regulatory frameworks since 2011. The most frequent amendments in the legal/regulatory frameworks address issues concerning the governance of land use change. With regard to international commitments, the majority of the signatories (20 out of 34) reported domestic policy and legal changes in the follow-up to international commitments such as the EU's Timber Regulation and FOREST EUROPE's Oslo Ministerial Decision and Resolutions.

Indicator A4 Financial instruments and economic policy

The majority of reporting signatories in the FOREST EUROPE region (23 out of 34) reported no changes in the national economic policy on forests (public and private) since 2011. In nearly half of the reporting FOREST EUROPE signatories (16 out of 34), the management of state-owned forests is financially self-sufficient or profit-oriented. As reported by 23 countries, total public expenditure by government on all forest related activities for the last reporting period was EUR 3,234,750,019. This total sum amounts to an average of around EUR 17.9 per hectare of total public expenditure on forest and other wooded land per year. Subsidies are the most common financial instrument used to influence private forest management (used by 22 out of 34 signatories). Transfer payments are most frequently used for the conservation of forest biodiversity, followed by support for forest inventory and planning, and soil and water protection.

Indicator A5 Informational means

Most reporting signatories (31 out of 34) provided public access to forest inventory data. Over one third of countries had a formal (governmental) forest-related outreach and communication strategy. Social media are used by an increasing number of countries to strengthen forest communication.

Indicator A1 National forest programmes (NFP) or similar and related forest policies

Introduction

National forest programmes are a key process used by countries to govern forests and their sustainable management. They are understood as comprehensive policy frameworks aimed at further improving sustainable forest management and the contribution to sustainable development. They are based on the principle of a participatory, holistic, inter-sectoral and iterative process for policy planning, implementation, monitoring and evaluation at national and/or sub-national level. These principles are presented in the "MCPFE Approach to National Forest Programmes in Europe" (Annex 1 of Vienna Resolution 1 on NFPs, adopted in 2003). Similarly, the UN "Non-legally Binding Instrument on All Types of Forests", adopted in 2007, identifies the NFP as a key mean for implementation.

Status

32 countries report that they have a NFP process in their country

NFPs or similar processes exist in 32 out of 33 reporting countries, which means that 92.2% of the entire FOREST EUROPE area is governed by NFPs. Over half (18) of all reporting countries state that their NFP process is a "formal NFP process", i.e. the process is explicitly acknowledged and referred to as such. Almost a quarter (5) state that their process is "explicitly guided by NFP principles". Policy processes similar to NFPs are mainly reported by countries with federal structures like Germany, Italy, Spain and United Kingdom.

In over two thirds (22) of the countries the ministry responsible for forests is the main formal decision-making body within the NFP process. Only 6 countries reported that the main formal decision-making authority in the NFP process lies with bodies whose members are not from the ministry responsible for forests. These formal bodies are at a high political level in some countries, e.g. the parliament in Latvia and Council of Ministers in Spain.

A forest policy document exists in practically all FOREST EUROPE countries. Around half of them were developed in the context of NFP processes and/or are endorsed at high political levels

All 33 reporting countries and the European Commission stated that they have a forest policy document (apart from legislation) and almost all of these documents are accessible online, i.e. accessible to the public. 13 countries reported that their main forest policy document is entitled "policy" or "strategy", while 10 countries reported that their main forest policy document is a "national forest programme". Around half (18) of countries reported that the main forest policy document was developed in the context of a formal NFP process or a process explicitly guided by NFP principles, while 14 countries and the European Commission reported that they did not use NFP processes or their principles explicitly.

The highest level of endorsement or enactment of a country's main forest policy document is frequently the Council of Ministers (in 13 countries) or minister responsible for forests (in 9 countries, see Table 1). With some exceptions, endorsement is secured at higher political levels in Northern and Eastern European countries. 7 countries, most of which are states with a federal structure, report the existence of formally endorsed sub-national forest policy documents (Belgium, Germany, Italy, Norway, Spain, Switzerland, United Kingdom).

Table 1. Highest endorsing body of main forest policy document in FOREST EUROPE signatories

Endorsed by	Country
Parliament	Estonia, Norway, Portugal, Slovenia, Sweden
Council of Ministers	Bulgaria, Cyprus, Czech Republic, Finland, Hungary, Latvia, Montenegro, Poland, Portugal, Romania, Spain, Switzerland, Ukraine, Serbia
Minister responsible for forests	Croatia, France, Germany, Spain, Turkey, Slovenia, United Kingdom, Denmark, Ireland
Forest department or similar	Albania, Iceland, Luxembourg
Other	Austria, Italy, European Commission

The average main forest policy document currently in use in the countries was endorsed or enacted around 7 years ago. The main forest policy document is older than 10 years in only 6 countries (Denmark, Germany, Ireland, Latvia, Norway, Slovenia), while a number of Eastern European countries have recently endorsed new policies (see Figure 1).

Around half of the main forest policy documents provide for the periodic and pre-specified evaluation of policy implementation, while periodical evaluation is provided for but not pre-specified in the forest policy documents of around 11 countries.

Some 70% or 24 reporting countries state that there is explicit reference to the FOREST EUROPE definition of SFM in the main forest policy documents, and two thirds of the reporting countries state that the main forest policy document makes explicit reference to the FOREST EUROPE Criteria and Indicators for Sustainable Forest Management. Around one third of countries make explicit reference to the FOREST EUROPE guidelines on national forest programmes.

Trends and explanations

Additional countries have established a formal NFP process in accordance with the agreed NFP principles of good governance

Of the currently active NFPs, 10 initiated or took renewed action after 2011, compared to 4 in the 2008-2011 period and 6 in the 2004-2007 period. Compared to 2007, when a total of 7 signatories reported that they had a "formal NFP process", substantially more countries (18) reported that they had a "formal NFP process" in place in 2014. A few countries, including countries with large forest areas, such as Sweden and Poland, have established formal NFP processes explicitly guided by the Forest Europe NFP principles since 2011. This increases the area covered by formal NFPs by some 26% of the Forest Europe FOWL area or 15% of the population of FOREST EUROPE signatory countries.

Around one third of signatories (13 out of 34) reported **significant changes in NFP processes since 2011**. The most frequent change reported concerns amendments or updates to strategies or existing NFPs, in particular to address the economic crisis (5 countries) or issues regarding policy implementation (3 countries). 7 countries reported that the NFP process was used to develop a new strategy or national forest programme since 2011. 3 countries reported on changes implemented with a view to strengthening participation, and 2 countries reported on evaluation as a significant change in the process.

Finland

The Finnish forest sector is undergoing enormous changes due to a decline in the demand for graphic paper and a growing trend for a green economy. In order to find new opportunities for the forestry sector, the Ministry of Agriculture and Forestry conducted a participatory process with stakeholders as part of the preparation of the Government Report on Forest Policy 2050. The extensive participation of stakeholders proved fruitful in terms of establishing a holistic approach, identifying new ideas and prioritizing objectives. The government report reduced the number of development projects and created clear priorities for national forest policy with more efficient projects. The aim of the report was to find ways of increasing the forestry sector's contribution to prosperity and growth together with the multi-functional use of forests. The Forest Policy Report 2050 is the basis for the revised Finnish national forest programme (National Forest Strategy 2025) and its implementation also covers other governmental sectors. The Government adopted Finland's new National Forest Strategy in February 2015.

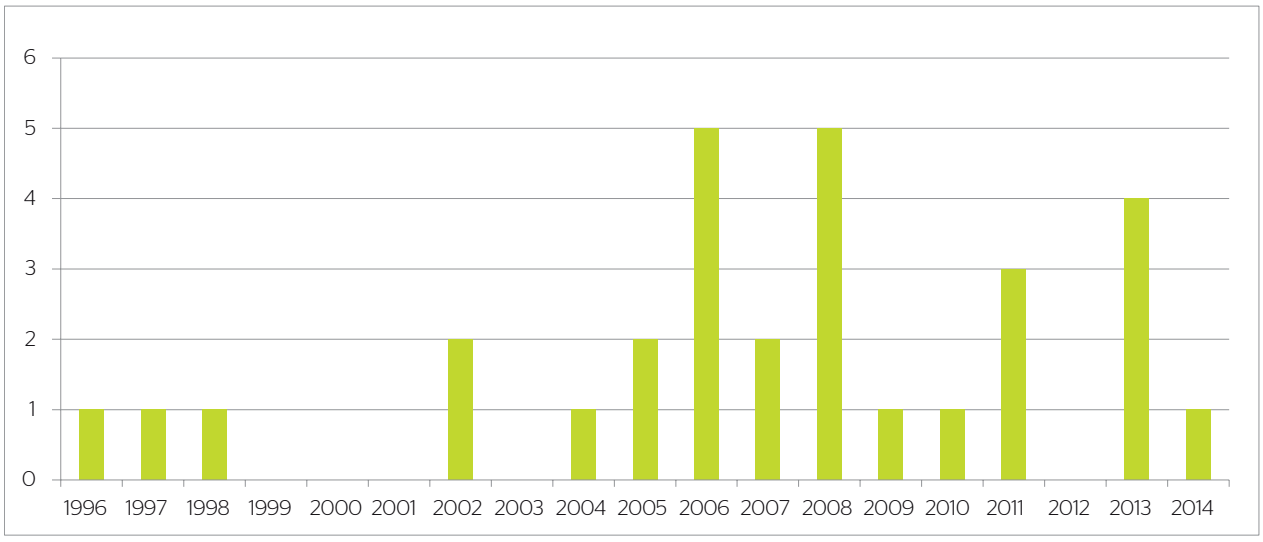

Figure 1. Date of endorsement of main forest policy document (number of countries)

Denmark

It was decided to initiate a process for a new National Forest Programme with stakeholder participation in 2012/2013. Findings from an ad-hoc advisory board on Forest Policy Development provided the basis and inspiration for the revision of the Danish NFP. In the first half of 2014, three thematic workshops started work on the drafting of the NFP, which continued during 2014. It is planned to submit a draft of the new National Forest Programme for public consultation in early 2015 with a view to its final adoption in 2015.

Slovak Republic

The fulfilment of the measures planned in the Action Plan to the National Forest Programme for the period 2009-2013 was evaluated in June 2014. Based on this evaluation and new documents relating to forest policy at national and international levels, the framework objectives of the Action Plan for the period 2014-2020 are now being updated. In 2013, the government adopted the Wood Potential Utilization National Programme, a document closely related to sustainable forestry, particularly in relation to wood production, economic viability and employment.

Sweden

The existing forest policy was finally adopted by the Government following intensive stakeholder consultations. However, the Swedish Government formally decided to establish a National Forest Programme process in June 2014. The details have not yet been decided on, however the NFP process will provide a basis for the Government's decision-making in relation to forests. The NFP will be an interactive process and will be evaluated after five years. However, with respect to possible legislative changes in the Forestry Act, for example, the normal parliamentary process will apply, irrespective of the origin of the initial proposals.

Broad participation facilitates the adoption and implementation of policies and strategies

With regard to key lessons learnt, signatories list a range of points that underscore the added value of NFP processes. The main message, highlighted by seven countries, is that broad stakeholder participation is key to facilitating the adoption and implementation of policies and strategies. A range of countries also point out that NFP processes enable dialogue and promote consensus and collaboration. They enable the development of shared values and goals, which strengthen the forest sector and facilitate public and private investment. NFP processes also help with the more consistent balancing of the economic, environmental and social dimensions of forestry, the integration of international commitments, and in arriving at shared views on priority actions. Several countries stressed that NFP processes allow increasing information and transparency and the sharing of knowledge.

Austria

The Austrian Forest Dialogue is a broad participatory process for forest policy formulation and implementation based on the principles for NFPs as defined in Vienna Resolution 1. It is important for strengthening the sector, balancing conflicting interests, raising awareness about forests and forestry, maintaining leadership in forest matters, gaining support for forest measures, creating new partnerships and cooperation, and fulfilling international commitments.

Poland

The first National Forest Programme (NFP) process was introduced in 2001. The development of the NFP was a top-down process and was not concluded due to weak stakeholder involvement. The National Forest Programme process was initiated again in late 2012 and work on it is still in progress. The NFP aims to create a vision for Polish forestry. The general idea is to establish a long-term strategic programme for the development of sustainable forest management, which will function as an integrated programme for the entire forestry and timber sector and a tool for nature conservation in forests. The NFP's objective is to involve all stakeholders in the process of forest policy through the optimum application of different points of view.

Estonia

Public access to state-of-the-art information and knowledge about forests and the forest sector is a factor for success. The broad participation of the stakeholders involved facilitates the adoption of the policy document.

NFPs promote results-based governance

Compared to 2011, more countries reported on steps for the further institutionalisation of NFPs as national forest governance frameworks by integrating specifications related to NFPs into national legal frameworks or by promoting sub-national NFPs (especially in federal states like Germany and Spain). Moreover, several countries report the use of NFP processes to agree on common goals, set more concrete objectives and – accordingly - targets, and put mechanisms in place for reporting on subsequent implementation.

Hungary

The Ministry responsible for forestry prepares the annual plan of implementation of the National Forest Programme (NFP) in consultation with other forest-related ministries and stakeholders. Regular reports summarise the status of annual implementation and main achievements of the NFP. The NFP defines strategic goals and policy objectives; however it does not generally link these objectives to quantified targets. Quantified targets are often subject to annual implementation.

France

Specialised local commissions are in charge of follow-up on the consumption of agricultural space. Their mandate has been extended to the consumption of forest space (Forest Act, October 2014). The current NFP is valid until 2015 and will be reviewed in 2015. A new Law on Forest (October 2014) provides a legal basis for the next NFP, which will become the national framework programme for sub-national forest programmes. To enable inter-sectoral coordination, this will be agreed on by all of the ministries concerned. Objectives and targets will be added and the EU Forest Strategy will be taken into account.

The two main challenges are getting and keeping all key stakeholders involved and obtaining sufficient financial and human capacities for NFP processes

One of the lessons learnt is that NFP processes need to be adapted to national contexts and realities. In this way, these participatory processes can create a sense of ownership and demonstrate the added-value in promoting sustainability to key stakeholders. Adequate financial and human capacities are needed to implement a participatory NFP process. This proved to be a challenge in a range of countries and was aggravated by the economic crisis of recent years. In some countries where such processes are already in place, maintaining support and momentum is a challenge that needs to be addressed through the evaluation of experience and results and adaptation to policy and economic framework conditions.

Inter-sectoral co-ordination and the integration of forest factors into broader development goals remain a challenge

Countries appear to have scaled back on the initial ambition of NFPs regarding the promotion and achievement of inter-sectoral co-ordination or integration as very few reported on inter-sectoral coordination and collaboration as constituting important objectives and achievements. The experience gained so far in many countries has revealed that other sectors show limited interest in the NFP process as such, and that it takes time to experiment and learn how to best engage in dialogue with other sectors in areas of shared topical interest. Given that the principle of inter-sectoral coordination of NFPs remains of crucial importance for the sustainable governance of forests, the sharing of experience and, subsequently, adaptation of NFP processes appears crucial to addressing key future challenges and opportunities regarding the sustainable provision of multiple benefits to society by forests.

Main forest policy documents are usually around 7 years old

A majority of signatories (18 out of 34) reported changes in relation to their main forest policy documents. 5 countries have developed and endorsed or enacted a new main policy document since 2011. In a number of countries, evaluations of existing policies were concluded (e.g. Ireland, Slovak Republic) or are under way, or new policies or strategies are currently being developed (e.g. Denmark, Sweden). Several countries reported on amendments to national forest laws (e.g. Bulgaria, Italy, Spain) or on institutional reforms for streamlining implementation (e.g. Turkey). A number of countries reported that the revised policy or strategy sets new objectives, which address, in particular, climate change, greater competitiveness and job creation, and adaptation to international requirements, particularly the European Union's regulations and directives concerning forests.

Compared to 2011, more countries report that the main forest policy document is endorsed or enacted at high political level, i.e. the Council of Ministers or Parliament.

EU Forest Strategy

"EU Forest Strategy - European Commission Communication COM(2013)659, "A new EU Forest Strategy: for forests and the forest-based sector." The Strategy is based on the principle of subsidiarity. It aims at establishing a framework for forest-related actions in support of sustainable forest management, based on the coordination of the forest policies of the Member States and EU policies and initiatives relevant to forests and forestry. The Strategy provides a holistic approach to forests and forestry addressing the economic, social and environmental dimensions of sustainable forest management. It also takes an integrated approach covering forestry and the forest-based value chains, considering the important contribution that the forest-based sector can make to growth and jobs in the EU, in particular in rural areas.

This document provides strategic orientations related to eight interlinked priority areas, plus the 2020 target "To ensure and demonstrate that all forests in the EU are managed according to sustainable forest management principles".

Spain

A new programme called the National Programme for the Socioeconomic Activation of the Forest Sector (PASSFOR) was passed in January 2014. It aims to promote green jobs and generate economic added- value in the forest sector.

Indicator A2. Institutional frameworks

Introduction

The "institutional framework" refers to the organisational and administrative structure of forest policy and its implementation in a country. It determines the responsibilities and competencies of different public and private bodies at various levels. Institutional frameworks provide the structure for national, regional and local politics, for developing forest-related public policies and their implementation. The prevailing institutional framework shows how countries organise the protection and sustainable use of forests. Changes in these frameworks are indicative of changes in political goals and culture.

Status

The management of public forests is the responsibility of a separate body in most countries

The administration of the development and implementation of forest policy forms part of the responsibilities of a ministry at national level in all reporting countries with the exception of Belgium and Germany, where this function is carried out at sub-national level. In Sweden and Ukraine separate governmental bodies are in charge of forest policy development and implementation (the Swedish Forest Agency and Ukraine's State Forest Resources Agency). In a range of countries this function is performed by ministries together with sub-national ministries or bodies (e.g., Czech Republic, Germany, Italy, Spain, Switzerland). Similarly, law enforcement and supervision are part of a ministry's responsibilities and concentrated at central government level in 23 countries, while in 7 countries (Croatia, Finland, Iceland, Montenegro, Norway, Sweden, Ukraine) these functions are the sole responsibility of a separate governmental body (see Figure 2).

Support for private forest management is provided by separate bodies in 10 countries, e.g. through organisations of private forest owners or Forest Centres (Finland). In 19 countries, the provision of such support is part of the responsibilities of the ministry at national level; in 5 countries, the latter is supported by bodies at sub-national level.

The management of public forests is in the hands of separate organisations, such as publicly owned forest enterprises, in 16 out of 34 reporting countries. These include state/federal forest enterprises/companies (e.g. Austria, Bulgaria, Finland, Latvia, Serbia, Slovak Republic) and a National Forest Holding (Poland); in some cases public forests management is divided between several public organisations (Czech Republic)

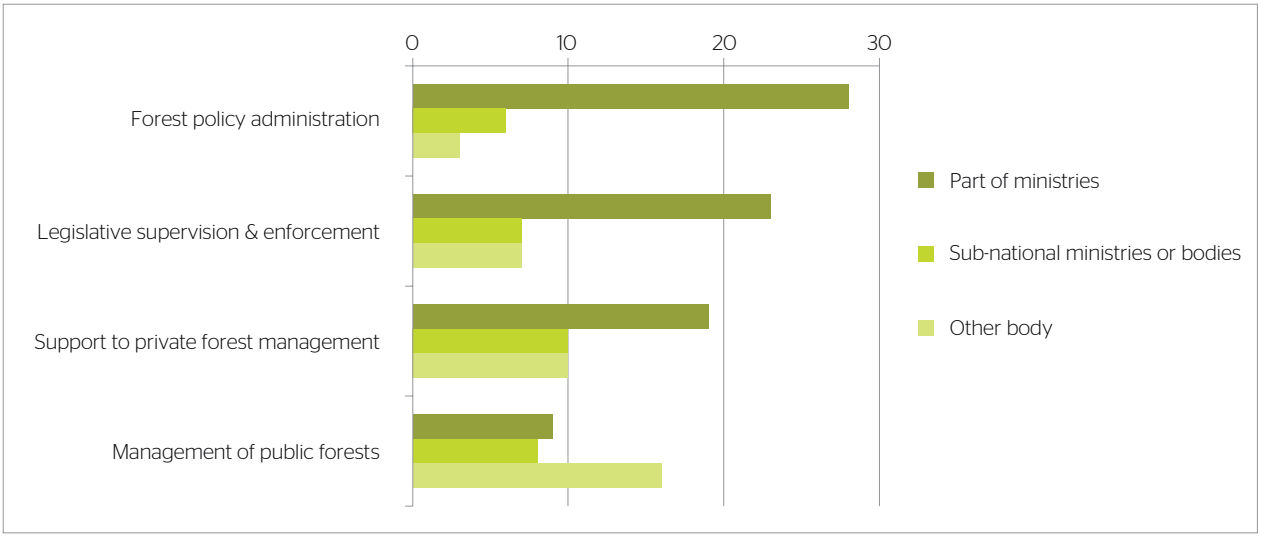

Figure 2. Institutional arrangements for main functions (number of countries) as reported in 2013

or state forest agency/services, which are not part of a ministry (Iceland, Slovak Republic, Ukraine). Such public organisations also exist at sub-national levels in a number of countries (e.g. some of the German federal states). In 9 countries responsibilities lie exclusively with central government (Cyprus, Hungary, Luxembourg, Portugal, Turkey, United Kingdom) and in 8 countries exclusively at sub-national level (Belgium, France, Germany and Norway). In some countries responsibilities are shared between several ministries (e.g. Czech Republic, Italy, Slovenia).

Around 210,000 persons work in forest-related public organisations in Europe, mostly in the management of public forests

Some 26 countries reported a total of 209,579 forest-related employees in public organisations working in the area of forests (full time equivalent, FTE, 2013 estimate). At 49,700 Ukraine has the highest number of employees, followed by Turkey (40,658), Poland (27,584) and Romania (17,623). The large number of employees reported under the "others" category in Turkey involves those employed in non-technical jobs at the General Directorate of Forests in addition to engineers, managers and other technical staff. The largest employers staff in public organisations working in the area of forests in Western Europe are France (10,470) and Spain (10,165) (see Figure 3).

High numbers of public forests management employees are employed in countries with large public forests and in which citizens expect extensive social services from forests

Public forests management employees comprise by far the largest share of the total public staff reported in the Forest Europe region (85.5% of total estimated staff reported by 18 countries). Where a significant amount of forests is under state forest management, around 80-95% of all staff are reported as working in the management of public forests. The biggest employers of public forest-related staff managing large areas of public forests are Hungary, Turkey, Romania, Poland, and France.

On average, one public forest employee (1 FTE) manages around 632 ha of public forests (equivalent to about 1.58 employees per 1,000 hectares). However, the figures vary considerably across Europe and range from 0.1 employees per 1,000 ha in Sweden to over 5 employees per 1,000 ha in Cyprus or Croatia. In Hungary, the government's public employment programme contributed to an additional temporary workforce of ca. 3,863 (FTE) in the state-owned forest companies. If added to the public forests management staff, this gives a total staff of 6,938 (FTE) or ca. 8 employees per 1,000 ha in the management of public forests in this country.

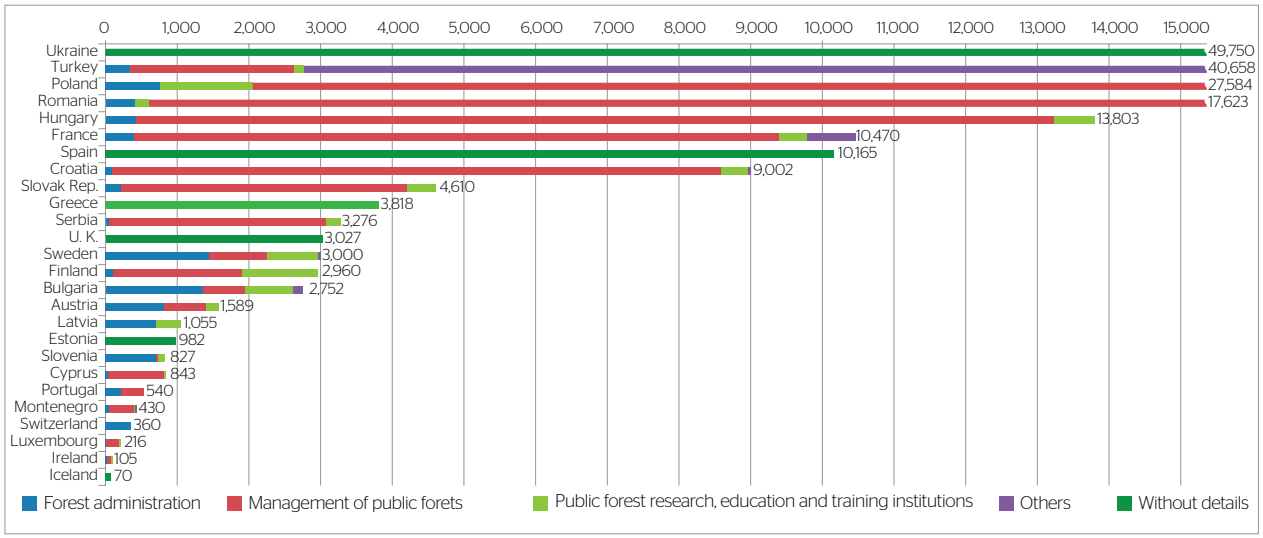

Figure 3. Total forest-related staff in 2013, full time equivalent (reported by 26 countries and divided into categories where possible)

Higher numbers of public staff per ha tend to be employed in countries in which citizens expect extensive social and environmental services, particularly recreation, and in Eastern European countries with formerly planned economies (see Figure 4).

A public administration workforce of 20,227 was reported by 24 countries, representing 72.6% of Europe's forest and other wooded land area. Statistically, one person (FTE) is responsible for the administration of an average area of 8,061 ha. This figure varies considerably and ranges from 0.005 FTE per 1,000 ha FOWL (equivalent to 0.5 FTE per 100,000 ha) in Finland to over 0.4 FTE per 1,000 ha FOWL (40 FTE per 100,000 ha) in Slovenia, Greece and Italy (see Figure 5). This variation could be due to many factors including the proportion of public and private forests, the services forests and/or the public entity are expected to provide to the public, different strategies on the outsourcing of tasks to bodies that are not strictly public, and the use of different administrative approaches and procedures.

As reported by 21 countries, the public research, education and training institution workforce in the area of forests comprised 7,642 full time equivalents in 2013. This is equivalent to an average of 4% of the total reported workforce. However, this share varies greatly between countries. In 2 countries (Finland, Latvia) over one third of all staff in forest-related public organisations

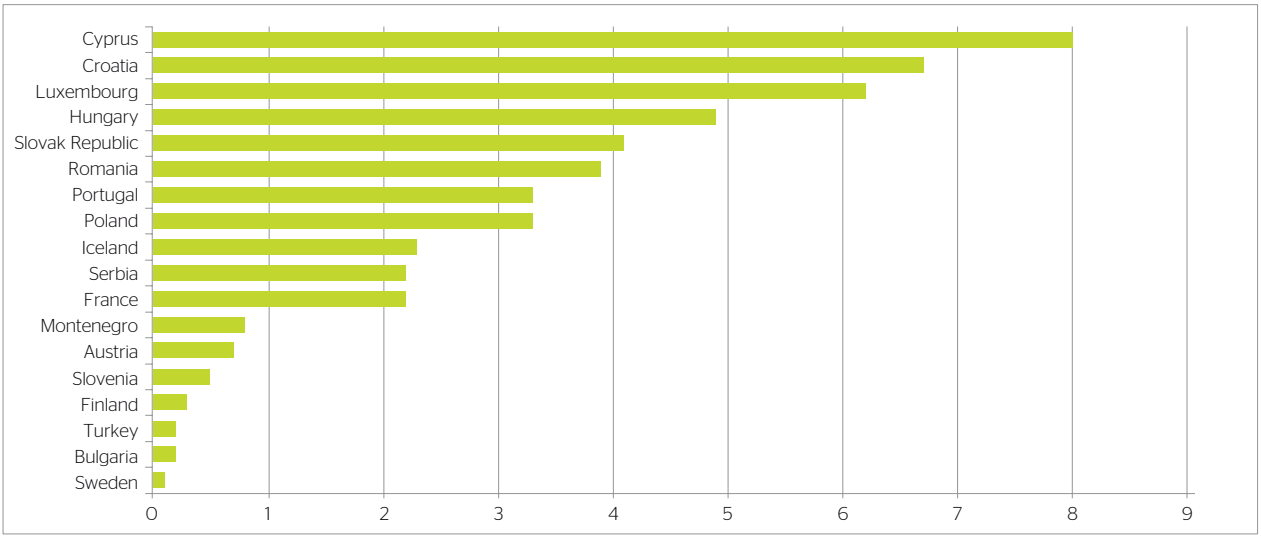

Figure 4. Public forest management staff (FTE) per 1,000 ha of public forests in 2013

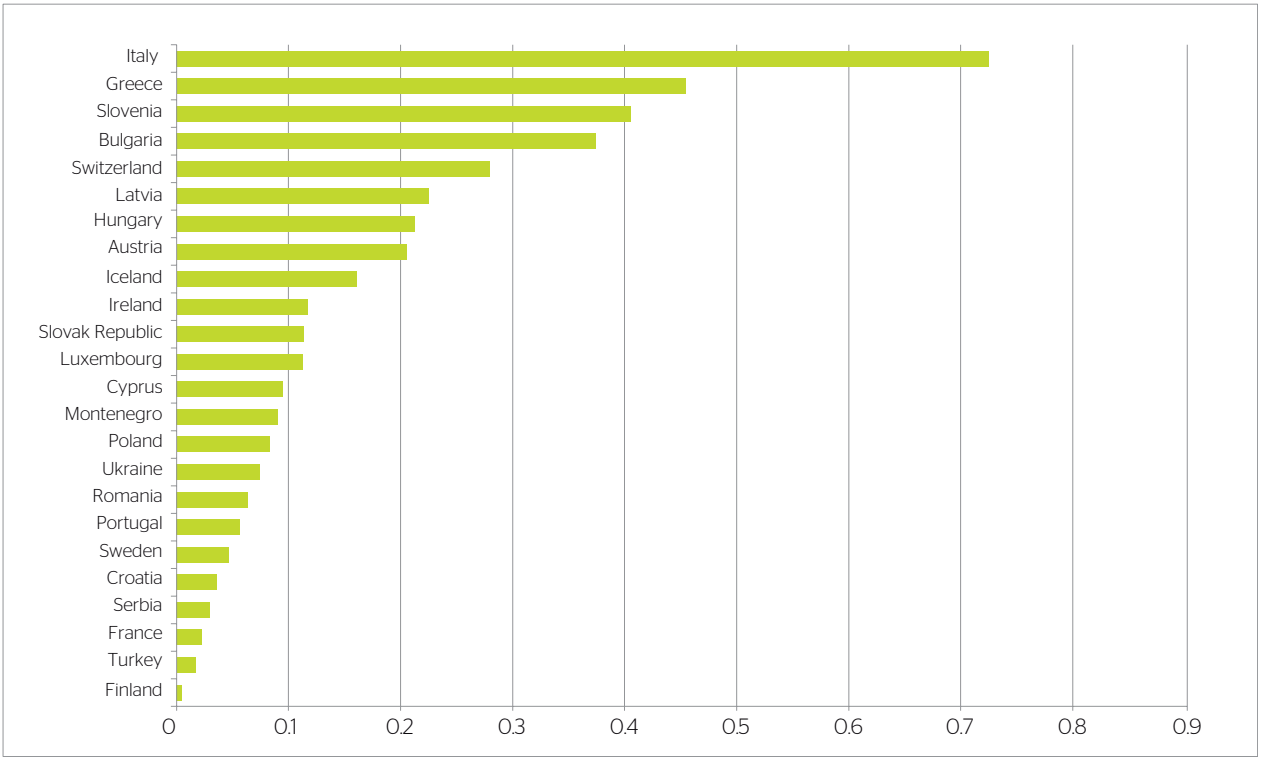

Figure 5. Public forest administration staff per 1,000 ha FOWL in 2013

work in research, education and training; these are followed by Sweden and Bulgaria where the share is around 25%. In a majority of countries, however, this share is very low. Poland and Finland alone reported employing 1,000 or more people in these professions (see Figure 6).

Trends and explanations

Forestry administration units continue to be merged with government bodies responsible for natural resources, rural development and/or nature conservation

Significant changes relating to institutional frameworks have been implemented in 14 out of 34 reporting countries since 2011. The most common change in institutional frameworks since 2011 concerned the creation of administrative units which integrated different natural resources sectors in a single body (e.g. in Finland, United Kingdom) and mergers with bodies that address nature conservation (e.g. Poland, Portugal). In some countries, including Finland, research and technical institutes were also restructured and merged. Several countries also transferred forest competencies to parent bodies focused on rural development (Spain) and industrial development (Slovak Republic). The second most frequent change reported involved downsizing measures driven directly or indirectly by the economic crisis (e.g. in Cyprus, Greece, Italy, Slovak Republic).

Finland

Several separate research institutions in Finland - MTT Agrifood Research Finland, the Finnish Forest Research Institute (Metla), the Finnish Game and Fisheries Research Institute (RKTL) and the statistical services of the Information Centre of the Ministry of Agriculture and Forestry (Tike) - merged into one organization called Natural Resources Institute Finland (LUKE) from January 2015. The advantage offered by the restructuring of research activities lies in the resulting synergies in multi-disciplinary forestry research topics. Many topics, such as climate change, cover several research areas.

Slovak Republic

As a result of state-driven rationalisation, on January 1, 2013 all 8 regional forest offices were closed and their responsibilities were transferred to the district offices. A new Forest Management and Wood Processing section was established at the Ministry of Agriculture, enforcing thus the link between these two areas.

Portugal

The national forest and nature conservation authorities were merged in one national agency (Institute for Nature Conservation and Forests - ICNF, 2012). The main objective was to increase the efficiency of the administration.

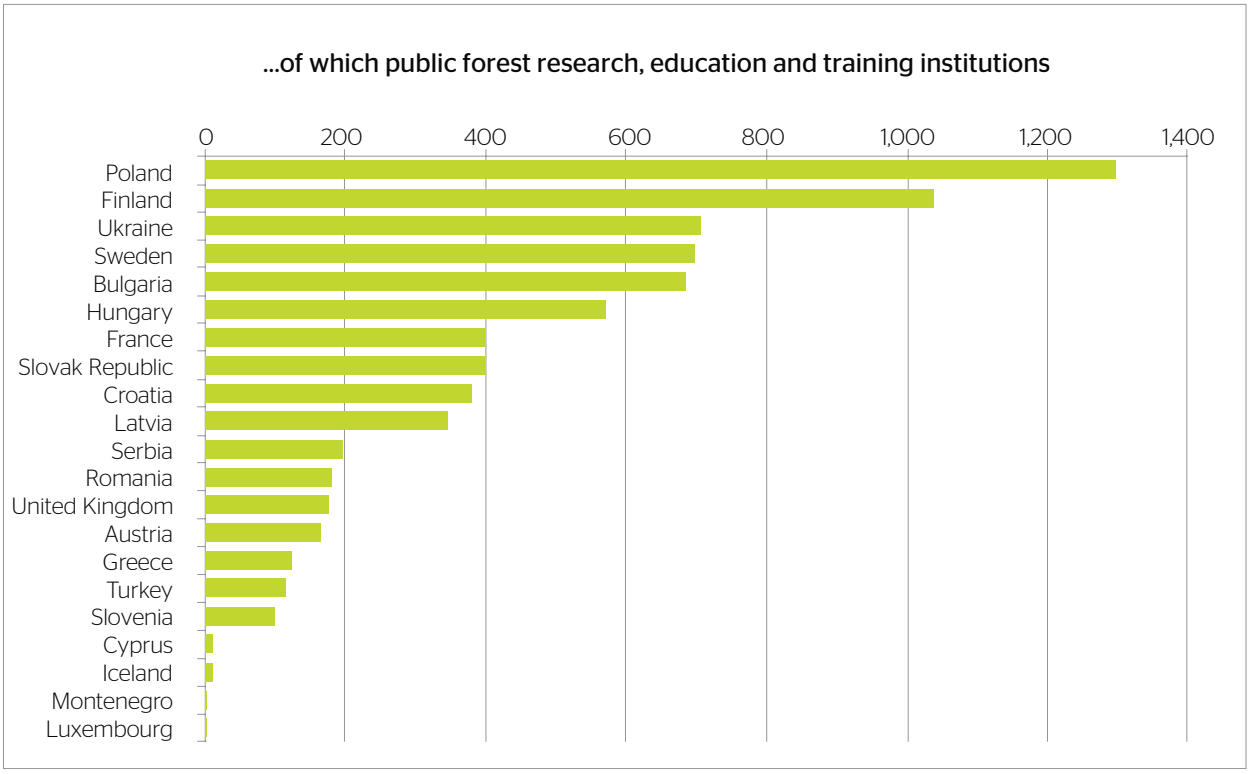

Figure 6. Forest-related staff in public research, education and training institutions in 2013 (FTE equivalent)

Some Eastern European countries, including Bulgaria and Montenegro, continued to adapt state forest management arrangements towards the functional differentiation of administrative and control functions.

Bulgaria

The adoption of a new Law on Forests (LF) determined the division of functions between the Ministry of Agriculture and Food and the Executive Forest Agency (EFA). The state forest administration, EFA, performs control functions and, in accordance with art. 163 of the LF, the 6 State Forest Enterprises implement the management activities in the state-owned forest territories.

Compared to 2011, fewer countries reported the implementation of further measures to increase the support provided to private forest owners. However, work in this area continued in Eastern Europe and other countries, e.g. through a specific law relating to the Extension Service in Croatia. In Finland the "Finnish Forest Centre" commenced operations in early 2012; its activities include the promotion of forestry and related livelihoods, advising landowners on how to care for and benefit from their forests and the ecosystems they contain, the collection and sharing of data related to Finland's forests, and the enforcement of the forestry legislation.

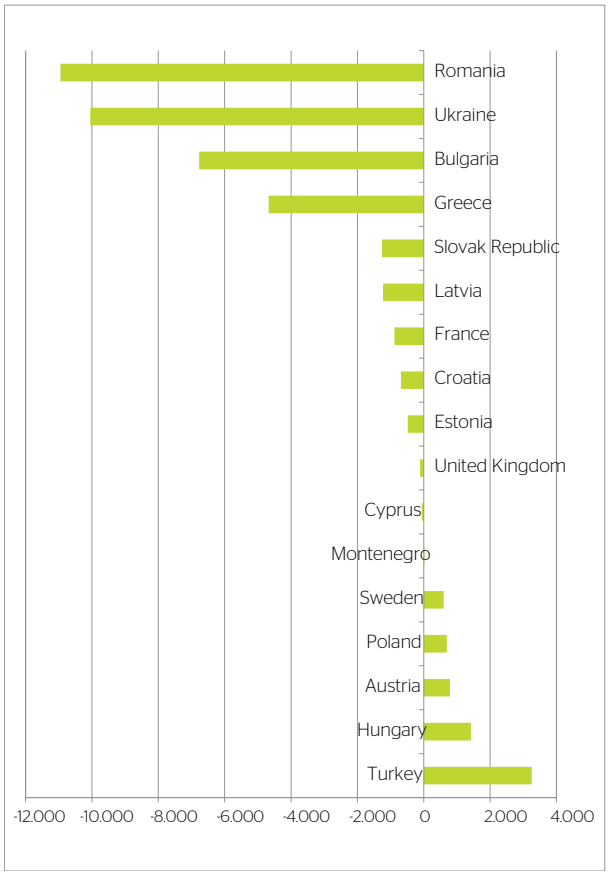

Figure 7. Change in total estimate of FTE public staff 2009-2013, divided into subclasses where possible

The number of forest-related public employees reported for 2013 is around 14% lower than that reported for 2010

The total size of the forest-related public staff (FTE) changed between 2010 and 2013 in the 18 countries for which data is available for both reference years.

Whereas a total of 12 countries reported staff reductions, 6 countries experienced an increase in their workforces. Overall, the net shift in employment among the reporting countries amounts to a total reduction of around 29,235 public employees (see Figure 7).

The decrease of 11,000 public forest employees in Romania is due to both administrative restructuring following forest restitution and an artefact related to some reporting challenges. The reason for the decrease of round 10,000 public forests staff in Ukraine is the outsourcing of certain activities/forestry operations to private contractors and institutional reforms in the public forest sector (optimization of structures). Bulgaria reported a notable reduction of 71% in public staff due to the establishment of six new state-owned forest enterprises, which have since appointed the majority of this personnel, giving a minimal or no net loss in staff numbers. Greece and Latvia also reported public forest employment figures that are 55% lower than in 2010. The decline in employment in Greece is due to the higher rate of retirements and the significant reduction in the recruitment of staff due to the financial crisis.

The countries which reported more staff in 2013 than in 2010 include Hungary, Turkey, Austria, Poland and Sweden. In Hungary, the government's public employment programme contributed to the hiring of an additional temporary workforce of ca. 3,863 (FTE) by state-owned forest companies. If added to the public forest management staff, this gives a workforce of 9,358 (FTE) or ca. 8 employees per 1,000 ha managing public forests.

Indicator A3 Legal/regulatory frameworks and international commitments

Introduction

The national forest laws and their complementary regulations, nature and forest protection regulations, hunting and wildlife management legislation, land-use and related planning acts, and, in some cases, the constitution are the cornerstones of the legal/regulatory framework relating to a country's forests.

At international level, FOREST EUROPE has adopted a total of 12 Resolutions at four Ministerial Conferences since 1990. A range of EU regulations and directives also address forest matters and are legally binding for EU Member States. A number of further conventions and political processes relating to forests address specific topics or regions within Europe, for example, the Environment for Europe process, the Convention on Long-Range Transboundary Air Pollution, the Alpine Convention, the Carpathian Convention and the European Landscape Convention.

In addition, forestry-related international legal instruments, adopted, in particular, during and after the United Nations Conference on Environment and Development (UNCED) in 1992, and specific regional conventions and agreements pertaining to forests directly influence or determine national forest-related legislation.

Status

Forest laws currently in force are usually less than five years old

Legal authority on central forest matters is laid down in the legislation enacted by the parliaments of 31 of the 34 reporting signatories. In 8 of these countries, forest matters are also covered in the constitution. In 20 countries authority on main forest matters lies exclusively at central government level. In four countries (Austria, Poland, Spain, United Kingdom) competences are shared between central and sub-national levels. In three countries (Belgium, Germany, Switzerland) formal authority on main forest matters lies at regional, federal or cantonal levels. In the United Kingdom administration is devolved and in Belgium formal authority lies at the level of the regions.

In 17 countries the main forest legislation in force was enacted in or prior to 2005, while in 10 countries the main legislation in force is less than ten years old. A number of countries have enacted new legislation since 2011, including Ireland (in 2014, replacing the Forestry Act of 1947), Cyprus (in 2012, replacing the Forest Law of 1967) and others. On average, one country has enacted a new forest law every year in recent years. A total of 18 countries reported on amendments to the main law since 2011, many of which were made in 2014 (Table 2). Most of these changes concerned minor technical adjustments.

Table 2. Year of enactment of forest legislation in force and latest amendments since 2000

Year	COUNTRIES date of *enactment* of forest legislation in force	COUNTRIES date of *latest amendments* of forest legislation in force
Prior to 2005	Austria, Czech Republic, Denmark, France, Finland, Greece, Iceland, Italy, Latvia, Poland, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom	
2005	Croatia, Slovak Republic	
2006	Norway, Ukraine, Portugal	Spain, United Kingdom
2007	Estonia, Russian Federation	Albania
2008	Romania	Croatia, Estonia, France
2009	Hungary	
2010	Montenegro	
2011	Bulgaria, Serbia	Latvia
2012	Cyprus	Serbia
2013		Austria, Finland, Switzerland
2014	Luxembourg, Ireland	Bulgaria, Czech Republic, France, Greece, Luxembourg, Norway, Poland, Romania, Slovak Republic, Slovenia, Sweden, Turkey, Ukraine, Denmark

A total of 11 countries make explicit reference to the FOREST EUROPE definition of SFM in their national legal/regulatory framework and 9 countries to the FOREST EUROPE C&I for SFM (see Figure 8) (Criteria & indicators for Sustainable Forest Management). Hungary reported that its legal/regulatory framework refers to FOREST EUROPE resolutions.

The new EU Forest Strategy provides a key reference for EU forest-related policy development

Forest and forest industry policy does not constitute a common EU policy area as defined by the EU treaties. It remains an explicit Member State area of competence. Nevertheless, the EU has legal competence in a range of areas that are forest related, for which new regulations, directives, Council conclusions or communications were issued or entered into force since 2011, see Table 3. A new EU Forest Strategy was adopted in 2013, which aims to enhance coordination and facilitate the coherence between forest-related policies and other sectors that influence forest management. It is intended to provide the key reference in EU forest-related policy development.

Trends and explanations

Half of countries amended legal and regulatory frameworks since 2011

15 of 34 reporting signatories reported changes in their legal or regulatory frameworks. Some countries implemented fundamental changes, including the passing of a new Forestry Act (Ireland) or issuing of an extensive package of new forest acts to accompany the restructuring of the sector (Finland). The most common amendments in the legal/regulatory frameworks address issues concerning the governance of land-use change (Croatia, Greece, Portugal, Switzerland, Turkey, Ukraine). Several countries also reported on

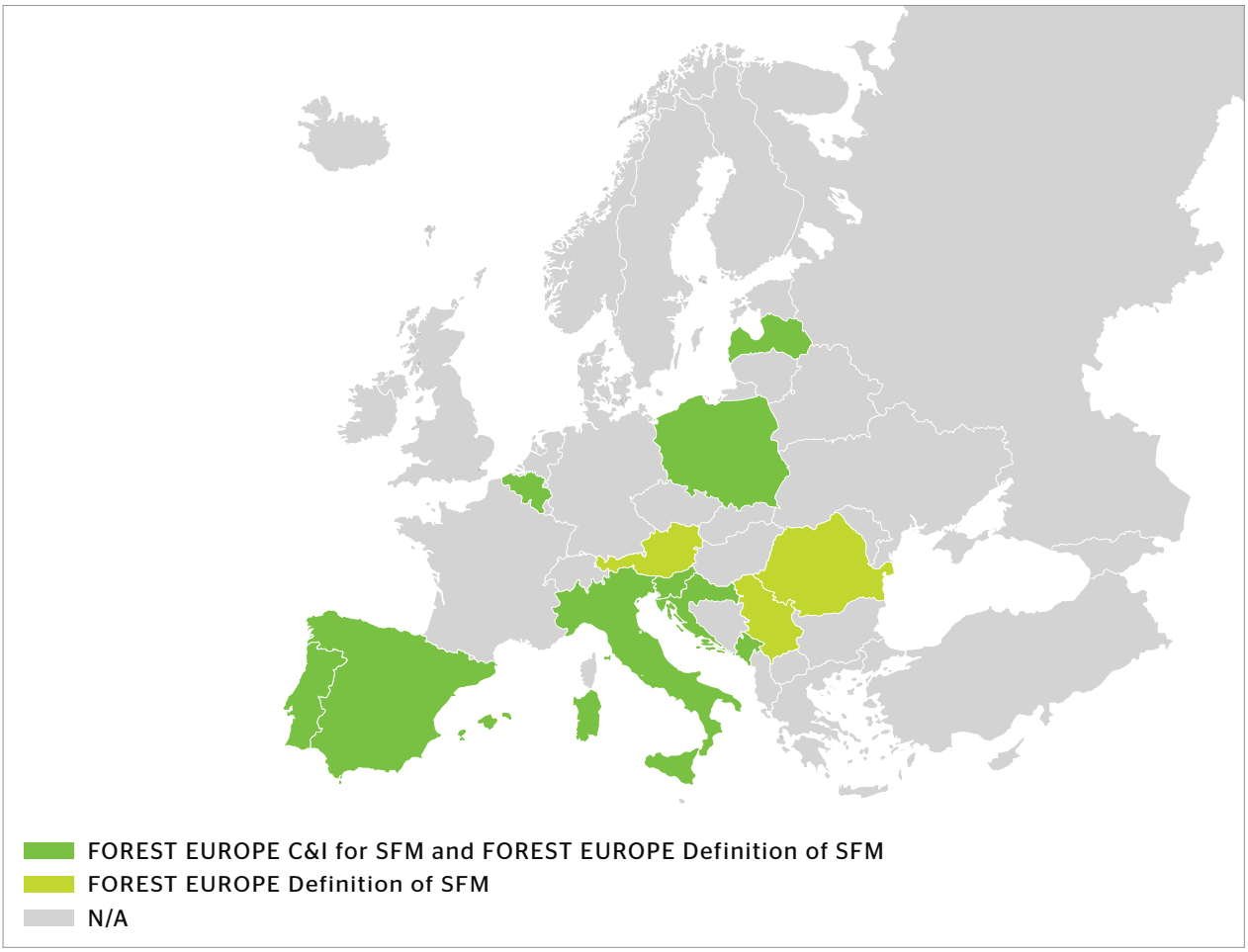

Figure 8. Countries that reported the use of FOREST EUROPE definitions and C&I for SFM in 2013 in their national legal/regulatory framework

action for the integration of the EU FLEGT and EU Timber Regulation as the most significant change to have arisen since 2011 (Austria, Czech Republic, United Kingdom).

Follow-up to international commitments focused on EU Timber Regulation and FOREST EUROPE Oslo Ministerial Decision and Resolutions

With regard to international commitments, 20 countries stated that they have carried out significant initiatives since 2011. Such references mainly concerned the implementation of the EU Timber Regulation (Belgium, Bulgaria, Czech Republic, France, Portugal, Slovenia, Ireland) and the FOREST EUROPE 2011 Oslo Ministerial Decision and Resolutions (Austria, Iceland, Montenegro, Spain, Sweden) and work implemented in the context of the Carpathian Convention (Romania, Slovak Republic, Ukraine).

Few countries made reference to the implementation of commitments in relation to the Rio Conventions on Climate Change and Biological Diversity (Finland, France, Sweden). Only 3 countries made reference to the UNFF non-legally binding instrument on forests, which was adopted in 2007 (Bulgaria, Spain, Sweden).

Romania

Collaboration for the preparation of the Strategic Action Plan for the implementation of the Protocol on sustainable forest management under the Framework Convention on the Protection and Sustainable Development of the Carpathians.

Table 3. EU regulations and directives, Council conclusions and communications related to forests and the forest sector issued since 2011

Area of EU activity related to forests	Legal / regulatory instruments of the EU and further non-legally binding instruments used
EU Forest Strategy	European Commission Communication COM(2013) 659, "A new EU Forest Strategy: for forests and the forest-based sector" and related Council conclusions on the new EU Forest Strategy (19 May 2014, 9944/14) European Parliament Report (A8-0126/2015) on 'A new EU Forest Strategy: for forests and the forest-based sector' (2014/2223(INI), Committee on Agriculture and Rural Development (1 April 2015)
Forestry in rural development	Regulation (EU) nº 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, The Cohesion Fund, The European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Funds, the European Social Fund and the Cohesion Fund repealing Regulation (EC) nº 1083/2006 (legally binding) Regulation (EU) nº 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (legally binding) European Union Guidelines for State aid in the agricultural and forestry sectors and in rural areas 2014 to 2020, 2014/C 204/01
Forest-based and related industries	European Commission Blueprint for the EU forest-based industries SWD(2013) 343 final European Commission Communication COM(2012) 60 final Innovating for Sustainable Growth: A Bioeconomy for Europe European Commission Communication COM (2012) 582. A Stronger European Industry for Growth and Economic Recovery
Forests and biodiversity	EU Regulation 1293/2013 Programme for the Environment and Climate Action (LIFE) European Parliament resolution of 20 April 2012 on our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011/2307(INI)) Environmental Council (ENV) conclusions on the implementation of the EU 2020 biodiversity Strategy 19 December 2011. COM(2011) 244
Forest and climate change	Decision No 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities EU strategy on adaptation to climate change, 2013
Forest and research	EU Regulation 1291/2013 Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)

Indicator A4 Financial instruments and economic policy

Introduction

The Indicator "Financial instruments/economic policy" addresses two separate areas. Financial instruments are deployed to pursue a wide range of public goals by providing financial incentives or disincentives for the target group. Private forest holdings are subject to tax regimes and receive financial incentives, e.g. in the form of grants, loans or compensation. In the case of state forest agencies funding is distributed through budget allocations in accordance with the legislation. "Economic policy" addresses the economic dimension of sustainable forest management more broadly. The following section will address, first, the broader aspect of "economic policy" and then focus on more specific financial instruments.

Status

The management of state-owned forests is financially self-sufficient or profit-oriented in 16 countries

26 countries specified policy objectives or main measures taken to address economic aspects of publicly owned forests. 16 countries reported that the financial arrangements for state-owned forests are designed in such a way that these are financially self-sufficient or profitable. This is also reflected in the fact that 8 countries reported that the main economic objective for public forests is economic self-sufficiency (France, Montenegro, Poland, Sweden, Ireland) and/or economic profitability (Austria, Finland, Latvia) and the provision of revenue to the state. 18 countries provide additional financial support from government for forest management (see Table 4).

Around half (11) of the responding countries stated that their economic policy for public forests aims to ensure the provision of public goods, protect resources, or enhance efficiency and productivity through different forms of subsidies, preferential conditions for grants, compensation, or tax reductions. These range from support for the improvement and maintenance of the productivity and quality of state forests (Hungary, Montenegro, Portugal, United Kingdom), improvement of the competitiveness and viability of forestry (Slovak Republic, Romania), support for afforestation/reforestation (Poland, Spain, Ukraine), measures for the protection of forests (Czech Republic, Italy) and reduction of the risk of forest fires (Portugal, Slovenia), and other measures for improving the supply of raw materials (Luxembourg, Romania, United Kingdom).

Montenegro

The state forest sector is mainly self-financing and channelled through the state budget. The state budget programme for forestry (e.g. forestry budget) is prepared and adopted each year. 30% of revenues from state forest concessions is allocated to state revenue while 70% of concession revenues is allocated to the budgets of the municipalities.

Sweden

The forest sector (incl. both public and private forests) should be self-financing and self-sustained in the long run. Revenues from forestry should be reinvested in sustainable forest management. In principle no direct subsidies exist for wood production. However some state subsidies are provided for forestry measures in order to enhance environmental values in the forest.

Austria

The components of forest-related financial instruments and economic policies in Austria are delicately tuned to offer incentives for sustainable forest utilisation while at the same time safeguarding all important services provided by forests. Forests that are viable for the long term do not come at zero cost. While gaining added value from forest utilisation in the form of income and ecosystem services, investments must be made to keep the system running. At the top of the investments range, those for reforestation, forest protection and forest tending are made by the forestry sector itself. In addition, public investments are necessary to ensure vital ecosystem services like the protection against natural hazards and long-term maintenance of biodiversity. Public subsidies are granted to stimulate and refine sustainable forest management. Like every other branch of the economy, forestry must pay taxes on earnings in turn.

Economic policies for private forests aim to ensure and enhance the viability of the sustainable provision of benefits

5 countries reported that the objectives for private forests are similar or identical to those for publicly owned forests (Portugal, Slovak Republic, Romania, Switzerland, Sweden). Enhancing private forest development and its economic viability is a common general objective of the economic policies and is reported, for example, by Hungary, Latvia, Montenegro and the Slovak Republic. Several countries also reported

Table 4. Financial arrangements related to state-owned forests and their management in 2013

Financial arrangements	Countries
Profit/financially self-sufficient forest management	Bulgaria, Croatia, Czech Republic, Finland, Germany, Hungary, Latvia, Montenegro, Norway, Poland, Romania, Slovenia, Spain, Sweden, Turkey, Ireland
Additional financial support from government to forest management	Belgium, Cyprus, Czech Republic, France, Greece, Iceland, Italy, Luxembourg, Portugal, Romania, Slovak Republic, Spain, Switzerland, Turkey, Ukraine, United Kingdom, Serbia, Denmark

that ensuring and enhancing the supply of wood and other benefits from forests is an explicit economic policy (e.g. France, Norway, United Kingdom).

Latvia

The basic principle is the development of a market economy and free competition in the forest sector through the establishment of an appropriate legal system and reduction of state intervention in economic activity. If economic activities in forests are restricted due to the ecological or social functions, forest owners are entitled to compensation.

France

To improve the mobilisation of wood and ensure the profitability and sustainability of forest management. To develop forestry as a source of economic growth and employment, promote the use of timber in the construction sector the use of wood as an energy source with due respect to SFM and the existing forest-based industry.

Ireland

The objectives of the main measures taken to address aspects of privately owned forests are, inter alia, to (i) increase the national forest area, (ii) support and encourage the sustainable management of existing forests, (iii) increase the level of output of forest goods and services, and (iv) support the economic viability, of privately owned forests.

Subsidies are the most common financial instrument used by 22 countries to influence private forest management

Grants/subsidies are the most commonly reported financial instrument used. These are mainly provided for NATURA 2000 sites (Belgium, Hungary, Denmark), ecosystem services (Croatia), the sustainable management of private forests (Czech Republic, Finland, Romania), and afforestation and management of woodlands for social benefits (Iceland, Ireland, Hungary, Denmark, United Kingdom). Funds are also granted to forest owners for investment in forest infrastructure (France, Norway), the use of forest biomass for energy (Montenegro), silviculture, forestry planning, environmental measures and forest extension (Norway), forest management plans, national parks, forest fire protection, conservation measures against bark beetle (Slovak Republic), and the maintenance of protective forests (Switzerland).

The national rural development programmes co-financed by the EU provide support for private forest management through subsidies in some of the reporting countries (as reported e.g. by Austria, Hungary, Sweden, Italy).

15 countries reported the use of tax measures, including the reduction of or exemption from land or forest taxes (e.g. Czech Republic, France, Iceland, Latvia, Norway, Poland, Romania, Denmark, Ireland, Spain). 7 countries reported on the existence of national public funds that provide support for the restoration and maintenance of protective forest functions (Austria), forestry service activities for private forest owners (Montenegro), afforestation and establishment of forest belts/windbreaks on private land and for maintenance of respective plantations up to canopy closure (Romania). Government grants are provided to private forest owners in Ireland to encourage the sustainable management of private forests. A few countries reported incentives in the form of free plants, technical advice etc. for greening private lands (Cyprus), and agreements for the improvement of forest biodiversity and the economic efficiency and performance of the forestry sector (Switzerland) (see Figure 9).

Only 3 countries reported on investment support measures (Austria, Spain, Sweden). For example,

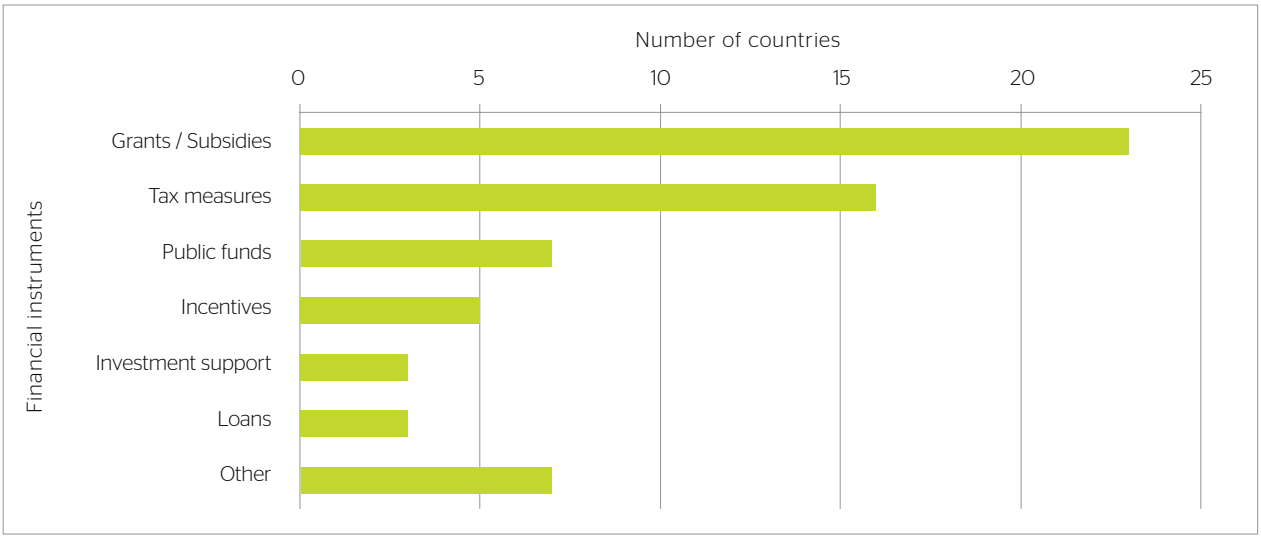

Figure 9. Use of financial instruments to influence private forest management in 2013

Sweden provides support for investments yielding higher added-value including innovative business ideas, e.g. eco-tourism, product refinement and development. 3 countries reported the use of loans. In Finland, minor loans are granted to private forest owners; in France loans are used for investment in the modernisation of sawmills; in Switzerland investment loans are provided to the cantons for improving the structure of forest enterprises and their processing techniques. 7 countries (Bulgaria, Czech Republic, Latvia, Montenegro, United Kingdom, Spain, Romania) reported on the use of other financial instruments for private forest management. Of these, the most frequently reported one is the provision of technical and management support to forest owners. Other countries referred to compensation for forest management restrictions (Latvia) and agreements with banks about social activities, e.g. La Rioja Forest Administrations (Spain). Based on its agreement with the la Rioja forest administration, the Caixa Bank invested EUR 350,000 mainly in afforestation projects to assist in the mitigation of climate change.

Transfer payments are most frequently used for the conservation of forest biodiversity, followed by support for forest inventory and planning, and the protection of soil and water

21 signatories (of 34) reported on the use of transfer payments for promoting the conservation of forest biodiversity, and 16 countries use transfer payments to support protected areas. In comparison, 18 countries use transfer payments to increase and improve inventory and management planning for the forest resource base, and 18 countries use payments for the protection of soil and water, see Figure 10.

Figure 11 presents an overview of total transfer payments (support to private forest management) per country in 2013. Such payments were reported by 17 countries as totalling some EUR 825 million in 2013 (2011: EUR 1,697 million - 29 countries reported). Statistically, this would amount to an average of around EUR 11.4/ha/year of transfer payments for private forest management. Based on the reported data, Ireland spent EUR 333/ha/year, followed by Switzerland with EUR 174/ha/year. Norway reported support of around EUR 4.4/ha/year while the amounts paid in Sweden, France, Cyprus and Finland were somewhat higher. In comparison, Slovenia and Estonia reported average payments of EUR 2.5/ha/year. The figures reported by Serbia and Romania indicate transfer payments of less than EUR 1/ha/year. For the FOREST EUROPE region as a whole, around 86.5% of payment is reported as domestic funding and only around 13.5% as external funding.

European Union

Forests and the forest sector currently receive significant EU funding. Forestry measures under the Rural Development Regulation are the EU Forest Strategy's resource backbone (90% of total EU forestry funding). According to the latest cumulative declared expenditure from Member States, 3.8bn€ have been used in the period 2007-2013 for forestry specific measures under EU Rural Development Regulation. In addition to the forestry-specific measures substantial amounts of funding is directed to forestry through other horizontal measures which can cover both agricultural and forestry activities. Although it will depend on Member States' Rural Development Plans, a similar level of spending to that in the current period could be expected for 2014-2020. Other possibilities exist in Horizon2020 (supporting research and innovation actions, including the public-private partnership on bio-based industries), LIFE+ (supporting nature conservation, climate change adaptation, information and protection needs), and the structural funds (that support cohesion projects). Development and climate change policies also provide financing for third countries, in particular through EU development funds, REDD+ and FLEGT.

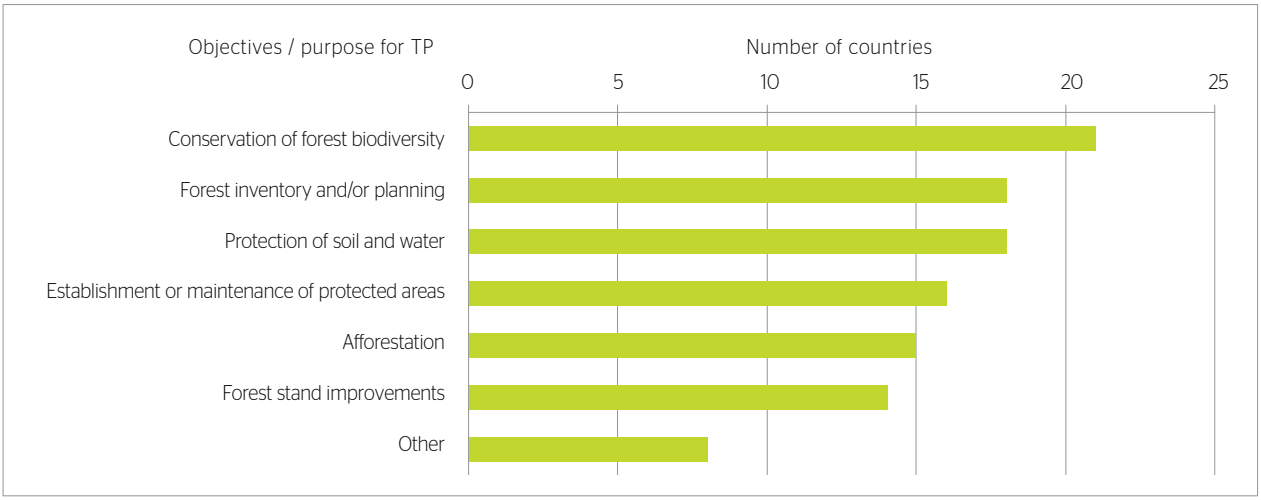

Figure 10. Specific objectives of transfer payments (number of countries) in 2013

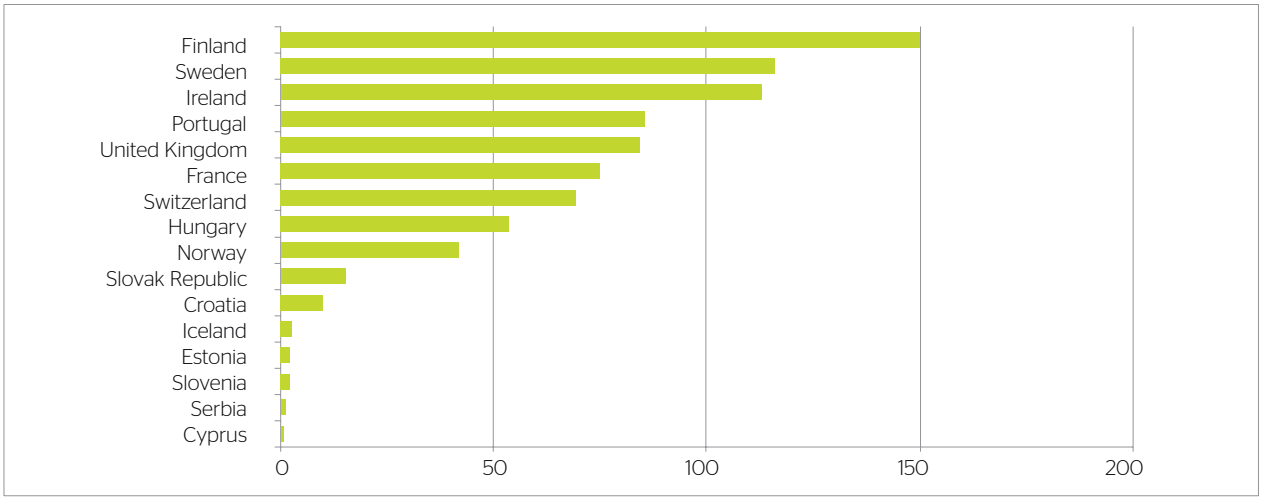

Figure 11. Overview of total transfer payments (million EUR) in 2013

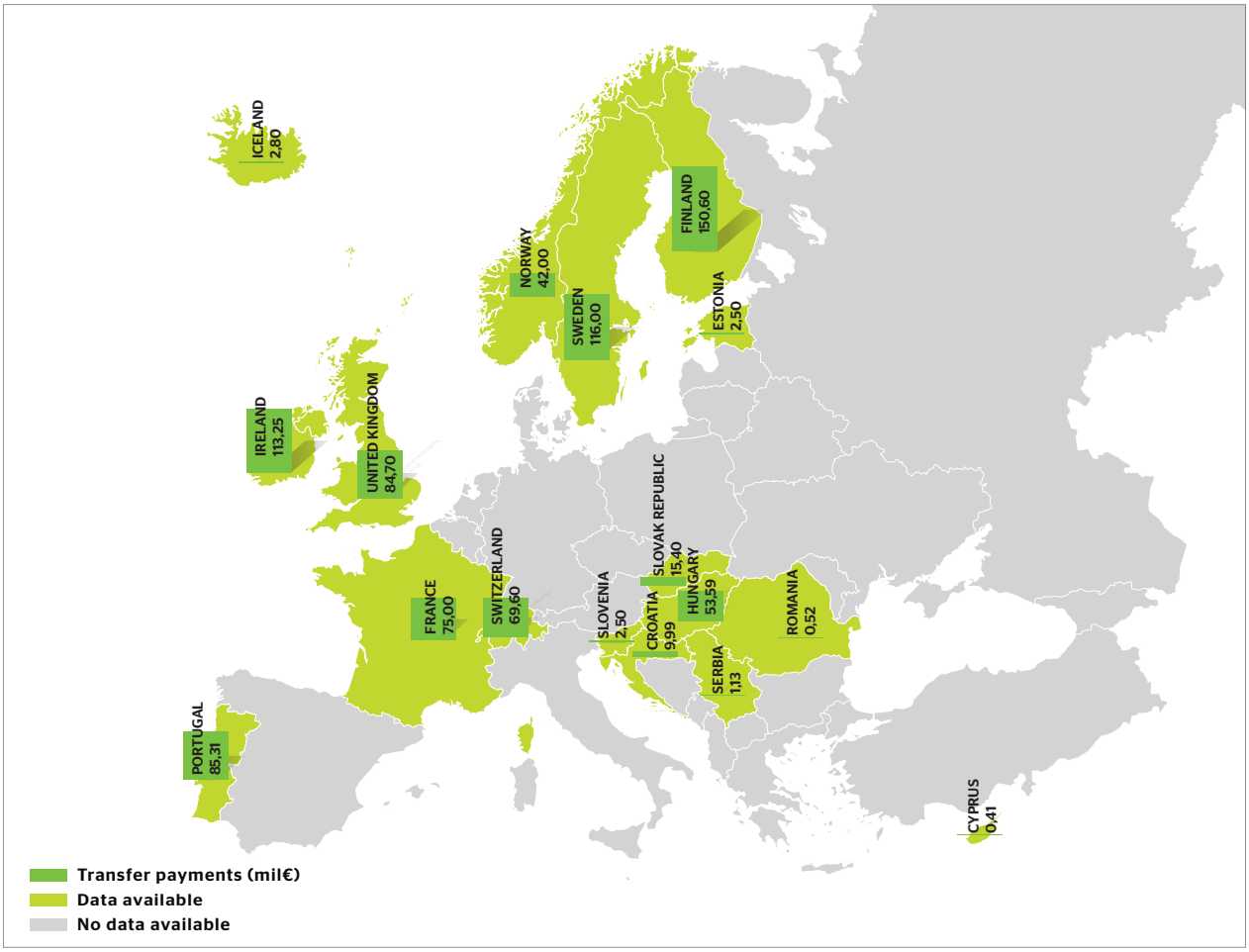

Figure 12. Transfer payments (million EUR) in 2013

Total operating expenditure, i.e. government expenditure on public institutions engaged solely in the forest sector, reported by 20 countries was EUR 2,771 million per year. Some 99.4% of this expenditure was reported as originating from domestic funding with only some EUR 13 million/year from external funding. Statistically, on average, this total sum would amount to around EUR 11.3/ha for operational expenditure on forest and other wooded land per year (Figure 13). The higher figure for operational expenditure in Turkey is due to the fact that a lot of the public expenditures were allocated to combating forest fires.

As reported by 23 countries (representing 80.5% of forest and other wooded land area in the FOREST EUROPE region), total public expenditure by governments on all forest-related activities was EUR 3,234 million in the last available reporting year. Some 94.6% of this expenditure was stated as originating from domestic funding with only around EUR 90 million/year from external funding. Based on the data provided, this total sum would amount on average to around EUR 17.9/ha of total public expenditure on forest and other wooded land per year. According to these figures, the leading countries are Hungary (EUR 106.7/ha), Cyprus (EUR 81.4/ha), and Turkey (EUR 69.4/ha).

Depending on the size of public forests and the arrangements with regard to their management, the allocation of the expenditure tends to vary significantly. Where the management of public forests is undertaken by a separate body, total public expenditure for forest administration tends to account for some 40-80% of all expenditure. Where state forest management is part of government expenditure, its share tends to exceed 50% of total expenditure. Expenditure for public forests

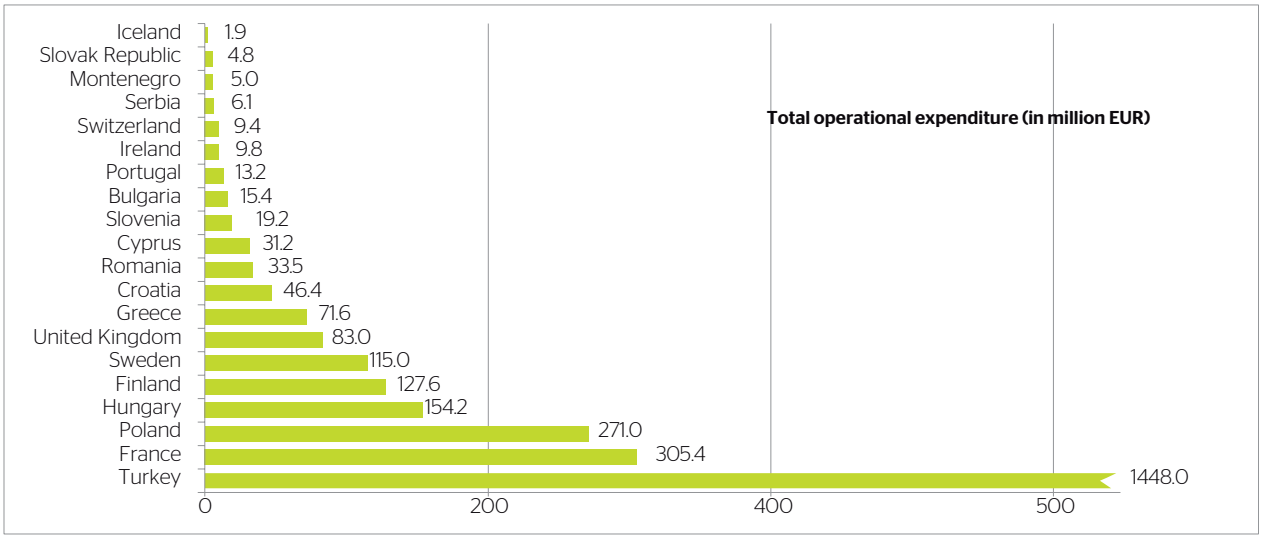

Figure 13. Operational expenditure in the forest sector in million EUR in 2013

research, education and training institutions is around 7% of total public expenditure in the sector on average (ranging from 27.7% in Sweden to 0.2% in Bulgaria and is followed by support for different types of forest associations (around 2.6% of total public expenditures in countries where data is available) (see Fig. 14).

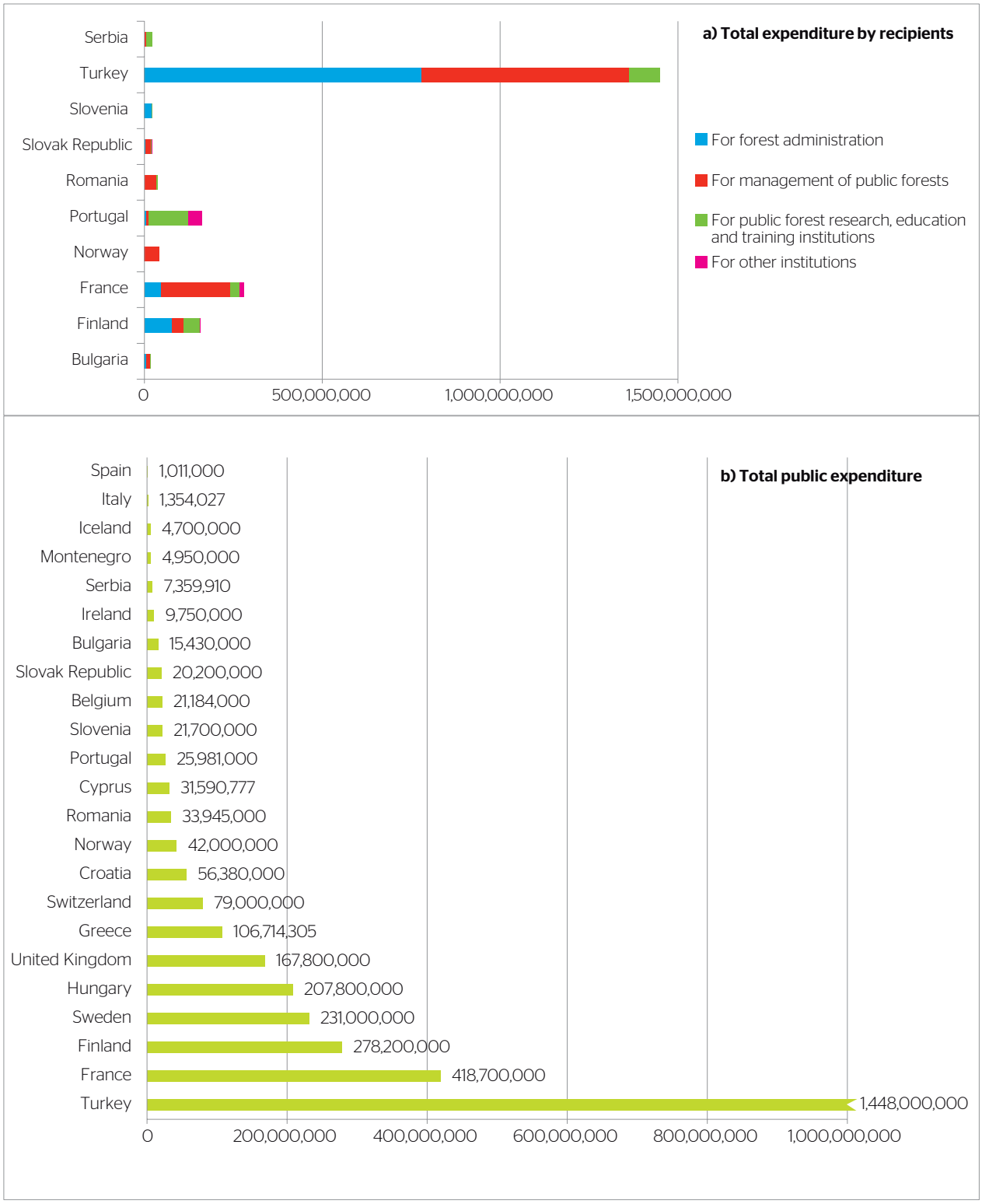

Figure 14. Total expenditure in EUR in 2013. a) Total expenditure as allocated to different recipients. b) Total public expediture

The countries were requested to estimate the total allocations of public expenditure across the six criteria for SFM. The data from the 17 countries that responded indicate that, on average, 25% of all funds are allocated to productive forest functions, around 20% to forest resources and protective functions, and around 10% each to health and vitality, biodiversity and socio-economic functions. As can be seen from Figure 17, the countries indicated very different priorities. For example, Ireland specified that 93% of expenditure goes towards forest resources, Montenegro indicated that 88% of expenditure targets productive forest functions; Romania estimates that over 70% of public expenditure is allocated to protective functions; Ukraine indicated that 69% is used for socio-economic functions; and Sweden specified that 65% of expenditure relates to biodiversity protection.

Trends and explanations

Over half of the countries (23 out of 34) reported "no changes" since 2011 in relation to national economic policy on forests (public and private). 8 countries reported new developments and/or changes. These mostly concerned reductions in taxes and fees (Croatia, Denmark, France, Spain). In some countries the support provided for the forest sector was reduced due to the economic crisis or for other reasons. In Iceland, for example, state financing for forestry has been cut by approximately 50% in real terms since 2009 and this trend is expected to continue. Some countries were less severely affected (e.g. Cyprus) and new funding mechanisms were created in a few countries (e.g. France).

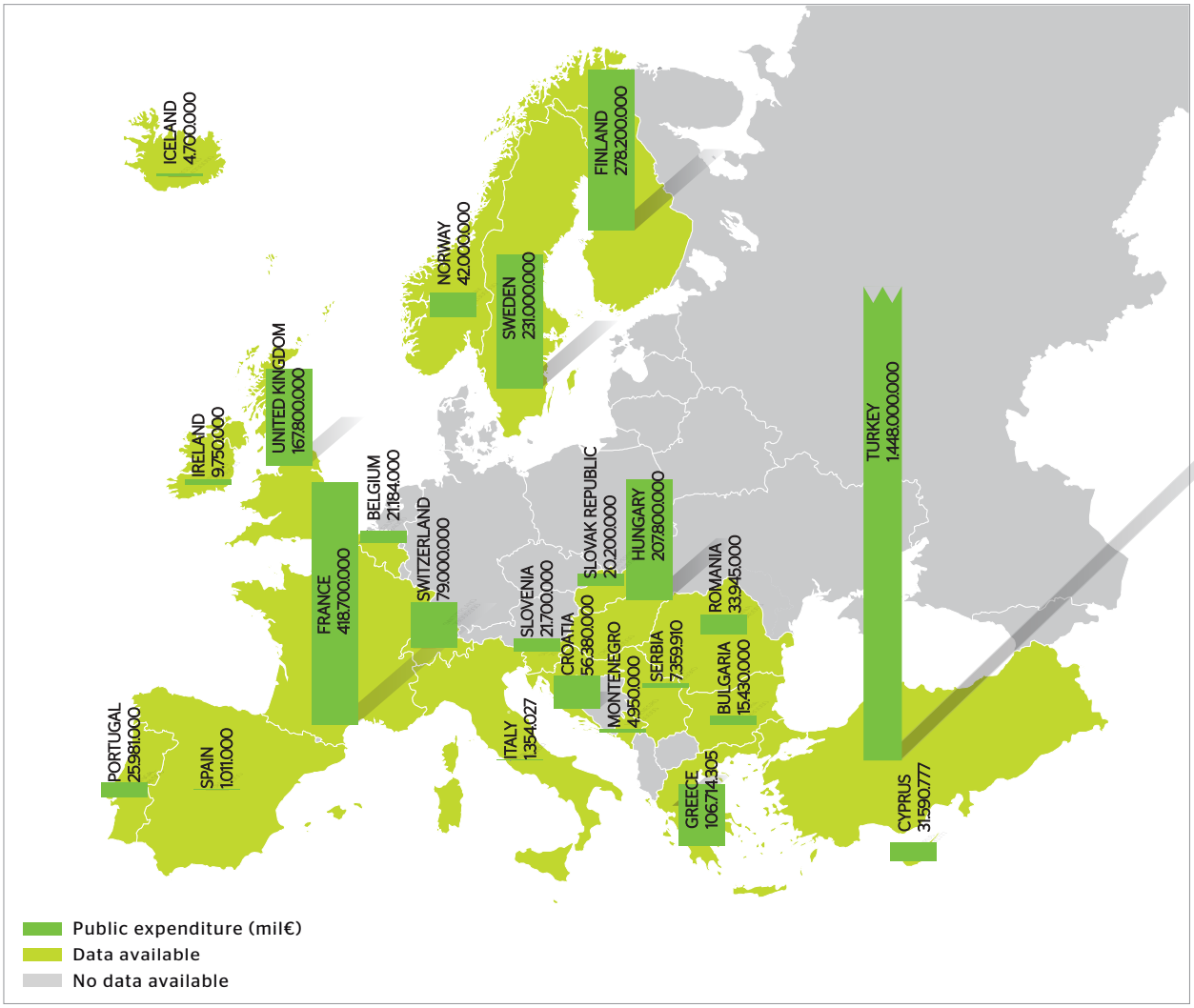

Figure 15. Total public expenditure in EUR in 2013

France

Creation of a new strategic forest fund to improve the management of existing financial resources used for the benefit of forests. Improvement of tax measures for insurance and works. New financial contribution by local authorities to the national forest agency budget.

As in the past, many countries report that they focus on direct supply side support to economic activities, which is often co-financed in EU Member States by support through the EU Rural Development regulation. It should be noted that the new EU Rural Development policy for 2014-2020 has not had any impact on the reporting yet.

Significant changes in financial instruments relating to forests since 2011 only took place in 9 countries and the European Union

Almost one third of the signatories reported changes in financial instruments since 2011. These included the establishment of new financial funds (Bulgaria), the EU CAP reform and related national rural development programmes (European Commission, France, Portugal, Spain), and a decrease in state budgets/financial support for SFM, mainly due to the economic recession (Iceland, Montenegro, Ukraine).

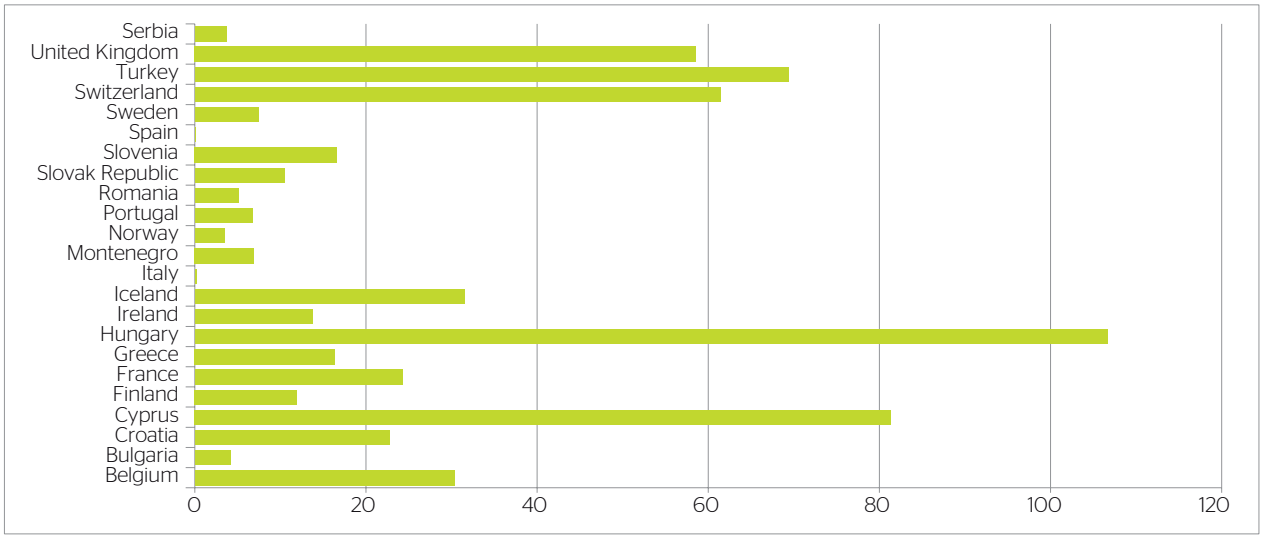

Figure 16. Total public expenditure relating to forest and other wooded land (EUR/year/ha) in 2013

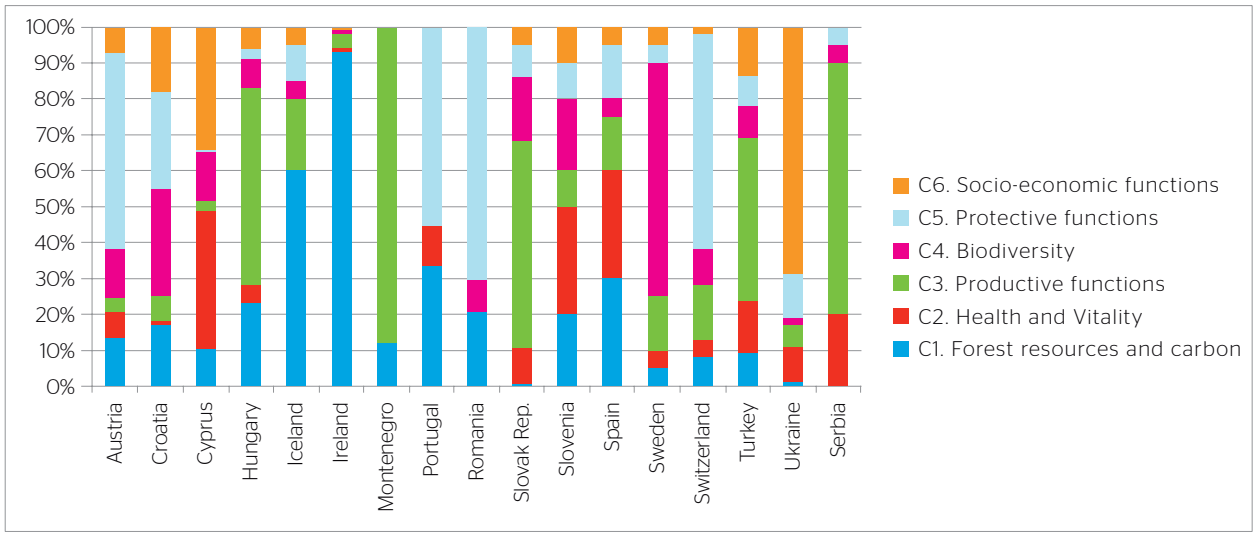

Figure 17. Estimated distribution of total public expenditure across the six criteria for SFM in 2013

Indicator A5 Informational means

Introduction

Informational means encompass a wide range of tools and approaches, such as research and development, education and training, advisory and extension services, public relations and awareness-raising as well as regular monitoring and assessment systems that provide information on the state of forests and the effectiveness and efficiency of sustainable forest management practices. Informational means are essential for informing citizens and the public about forests and for establishing a dialogue on forest-related issues and priorities. They also contribute to increasing the transparency of forest policy-making and to holding forest policy-makers accountable.

Status

31 countries provide public access to forest inventory data

Almost all of the reporting signatories (31 of 34) indicated that there is public access to forest inventory data in their countries. In general, the results of the forest inventories are published on the national websites (Austria, Bulgaria, Croatia, Finland, France, Germany, Hungary, Iceland, Italy, Luxembourg, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom). In a few countries, e.g. Bulgaria, Cyprus and Ukraine, access to data is limited and available on demand. The usual restrictions on detailed data apply, i.e. in some countries plot data are only available on demand and to the owners. Only 2 countries have reported no access to forest inventory data (Greece and Montenegro). The EU reported on the European Forest Data Centre, EUROSTAT, EU Biodiversity Indicators – SEBI etc.

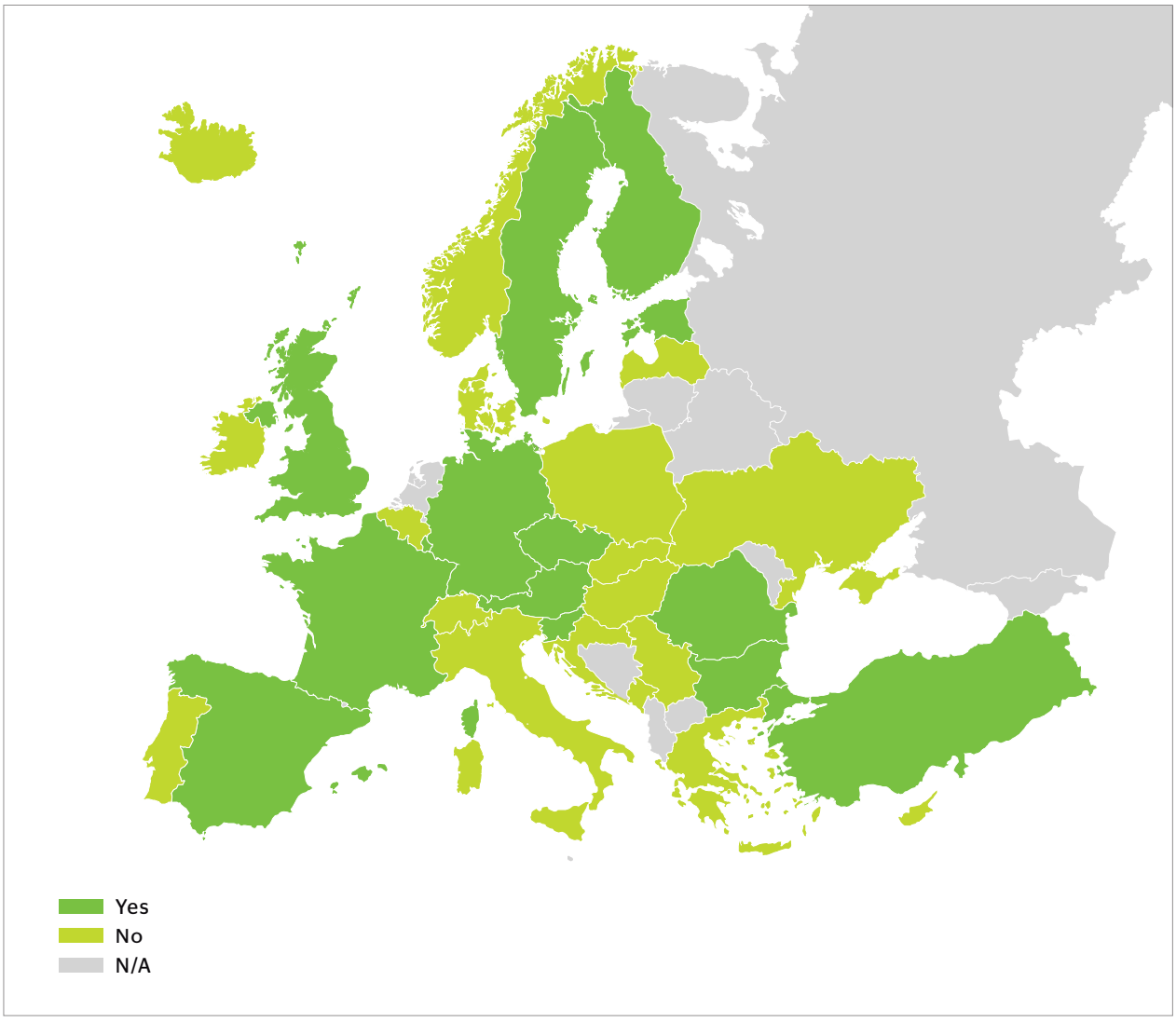

Figure 18. Existence of a formal (governmental) forest-related outreach and communication strategy in 2013

14 countries have a formal governmental forest-related outreach and communication strategy

Nearly half of the signatories (14 out of 34) stated that a formal forest-related outreach and communication strategy exists and is available in many cases on government websites (see Figure 18). In several countries, the communication strategy is part of the NFP (e.g. Finland, Slovenia, Turkey). The EU issued a Forest Communication Strategy (2011), which was developed by the Standing Forestry Committee.

23 countries issue a national report on the status of sustainable forest management

Of the 23 countries that issue a national report on the status of SFM, several issue such reports annually (e.g. Bulgaria, Czech Republic, Estonia, Hungary, Poland, Slovenia, Sweden, Ukraine). 5 countries reported that they base their national reports on the pan-European C&I for SFM (Austria, Finland, France, Germany, Spain).

European Union

Communication is one of the key priorities of the EU Forest Strategy Communication is a particular challenge for the sector, as the public is generally not aware of how significant sustainable forest management is, or of the various ways in which the forest sector contributes to the green economy. During the implementation of the Strategy, further efforts will be pursued, in particular in the framework of the EU Forest Communication Strategy developed by the Standing Forestry Committee. Public perception of forests will be also further assessed, possibly through the Eurobarometer.

Sweden

A number of informational means are used to increase knowledge about how forests contribute to the sustainable development of society. One example is "My pages" (Mina sidor in Swedish), an e-service for forest owners provided by the Forest Agency through which forest owners can access information about the data the authority has about their forest property, incl. maps, satellite images, aerial photos and laser-scanning information. Using this e-service, forest owners can plan the management of their forests and submit harvesting notifications to the forest authority.

Estonia

A number of public web-services has been developed and implemented in recent years to facilitate the multiple and effective use of forests (e-forest notification, public forests register, GIS platform for regional forest officers, e-waybill information system for data transfer between timber trading partners etc).

Many countries place particular emphasis on working with schools so as to reach young people (e.g. Austria, Cyprus, Czech Republic, France, Latvia, The Netherlands, Portugal), run public relations campaigns (Austria, Romania, Ukraine, Switzerland), organize specific events with a view to communicating with a wider interested audience (e.g. Belgium, Czech Republic, Ireland, Latvia, Portugal, United Kingdom), or have specified more integrated communication as key part of their policy processes (Finland, Czech Republic, Austria).

Ukraine

The main goals of the communication strategy are ensuring transparency and openness in the activities of the State Forest Resources Agency of Ukraine and its departments; greater involvement of the general public in decision-making, providing consultations with the public and ensuring public access to reliable information concerning forests and forest management. Another priority remains increasing public confidence in forest management activities. For this reason, all communication means are used, e.g. the annual forestry campaign: "Future forest in your hands", round tables, open house days, press conferences etc.

Austria

Generating coherence in forest-related communication by public and private sector stakeholders at different levels is an important part of the forest communication strategy of the Federal Ministry of Agriculture, Forestry, Environment and Water Management. "Waldzeit", a broad forest communication campaign in the context of rural development policies (www.waldzeit.at), operates the new internet platform www.wald-in-oesterreich.at, which provides easy access to information about the entire forest chain of custody.

Trends and explanations

Social media are used by an increasing number of countries to boost the dissemination of forest information

Nearly half of the signatories (14 out of 34) reported changes in their informational means, primarily through the renewal or boosting of their internet presence and functionalities (reported by 8 countries) and the enhanced use of social media (reported by Austria, Czech Republic, Italy, Sweden, United Kingdom). A range of countries made direct reference to the International Year of Forests in 2011, which provided an impetus for enhanced communication about forests. The two groups mentioned most often as the specific targets of communication were young people (Finland, Hungary) and forest owners (Slovenia).

Part II
European Forests: Status, Trends and Policy Responses

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Criterion 1: Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global Carbon Cycles

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Data resources: Quantitative Indicators: Indicators 1.1, 1.2, 1.3, 1.4 –National reports on Joint FOREST EUROPE/UNECE/FAO Questionnaire on Pan-European Indicators for Sustainable Forest Management

Qualitative Indicators: Indicators B1, B2– National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator 1.1 Forest area

Forest area in Europe currently amounts to 215 million ha and accounts for 33% of the total land area. Other wooded lands cover an additional area of 36 million ha (5.5%). The degree of forest cover varies among countries in Europe. While the most extensive forest cover (53%) is found in North Europe, South-East Europe is the least forested region in Europe (23%).

The distribution by forest type varies considerably by region; 45% of European forests are predominantly coniferous, 36% are predominantly broadleaved and the remainder are mixed. At 94%, Central-West Europe has the highest share of forests available for wood supply while Central-East Europe has the lowest share at 70%.

Forest area in all European regions increased in the periods 1990-2015 and 2005-2015. However, the expansion rate decreased in the last period, particularly in North and South-West Europe. Europe has gained 17.5 million ha of forest area over the last 25 years.

Indicator 1.2 Growing stock

The total stem volume in European forests currently amounts to 35 billion m^3, of which 84% is available for wood supply. The regions with the largest volumes of growing stock available for wood supply are Central-West Europe with 8.8 billion m^3 and Central-East Europe with 7.9 billion m^3. The average density of growing stock in forests in the European region is 163 m^3/ha. Hence, the average density level of growing stock in forests in Europe is higher than that in the world (133 m^3/ha); at 205 m^3/ha, the South America region alone has a higher density level of growing stock in forests than Europe. A little over half of the total growing stock in Europe is made up of coniferous tree species (57%) with broadleaved tree species (43%) making up the remainder.

Over the last 25 years, the total growing stock in forests increased by an average of 403 million m^3 each year. This corresponds approximately to a daily increase in the total stem volume of living trees in European forests equivalent to twice the volume of the Eiffel Tower. The average annual rate of increase was 1.4% between 1990 and 2015, and as the annual rate of forest area expansion was less than 0.4% in the same period, the growing stock density in European forests increased from 126 m^3/ha in 1990 to 163 m^3/ha in 2015.

The annual rate of increase in growing stock remained mostly constant at European level over the observed period from 1990 to 2015, however significant differences can be observed between regions in the dynamics of growing stock accumulation. Compared to the entire 1990-2015 period, the growing stock accumulation rate in South-East Europe and Central-East Europe increased over the last ten-year period 2005-2015; the opposite is true for the other European regions.

Indicator 1.3 Age structure and/or diameter distribution of forest

Around 70% of the forests in Europe are even-aged and 30% are uneven-aged. For the even-aged forests a new classification system was applied, which divides forests into the development classes 'regeneration', 'intermediate', and 'mature' rather than age classes. Around 40% of European forests were reported as even-aged intermediate and around 15% as belonging to both the regeneration and mature categories. It should be noted, however, that the data reported for this indicator are incomplete and very uncertain.

Indicator 1.4 Carbon stock

European forests are major carbon sinks, i.e. they absorb large amounts of CO_2 from the atmosphere. Between 2005 and 2015 the average annual sequestration of carbon in forest biomass reached 719 and 414 million

tones CO_2 in the European region and EU-28 area respectively. This corresponds to around 9 % of the net greenhouse gas emissions for the European countries and EU 28. The carbon stocks of dead organic matter and soil organic carbon also appear to have increased, however these data are rather uncertain.

Indicator B1 Land use and forest area

Forest law is the main policy instrument for guiding and supporting the maintenance and expansion of forest area within the FOREST EUROPE region. The most frequently reported policy objectives in relation to land use and forest area within the FOREST EUROPE countries are: the afforestation of agricultural land unsuitable for agricultural use in countries, in which national laws do not prevent changes in land use; the management of erosion-sensitive mountain areas for protection against natural hazards and, therefore, the enhancement of protective forests; the improvement of the stability, productivity, diversity and naturalness of forests through an integrative forest management approach.

Countries with a low forest cover often report on clearly defined targets for increasing forest area, in most cases by means of government subsidies or EU funding instruments. In contrast, countries with a high forest cover often fail to see the need to expand the existing forest cover.

Many FOREST EUROPE countries reported on changes relating to the legal framework or the reorganization of the structure of legal authorities since 2011. This was mostly due to the economic recession and the associated decline in domestic public financing. This restructuring could influence land use and the expansion of forest area in a wider context in the future (e.g. reduction of substitutes for afforestation/ reforestation measures or of subsidies for short-rotation forestry programmes).

Indicator B2 Carbon balance

The focus of policies on forest carbon and carbon balance has gradually shifted from sequestration capacity to the integrated perspective of sustainable forest management. The emphasis is now on the full chain of sequestration and the production and use of wood for wood products and renewable bioenergy, in particular. Due to the increasing impacts of climate change, the adaptation of forests to the changes in climate conditions and the capacity of forests to mitigate climate change have also become key issues. Most countries have established specialized entities with responsibility for the implementation of regulations, projects and programmes on climate change, renewable energy and energy efficiency. In particular, the associated subsidies are accelerating measures for increasing the use of woody biomass for bioenergy purposes. A total of 33 countries reported on this indicator.

Indicator 1.1 Forest area

Area of forest and other wooded land, classified by broad-leaves and conifers, and by availability for wood supply, and share of forest and other wooded land in total land area.

Introduction

The forest area indicator provides a general overview of European forest resources and is a basic source of information on the overall state of European forests, land-use policies, forest policies and environmental reporting. The extent of forest area and, particularly, changes in forest area are crucial elements for assessing the sustainability of land-use management. Furthermore, the availability of forests for wood supply in Europe is gaining in significance in the context of the multiple demands on forests, e.g. for material and energy uses.

Estimates of forest area and other wooded land area are available for all countries in the European region for the years 1990, 2000, 2005, 2010 and 2015. 6 countries did not report data on Forests Available for Wood Supply (FAWS) for 2015. Moreover, 2 countries were unable to provide a full time series but reported data on FAWS from 2005. Data on other land with tree cover are rather sparse and were only reported by 22 countries. 9 countries, which account for 18.5% of the European forest area, were unable to provide information on forest types %.

Data availability and significant differences between national and international definitions of forests available for wood supply and between different interpretations by the various countries of the international definition in this and previous reports (SoEF 2011, FOREST EUROPE, UNECE and FAO 2011) are the main reasons for the lack of more complete and harmonised national data sets.

Status

Forests cover over 215 million ha in Europe, that is 33% of Europe's land area. Forest area is unequally distributed over the European territory and there are significant differences in the percentage of forest found in different European countries. However, the percentage of forest is between 30 and 45% in nearly half of the countries (Figure 19).

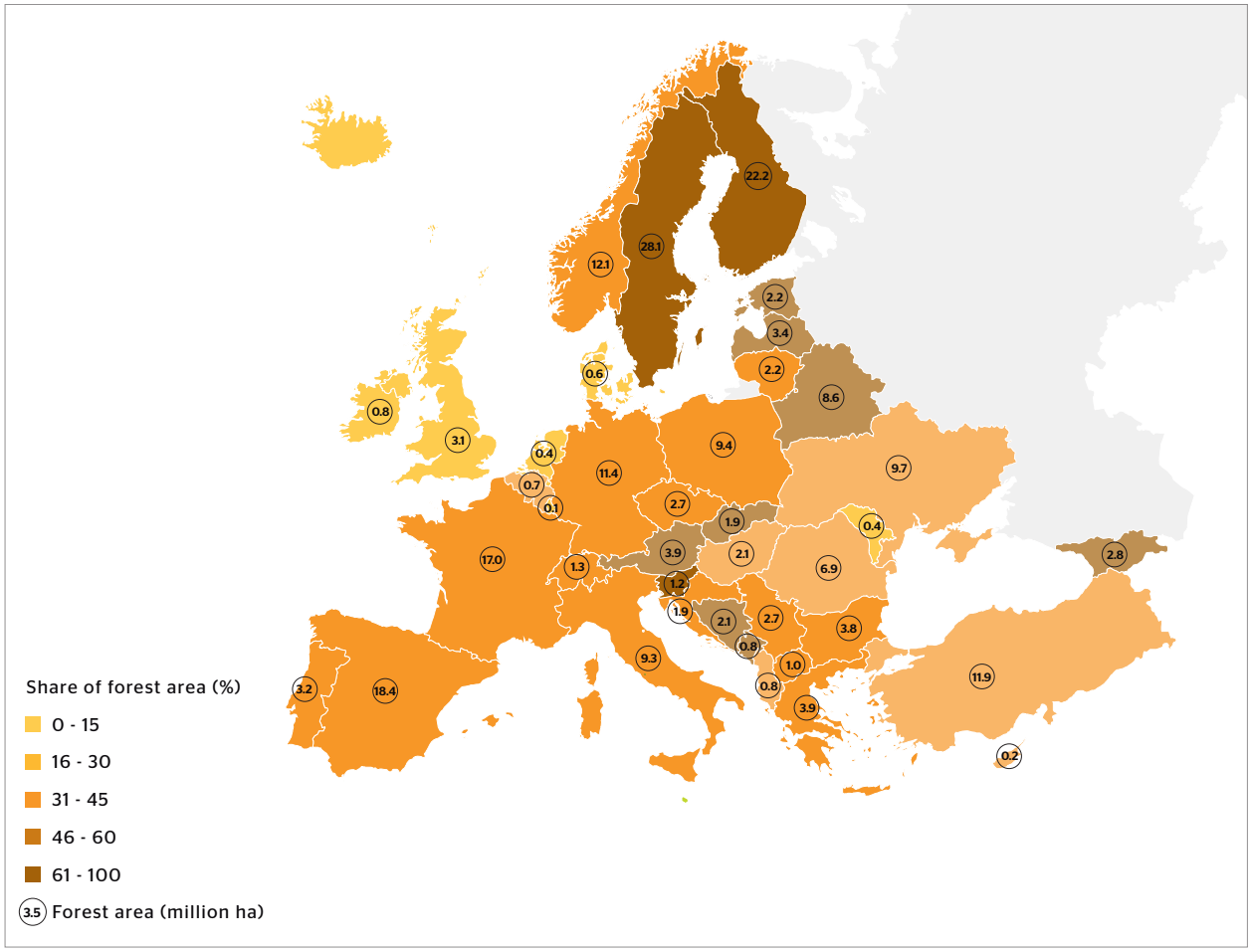

Figure 19. Forest area (million ha) and share (percentage) of land area by country, 2015

Large forest areas are typical for countries in the North Europe region (Table 5). In Finland, almost three quarters of the total land area is covered by forests. At 68%, Sweden is the country with the second largest forest area. Slovenia is the only country in the South Europe region with more than 60% forest cover. The lowest share of forest land occurs in the South-East Europe region (23% of the land area). Between 10 and 15% of the land area is under forest cover in Denmark, Moldova, United Kingdom, the Netherlands and Ireland. The countries with the least forest cover are Malta and Iceland (1.1 and 0.5% respectively).

Other Wooded Land (OWL) represents 36 million ha, a small part of the total land area in all regions except South Europe (Table 1). Indeed, the climate and soil conditions in South Europe favour scattered tree vegetation and shrubland. 5 countries in Central-West and East Europe (Germany, Netherlands, Czech Republic, Poland and Slovak Republic) reported zero values for other wooded land, which explains the very low share of less than 1% OWL in these two European regions.

The forests in Europe are made up of stands dominated by coniferous trees (45%) and broadleaved trees (36%). Mixed stands cover 19% of Europe's forest area (Figure 20). The larger share of stands dominated by coniferous trees is mainly explained by the dominance of coniferous trees in Finland and Sweden (75 and 72% respectively) where boreal forests predominate, while a greater share of broadleaved-dominated stands is found in other parts of Europe.

Higher percentages of predominantly broadleaved stands are mainly located in the Mediterranean countries and in South-West and South-East Europe, which report 62 and 47% of broadleaved stands respectively, and in countries under oceanic influence in Central-West Europe. The higher percentages of mixed forest are located in Central-West Europe and represent 31% of the forests there.

The area of forests in Europe available for wood supply in 2015 amounted to 166 million ha (Table 5). This corresponds to 79% of the forest area of countries reporting on FAWS. Central-East Europe is the region with the lowest share of forests available for wood supply (70% of the reported forest area). These data differ from the results in previous reports, in which the lowest share was reported in the South-East

Table 5. Extent of forest and other wooded land, 2015

Region	Forest....		....of which available for wood supply			other wooded land	
	1 000 ha	% of total land	1 000 ha	Total forest area of countries reporting FAWS 1000 ha	% of forest land	1 000 ha	% of total land
North Europe	70,832	53.2	55,223	70,832	78.0	5,874	4.4
Central-West Europe	38,582	27.6	36,290	38,582	94.1	918	0.7
Central-East Europe	44,494	27.1	31,019	44,085	70.4	914	0.6
South-West Europe	30,913	35.0	25,016	30,897	81.0	12,747	14.4
South-East Europe	30,446	23.5	18,391	24,826	74.1	15,308	11.8
Europe	215,267	32.8	165,939	209,223	79.3	35,760	5.5
EU-28	160,931	37.9	134,486	160,931	83.6	20,987	4.9

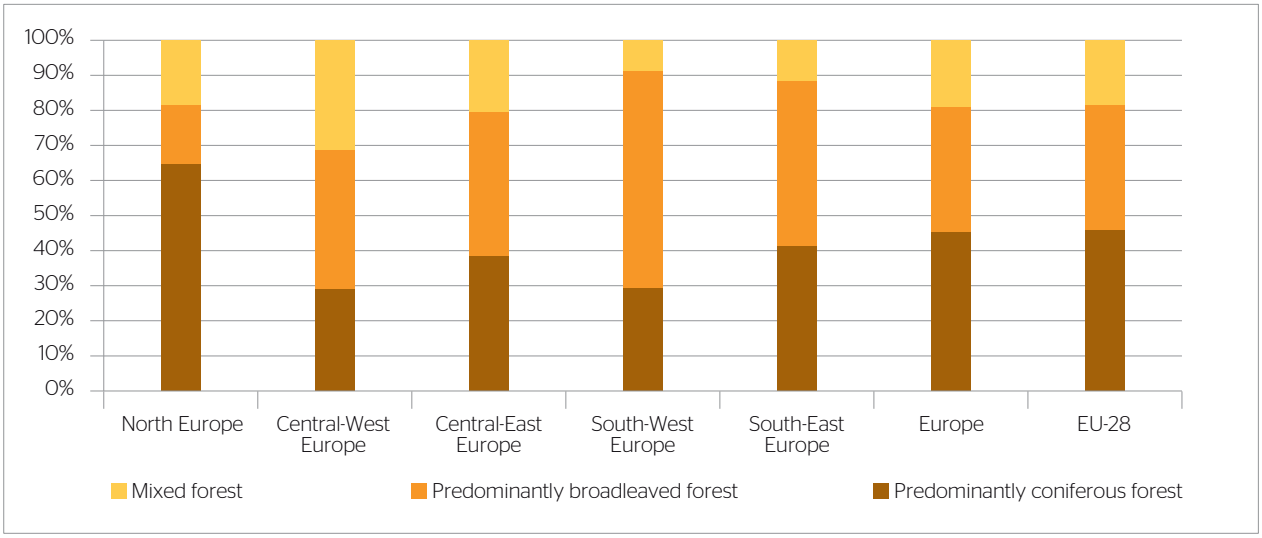

Figure 20. Proportion of forest area by forest type and region, 2010

Europe region. As mentioned above, this may be due to differences in the interpretation of the definition of forest available for wood supply.

South-East Europe and North Europe are also the European regions in which less than 80% (74 and 78%, respectively) of forest area is available for wood supply. In Central-West Europe, the share is the highest at over 90%.

The figures on forest area per inhabitant (Table 6 and Figure 21) are the highest for North Europe (2.2 ha per inhabitant), which also has the lowest population density in rural areas (4.2 inhabitants/km^2). Finland and Sweden report 4.1 and 2.9 ha forest area per inhabitant. Central-West Europe region has the lowest forest area per inhabitant, 0.1 ha of forest area per inhabitant and a rural population density of 37.9 inhabitants/km^2. The United Kingdom, Netherlands and Malta have less than 0.05 ha forest area per inhabitant.

Table 6. Forest area per inhabitant (ha) and population density in rural areas (inhabitants per km^2) by region, 2015

	Forest [ha] per inhabitant	Rural density [inhabitants per km^2]
North Europe	2.2	4.2
Central-West Europe	0.1	37.9
Central-East Europe	0.3	31.5
South-West Europe	0.3	26.0
South-East Europe	0.3	18.6
Europe	1.2	21.4
EU-28	1.3	22.9

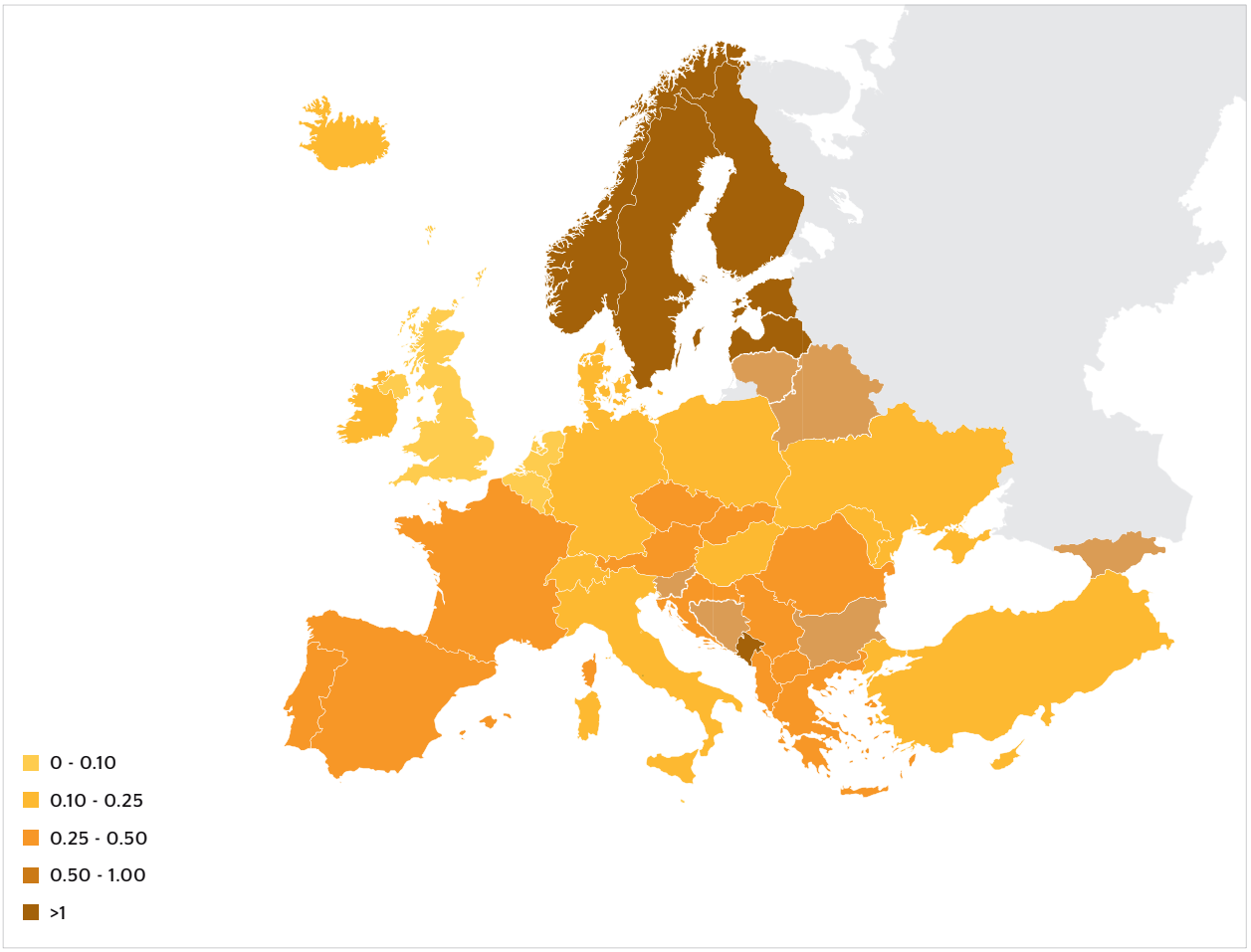

Figure 21. Forest area (ha) per inhabitant and country, 2015

Trends (1990-2015 and 2005-2015)

The forest area in Europe expanded by 17.5 million ha over the last 25 years. On average, Europe's forest area increased by 700,000 ha (0.33%) per year (Figure 22). The presented changes in forest area are net changes and are the results of afforestation, natural forest expansion and deforestation.

On average, all European regions continuously gained forest area over the last 10 and 25 years, although the rate at which European forests are expanding is decreasing (Table 7). With an annual increase of 242,000 ha (0.9%) over the last 25 years, forest expansion was highest in South-West Europe followed by South-East Europe at 166,000 ha (0.6%) and Central-West Europe at 142,000 ha (0.4%) per year.

During the period 1990–2015, the annual increase of forest area in North Europe and South-West Europe was higher than in the period 2005-2015. This indicates that forest expansion has decreased in these regions in recent years, and this is also the cause of the overall decline in the expansion rate at European level. The only regions where forest expansion increased in recent years were South-East Europe and, to a minor extent, Central-East Europe.

Table 7. Annual change in forest area by region (1990-2015 and 2005-2015)

Region	1990	2000	2005	2010	2015	Annual change 1990-2015	Annual change 2005-2015
	1 000 ha						
North Europe	69,975	70,852	70,736	70,781	70,832	34	10
Central-West Europe	35,021	36,385	37,162	37,861	38,582	142	142
Central-East Europe	41,628	42,762	43,300	43,873	44,494	115	119
South-West Europe	24,852	28,705	29,353	30,531	30,913	242	156
South-East Europe	26,297	27,447	28,429	29,562	30,446	166	202
Europe	197,773	206,151	208,980	212,607	215,267	700	629
EU-28	147,956	154,740	156,758	159,236	160,931	519	417

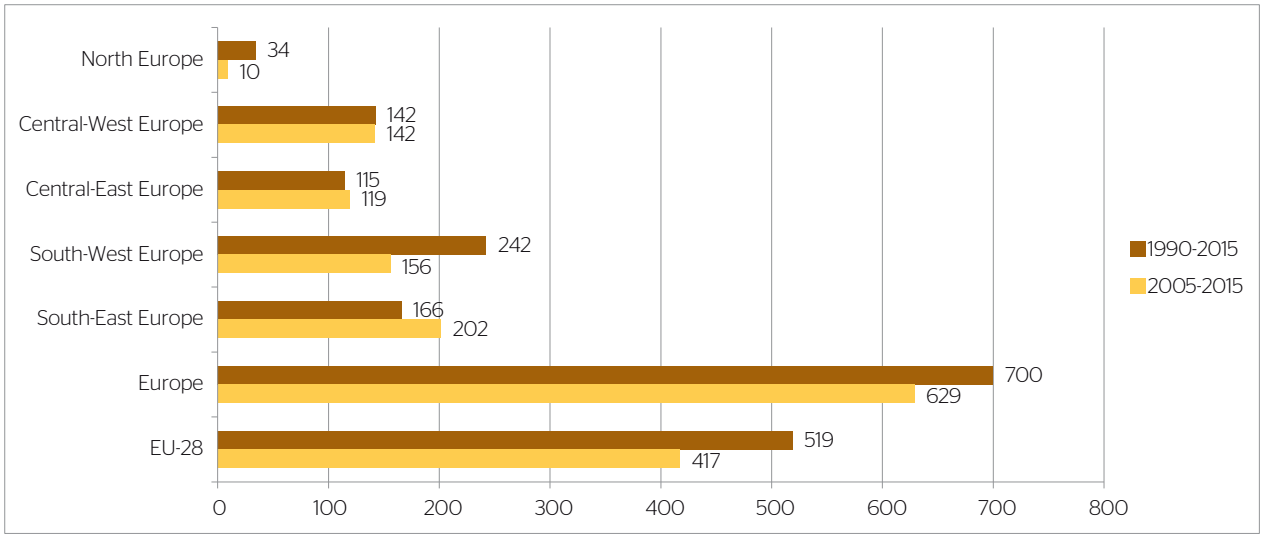

Figure 22. Annual rate of change in forest area by region, 1990-2015 and 2005-2015 (1,000 ha per year)

Total forest area expansion for the period 1990-2015 is highest in Spain at 184,000 ha per year, France at 102,000 ha per year and Turkey at 93,000 ha per year. The annual rate of change expressed as a percentage of the total forest area is highest for Iceland (4.6%), Ireland (2.0%) and Spain (1.2%) for the period 1990-2015 (Figure 23), and for Iceland (3.0%), Montenegro (2.8%) and Moldova (1.2%) for the period 2005-2015. Few countries reported a net decrease in forest area (Portugal, Bosnia and Herzegovina, Albania and Norway) throughout the period 1990-2015, and Sweden reported a decrease for the period 2005-2015.

The limited data available on the share of forest types in Europe did not allow for an analysis of trends.

The trend for forests available for wood supply is contrary to the general increase in forest area. With the exception of Central-West Europe and South-West Europe, the forest area available for wood supply in all European regions decreased during the period 2005 - 2015. The reasons for this trend cannot be found in the data, however differences in the definition used and data availability along the time series could have affected these figures. The disparities in the changes in forest area become more evident at national level.

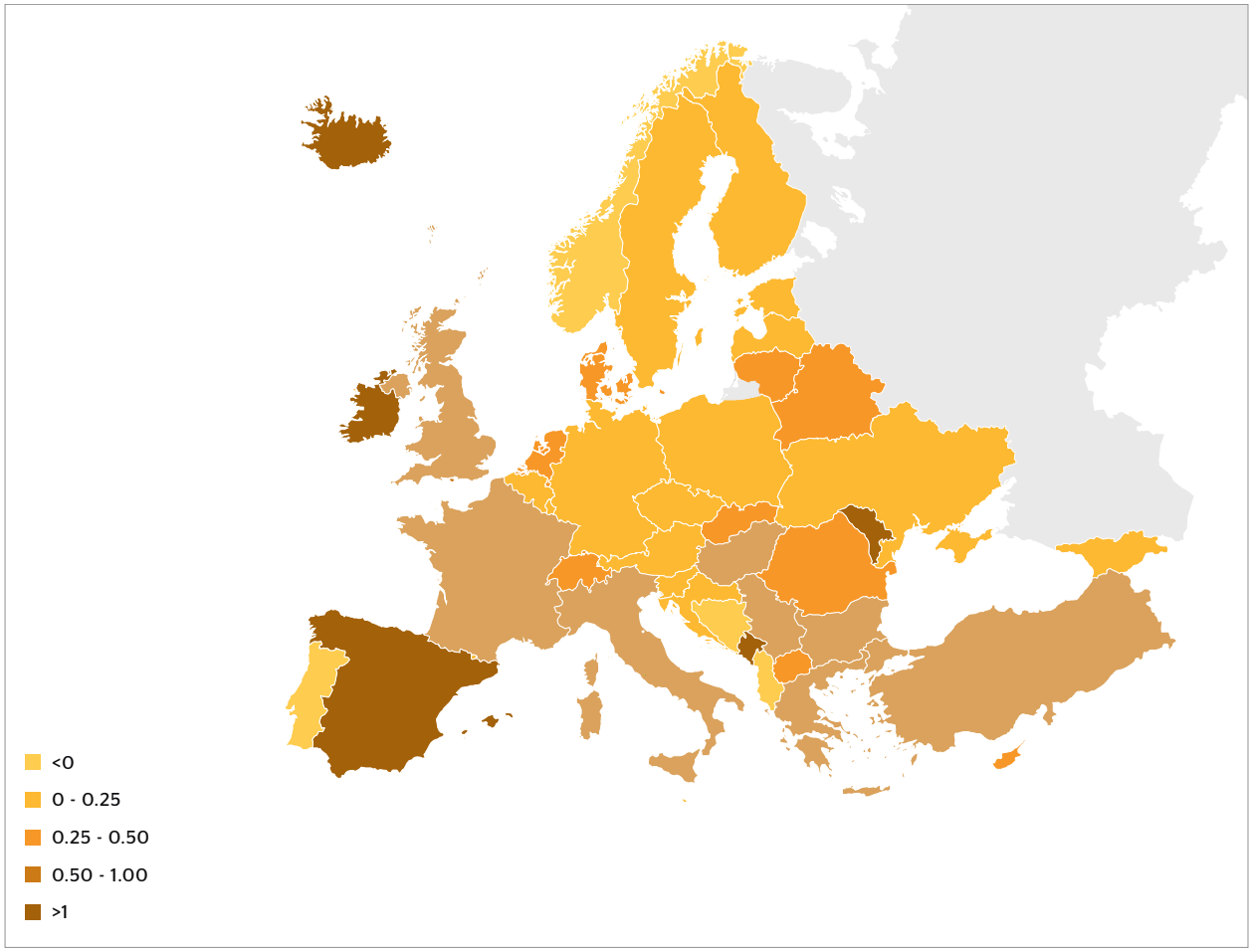

Figure 23. Annual rate of change in forest area by country 1990-2015 (percent)

Indicator 1.2 Growing stock

Growing stock of forest and other wooded land, classified by broadleaves and conifers and by availability for wood supply

Introduction

Growing stock, the stem volume of living trees, is a basic variable in forest inventory. The estimates for total growing stock in forests (m^3) and for the average growing stock density in forests (m^3/ha) by forest type, the availability for wood supply, and the change in these indicators over time provide basic information for the assessment of the sustainability of forest management. Growing stock information is also used as a basis for estimating the amount of carbon accumulated in living trees and allows for the assessment of harvesting possibilities and risks of disturbance.

Figures for growing stock in forests were provided by almost all countries for the years 1990, 2000, 2005, 2010 and 2015; slightly fewer data were available on growing stock in forests available for wood supply, especially in the Central-West and Central-East Europe regions. 15 (of 42) countries did not provide an estimate of growing stock on other wooded land for the most recent year, 2015, and only 16 countries provided a full time series of growing stock estimates on other wooded land from 1990 to 2015. All countries with data available for the year 2015 provided figures on growing stock composition by coniferous and broadleaved tree species.

Status

The total growing stock of European forests amounts to 35.1 billion m^3, of which 29.5 billion m^3 is located in forests available for wood supply (Table 8). Of the 29.5 billion m^3 of growing stock in forests available for wood supply, 30% is located in the Central-West Europe region, 27% in the Central-East Europe region and 24% in the North Europe region.

The reported total growing stock on other wooded land amounts to 198 million m^3, with 139 million m^3 in the South-East Europe region, 36 million m^3 in the North Europe region and 21 million m^3 in the Central-East Europe region. When interpreting the data for growing stock on other wooded land, it is important to keep definitions in mind. Growing stock refers only to the (stem) volume of trees; the volume of shrubs is excluded. On the other hand, the definition of other wooded land includes various types of stockings, including shrubs. Together with a relatively high percentage of unavailable growing stock data for the other wooded land category (due to high measurement costs and low information demand at national levels), these definitions lead to lower amounts of growing stock on other wooded land than may be expected from the actual area of land classified as other wooded land.

The average growing stock density in European forests is 163 m^3/ha. The highest values arise in the Central-West Europe region with 238 m^3/ha and in the Central-East Europe region with 247 m^3/ha, followed by the South-East Europe region with 142 m^3/ha (Figure 24). The variation between countries is high: Switzerland with 353 m^3/ha, Slovenia with 346 m^3/ha and Germany with 321 m^3/ha report the highest growing stock densities, and Iceland with 10 m^3/ha, Greece with 47 m^3/ha and Cyprus with 64 m^3/ha report the lowest. High growing stock densities can be explained mainly by ecological conditions that favour tree growth, by forest protection measures, by management practices and, locally, by terrain conditions that hinder harvesting possibilities.

Table 8. Total growing stock of forest and other wooded land by region, 2015

Region	Growing stock (million m^3)		
	Forest...	...of which available for wood supply	Other wooded land
North Europe	8,247	7,089	36
Central-West Europe	9,185	8,768	1
Central-East Europe	10,541	7,860	21
South-West Europe	2,783	2,370	2
South-East Europe	4,309	3,446	139
Europe	35,065	29,541	198
EU-28	26,526	23,147	42

Coniferous tree species account for 57% of the European growing stock in forests, that is 20.0 billion m^3. The growing stock of broadleaved tree species amounts to 15.0 billion m^3. The stem volume of living trees in European forests is evenly distributed between broadleaved and coniferous tree species in almost all regions with the exception of the North Europe region where around 75% of growing stock is coniferous (Figure 24).

Of the total growing stock in European forests, 84% is located in forests available for wood supply. The highest percentages are reported for the Central-West Europe region with 86% and the South-West Europe region with 85%. In the Central-East Europe region, only 75% of total growing stock in forests is available for wood supply; particularly low percentages are reported for Georgia (21%), Ukraine (65%) and Romania (67%). The noticeable differences between countries are also explained by the currently wide margin of interpretation available to countries in defining the extent of their forests available for wood supply.

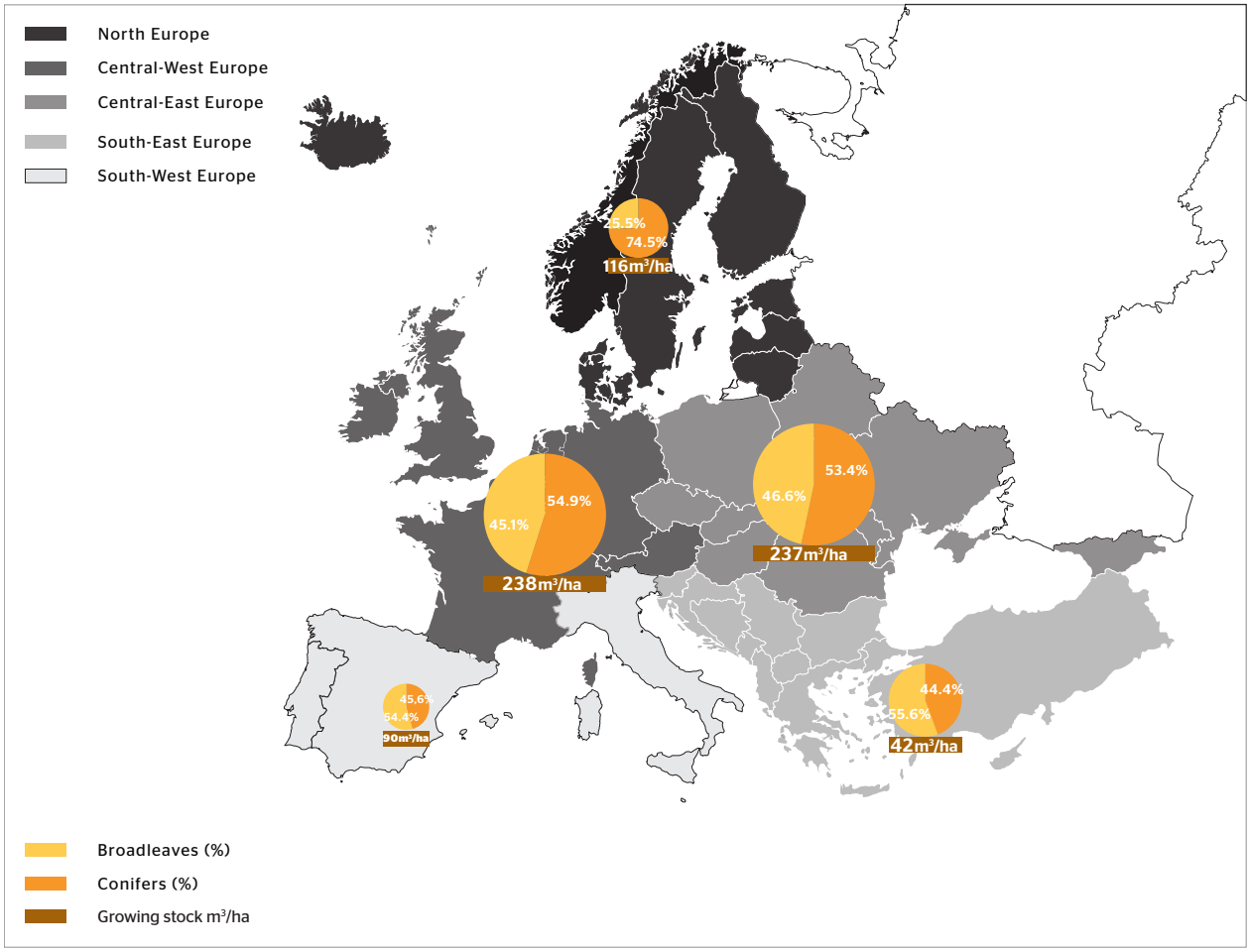

Figure 24. Growing stock in forest subdivided into conifers and broadleaves, by region, 2015 (m^3/ha)

Trends

Over the last 25 years, growing stock in European forests increased by 10.1 billion m^3. Thus, the growing stock increased each year by an average of 403 million m^3 over this period. This corresponds to an annual rate of change of 1.44% (Table 9).

The total growing stock in forests increased in all regions of Europe. The only countries reporting a negative trend are Albania, with an average annual loss of 1.5% between 1990 and 2015, and Georgia, with an average loss of 1.3% between 2005 and 2015.

In absolute terms, the increase in total growing stock was highest in the Central-East region of Europe, where it amounted to 3.5 billion m^3 over the last 25 years, followed by the Central-West Europe region, with an absolute increase of 2.3 billion m^3 and the North Europe region with an increase of 1.8 billion m^3. Over the same period, i.e. 1990-2015, the rate of growing stock accumulation was highest in the South-West Europe region, with an average rate of increase in the growing stock in forests of 1.9% each year, and in the Central-East and South-East Europe regions, with an average rate of increase in growing stock in forests of 1.6%. The increase in growing stock may be partly due to the introduction of new sampling-based inventory systems, particularly in several countries in the East Europe region, and to the expansion of the forest area in most regions. However, the increase in growing stock in forests was higher than the expansion of forest area during the period 1990 to 2015, which gives a higher growing stock density in all European regions (Figure 25).

The growing stock accumulation in European forests over the last 25 years is the product of the difference between the total amount of stem wood volume that was produced (grown) in forests (and gained through forest area expansion) and the total amount of stem wood volume that was removed from forests during this period, either through direct human activities, such as harvesting of wood and the thinning of forest stands, or through losses of living stems caused by wind-throw, insect diseases, landslides and other natural events.

Table 9. Annual change in total growing stock in forests by region, 1990-2015

Region	Total growing stock in forest (million m^3)					Annual change of growing stock 1990-2015		Annual change of growing stock 2005-2015	
	1990	2000	2005	2010	2015	million of m^3	%	million of m^3	%
North Europe	6,486	7,225	7,660	8,029	8,247	70.5	0.97	58.7	0.74
Central-West Europe	6,847	7,910	8,411	8,794	9,185	93.5	1.18	77.4	0.88
Central-East Europe	7,021	8,281	8,772	9,577	10,541	140.8	1.64	176.9	1.85
South-West Europe	1,722	2,172	2,386	2,585	2,783	42.4	1.94	39.6	1.55
South-East Europe	2,923	3,364	3,609	4,054	4,309	55.4	1.56	70.0	1.79
Europe	24,999	28,952	30,838	33,039	35,065	402.7	1.36	422.7	1.29
EU-28	19,169	21,956	23,420	24,935	26,526	284.3	1.31	310.6	1.25

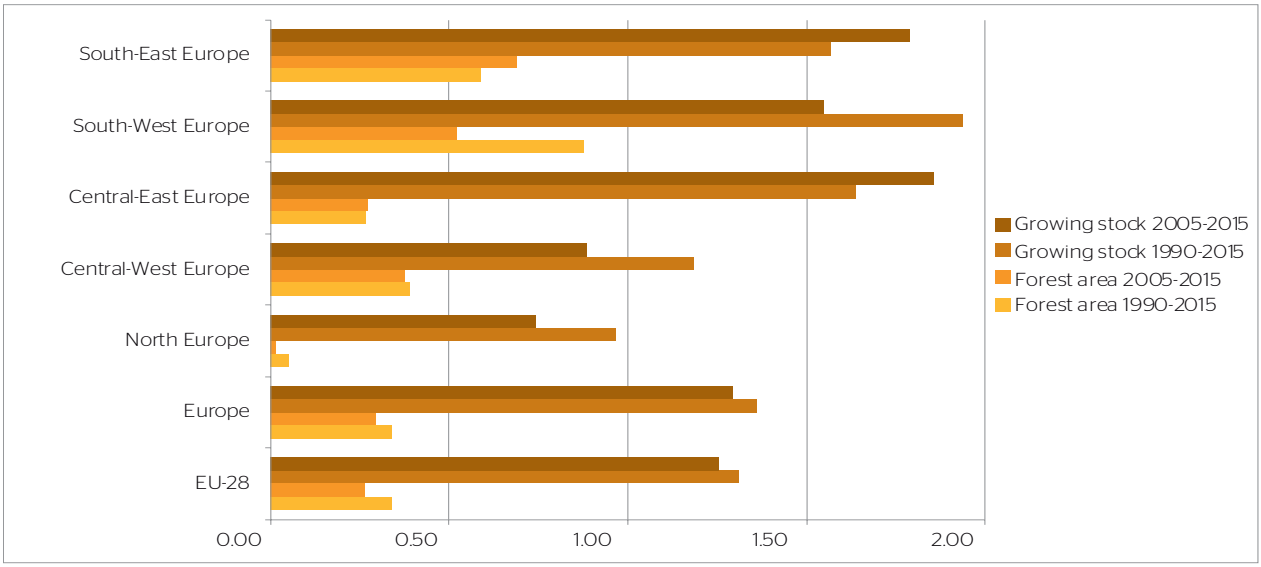

Figure 25. Rates of annual change in total growing stock in forests and forest area by region, 1990-2015 and 2005-2015 in percent

The reasons for growing stock accumulation in European forests are manifold and complex, and the causes and effects vary in importance in the different European regions. The combined effects of CO_2 concentration and N deposition may lead to increased growth rates, which, however, are also an effect of the constantly increasing stocks. On the other hand, low levels of harvesting activity (compared to growth) may be the result of market conditions, increased societal awareness of the multi-functional role of forests, and the more effective management of forests aimed at the optimal and sustainable development of the goods and services provided by the forest ecosystems.

At European level, the rate of growing stock accumulation in forests was mostly stable over the entire 25 year period 1990-2015, however significant differences in the growing stock accumulation dynamics can be observed by region. In the South-East Europe region, growing stock accumulation in forests accelerated from a rate of 1.6% per year during the 25 year period 1990-2015 (corresponding to an average increase of 55 million m^3 each year) to an average rate of 1.8% during the last ten-year period 2005-2015 (77 million m^3 each year). Moreover, and more importantly in absolute terms, the rate of growing stock accumulation in forests in the Central-East Europe region increased from 1.6% during the 1990-2015 period (141 million m^3 each year) to 1.9% during the 2005-2015 period (177 million m^3 each year) (Table 9). The comparison of the rate of growing stock accumulation over the last five years (2010-2015) with that for the previous five-year period (2005-2010) reveals that the Central-East Europe region was the only region in Europe with a higher rate of growing stock accumulation in the recent 2010-2015 period (1.94%) compared to the 2005-2010 period (1.77%). In all other regions of Europe, the rate of growing stock accumulation for the last five-year period 2010-2015 was lower than in the previous five-year period 2005-2010: the growing stock accumulation rate decreased from 2.35% per year to 1.23% in the South-East Europe region, from 0.95% to 0.54% in the North Europe region, from 1.61% to 1.48% in the South-East Europe region and from 0.89% to 0.87% in the Central-West Europe region (Figure 26).

The analysis of the dynamics of growing stock accumulation by coniferous and broadleaved tree species between 1990 and 2015 reveals that the growing stock of broadleaved trees accumulated at a higher rate than that of coniferous trees (1.6% and 1.2% each year respectively). During the most recent five-year period, the growing stock rate of broadleaved trees slowed down slightly from 1.7% per year in the 1990-2000 period to 1.6% during the 2010-2015 period; the decrease in the growing stock accumulation rate was more noticeable for coniferous trees and fell from 1.3% per year during the 1990-2000 period to 0.9% during the 2010-2015 period.

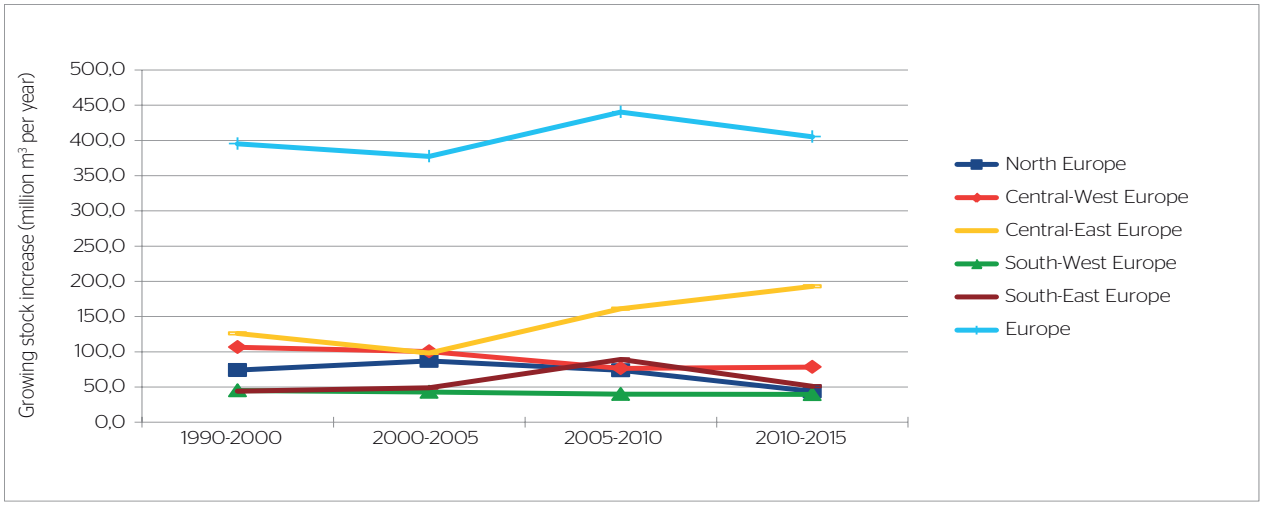

Figure 26. Annual increase in growing stock (million m^3 per year) by region, 1990-2015

Indicator 1.3 Age structure and/or diameter distribution of forest

Age structure and/or diameter distribution of forest and other wooded land, classified by forest type and by availability for wood supply

Introduction

This indicator concerns the age-class structure of forests and, for uneven-aged forests, their diameter distributions. This information is important for understanding the history of forests and their likely future development. From a traditional forest management point of view it facilitates the general assessment of harvesting potential. It also provides insights into the provision of other ecosystem services, such as biodiversity and recreation, which are generally more favourable in uneven-aged and old even-aged forests than in young even-aged forests.

When assessing this indicator, it needs to be pointed out that the results are very uncertain due to a lack of data from a large number of countries (data from 21 countries were missing either completely or inpart). This is especially the case for Central-West, South-East, and South-West Europe. Moreover, the interpretation of definitions may vary between countries.

In previous SoEF reports, even-aged forests were reported by age classes. This has now been changed, and the age classes have been substituted in the current report with the development phase categories regeneration, intermediate, mature and unspecified. The regeneration phase roughly comprises forests between 0 and 20% of the recommended rotation age, the intermediate category between 20% and 90%, and the mature phase comprises forests older than 90% of the recommended rotation age. It should be noted that this is a relative system, hence the actual ages in the different categories vary between countries.

Data are available from 2010 only.

Status

The composition of European forests in 2010 is shown in Figure 27. Overall, even-aged forests dominate. For Europe as a whole, slightly less than 70% of forests are reported as even-aged: the intermediate development phase dominates in the even-aged forests while the mature phase only amounts to around 13%. Uneven-aged forests appear to be fairly common in all parts of Europe and represent the main forest type in South-West Europe (>70%).

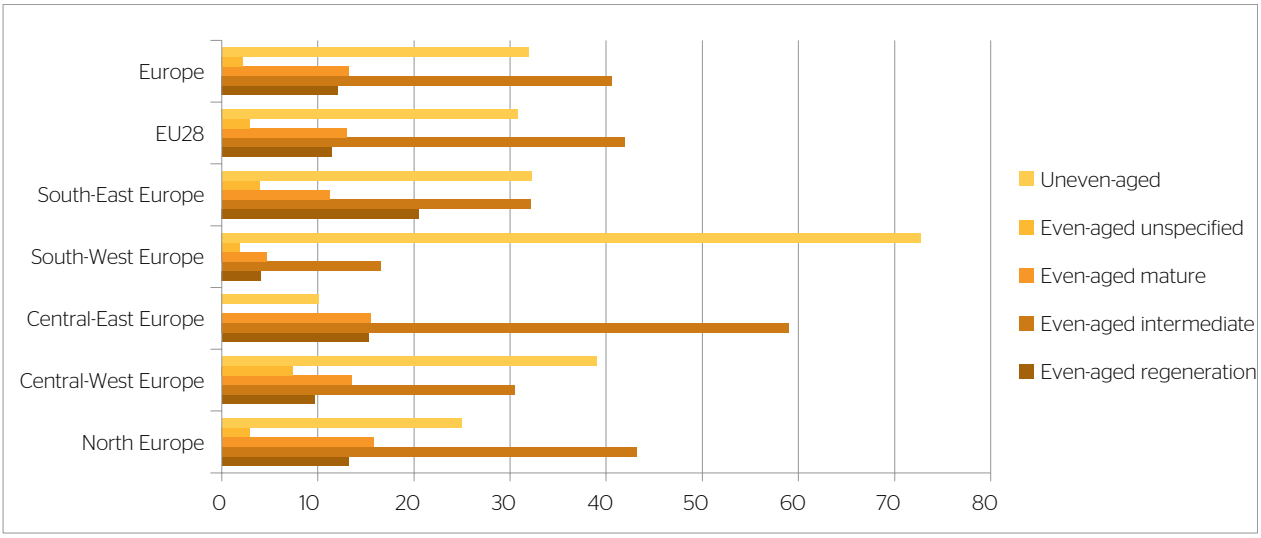

Figure 27. The composition of European forests in 2010 in terms of percentages of uneven-aged and even-aged forest; the latter category is subdivided on the basis of the development categories regeneration, intermediate, mature and unspecified

Indicator 1.4 Carbon stock

Carbon stock of woody biomass and soil in forest another wooded land

Introduction

This indicator is linked to society's efforts to mitigate climate change by reducing the net emissions of greenhouse gases to the atmosphere. Carbon is sequestered in biomass through tree growth. As a result, forests contain large stocks of carbon in biomass, dead organic matter and soil, which can either increase or decrease depending on forest management practices. By assessing the trends in forest carbon stocks, it is possible to ascertain whether forests are carbon dioxide sources or sinks and to what extent forests compensate for greenhouse gas emissions in other sectors. Under the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol, parties are obliged to submit annual reports on greenhouse gas emissions and removals through different land-use categories and carbon pools. In this context, forest land is an important land-use category in many European countries. While this indicator focuses on the carbon stocks within forests, it should be pointed out that forests and forestry may also help to reduce greenhouse gas emissions in other ways. For example, fossil fuel consumption can be reduced through the use of wood-based biofuels. Furthermore, the wood in harvested wood products (HWP) acts as a carbon sink by replacing more energy-consuming materials in various industrial sectors and by storing carbon in structures with a long lifespan, such as timber buildings. From 2013, the reporting of the carbon balance associated with HWP became mandatory under the UNFCCC. However, Indicator 1.4 only addresses the carbon stocks within forests. In the reporting under the Kyoto Protocol, a distinction is made between biomass (above- and below-ground), dead organic matter (deadwood and litter) and soil (mineral and organic). However, specific analyses are only carried out for the biomass pool as it may change markedly over short periods of time in response to growth and harvests. Changes in the other pools tend to be slower and the data are incomplete or poorer in quality.

Status

Table 10 presents the biomass carbon stocks in different European regions. The proportion of the total biomass carbon stock in the individual European regions ranges from around 10 to 27%. In total, the forest biomass carbon stock within European countries amounts to around 4.5% of the world's forest biomass carbon stocks (FAO, 2010). An analysis was carried out to assess the relative share of different forest carbon pools (i.e. above- and below-ground biomass, deadwood, litter, and soil organic carbon) based on data from the countries that reported all five pools. The results are shown in Figure 28. Relative to biomass and soil the other pools are small.

Table 10. Carbon stocks in biomass separated to below- and above-ground components for different European regions in 2015*

Region	Above-ground biomass		Below-ground biomass		Total biomass	
	Mt C	%	Mt C	%	Mt C	%
North Europe	2,324	17.9%	705	5.4%	3,029	23.4%
Central-West Europe	2,823	21.8%	673	5.2%	3,496	27.0%
Central-East Europe	2,623	20.2%	549	4.2%	3,172	24.5%
South-West Europe	1,054	8.1%	299	2.3%	1,353	10.4%
South-East Europe	1,511	11.7%	400	3.1%	1,911	14.7%
Europe	10,336	79.7%	2,626	20.3%	12,961	100.0%
EU-28	7,948	61.3%	2,030	15.7%	9,977	77.0%

* Data from 2010 for Ireland and Portugal

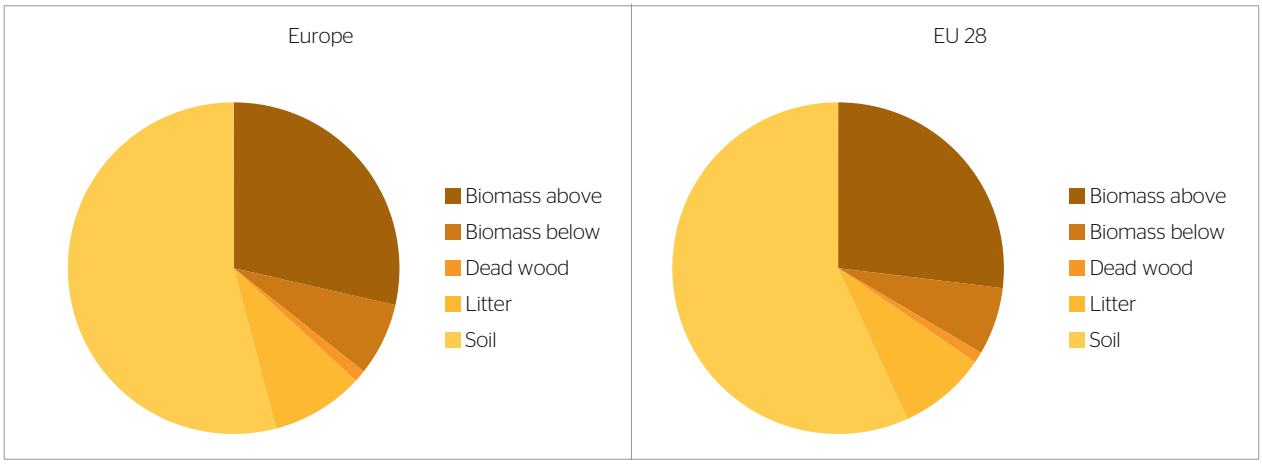

Figure 28. Proportion of the five forest carbon pools in all European countries (left) and in the EU28 (right) (based on data from countries that reported on all five carbon pools), 2015

Trends 1990-2015

The biomass carbon stocks in European forests from 1990 to 2015 are presented in Table 11 and Figure 29 using only data from the countries that reported for all years. The carbon stocks in biomass increased steadily in all regions from 1990 to 2015. Although there are signs of a decline in the rate of increase in carbon biomass accumulation in some European regions (North and South-West Europe), the overall increase in biomass carbon stocks between 2005 and 2015 remains substantial. For the European countries it amounts to 167 Mt C per year or 613 Mt CO_2 for the period 2005-2015. For the EU-28, the corresponding figures are 113 Mt C or 414 Mt CO_2 per year, which amounts to around 8.5% of the gross greenhouse gas emissions during the same period.

The major reason for the observed changes is that growth exceeded cuttings and other removals and the loss of biomass. However, in some regions the growing stock levels have become very high. Hence, in the longer run, forests could maintain or temporarily increase their carbon sink capacity primarily through the increased use of wood-based products, specifically those with a long lifespan. Due to missing data and other uncertainties, no data are presented for changes in the non-biomass carbon pools. However, the available data appear to suggest that these pools are also increasing, albeit not as markedly as the biomass pool. Notwithstanding these uncertainties, the European forests remain a fundamental agent from a climate change mitigation perspective and this enhances the range of benefits offered by forests.

Table 11. Trends in total biomass carbon stocks by region, 1990-2015, and annual change expressed for the period 1990-2015 and last decade. Only the country data reported for the entire reporting period are included here

Region	Carbon stock in biomass					Annual change			
	1990	2000	2005	2010	2015*	1990-2015		2005-2015	
	Mt C					Mt C	%	Mt C	%
North Europe	2,414	2,680	2,829	2,950	3,029	24.6	1.0%	20.0	0.7%
Central-West Europe	2,519	2,871	3,068	3,225	3,447	37.2	1.5%	38.0	1.2%
Central-East Europe	1,917	2,236	2,376	2,622	2,960	41.7	2.2%	58.4	2.5%
South-West Europe	725	950	1,063	1,157	1,251	21.0	2.9%	18:8	1.8%
South-East Europe	1,265	1,442	1,535	1,736	1,854	23.6	1.9%	31.9	2.1%
Europe	8,840	10,178	10,870	11,691	12,541	148	1.7%	167	1.5%
EU28*	6,977	7,998	8,559	9,128	9,826	114	1:6%	127	1.5%

* Data for Ireland and Portugal not included

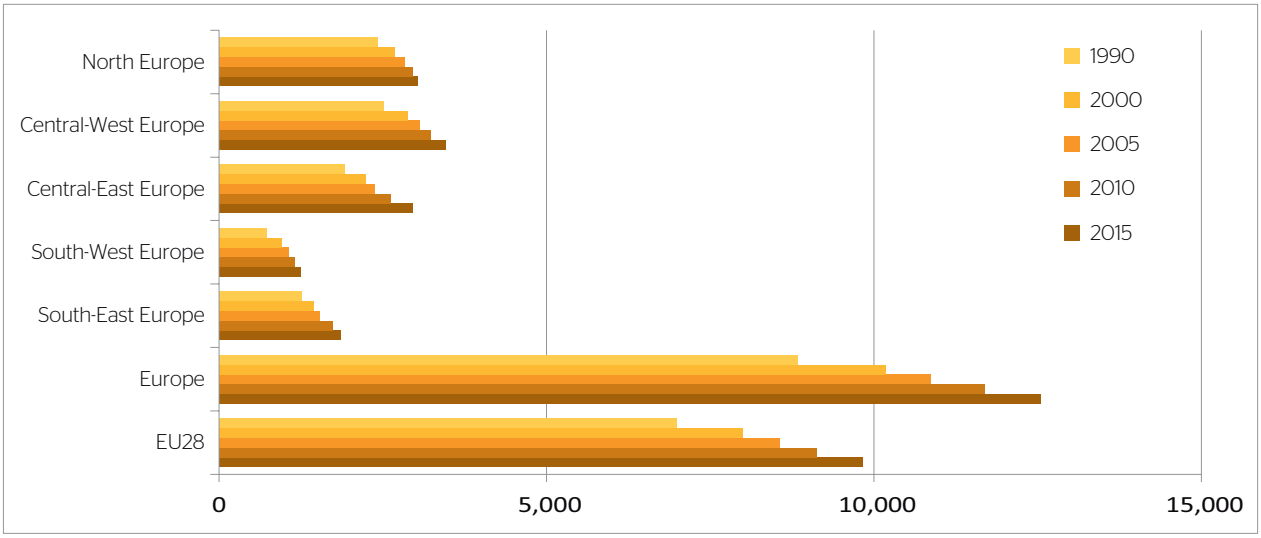

Figure 29. Forest biomass carbon pool from 1990 to 2015 in different European regions (million tonns C)

Indicator B1 Land use and forest area

Policy continuity since the last reporting period and no major developments in relation to the implemented instruments

Status, trends and main changes in policy objectives since SoEF 2011

Most countries have specific objectives in relation to land use and forest area

The majority of the reporting countries (23 out of 34) specifically reported on general policy objectives in relation to land use and forest area. Most of the reported objectives focused on the following topics: the afforestation of agricultural land unsuitable for agricultural use in countries where national laws do not prohibit changes in land use; natural hazard management in erosion-sensitive mountain areas and accordingly the enhancement of protective forests; the improvement of the stability, productivity, diversity and naturalness of forests through an integrative multi-functional forest management approach. Countries with low forest cover often report on clearly defined targets for increasing their forest area. In contrast, countries with high forest cover (Finland and Sweden) often fail to see the need to expand their existing forest cover. More specific targets on increasing the forest area of a country with precise thresholds and timeframes were mentioned by 9 countries (see Table 12).

A quarter of the countries (9 out of 34) reported changes in main policy objectives since 2011. The changes were mainly focused on restoration activities, the maintenance of forest shelter belts, the plantation of new anti-erosion stands and afforestation of non-forested lands (Bulgaria), the enactment of a law on the demarcation of forest and agricultural land (Croatia), and the establishment of monitoring systems for forest area (Romania), especially for the monitoring of the SFM principles in newly established forest areas (Spain). In addition, one country reported on new recommendations that aim to achieve increased forest cover at a slower rate; this development reflects the reduction in new forest planting in recent years (Denmark).

Key measures taken in relation to policy implementation since 2011 were reported by 18 countries and included, e.g., a list of actions and indicators for monitoring National Forest Programme objectives, including the further development of National Forest Inventories. Other measures included the adoption of new or amended national forest laws, acts, strategies, regional development programmes, and forest-related regulations. One country reported on the provision of grants and annual premiums to promote and

Table 12. Specific targets on increasing forest area

Country	Future targets	Forest as a percentage of the land area in 2015
Denmark	Attainment of forest cover of 18% by 2046.	14.4%
Hungary	Permanent increase in forest area, first, through afforestation, the long term goal of which is to achieve forest cover of 25–27%. Based on this objective, a first measure involves the introduction of agro-forestry systems on 3,000 hectares. Reduction of the area of unmanaged forest land.	22.2%
Ireland	Increasing of forest landscapes by between 20–25% within 80–100 years.	10.9%
Poland	Increasing of forest cover to 33% after 2050.	30.8%
Romania	Initial afforestation of 50,000 ha of agricultural and non-agricultural land.	29.8%
Serbia	Increasing of forest area by 5,000 ha/year.	31.1%
Spain	Increasing of forest area by 4 million ha by 2032.	36.9%
Turkey	Increasing of proportion of forest and other wooded land to 30% of total land area by 2023.	15.5% (FOWL 28.4%)
UK	England - increasing of woodland area from 10% to 12% by 2060. Scotland - increasing of woodland area from 17% to 25% by 2050. Wales - creation of 100,000 ha of new forest by 2030. Northern Ireland - increasing of forest area from 6% to 12% by 2056	UK total 13%

increase the national forest area and to encourage the sustainable management of existing forests (Denmark). Key lessons learnt since 2011 were reported by some countries (see Table 13).

Institutional frameworks

A few signatories implemented reorganization measures with a view to increasing efficiency or adopting a broader approach

8 countries reported on the reorganisation of the organisational structure of legal authorities since 2011, in most cases due to the economic recession and the associated decrease in domestic public financing. These reorganisations measures included the merging of bodies/services with competencies in the area of forest/natural resources/rural development/agriculture (France, Montenegro, Poland, Portugal, Spain, UK-Wales) and reorganisation measures within ministries (e.g. the establishment of new departments) and state forest agencies/other bodies with a view to improving efficiency (Latvia, Romania, Slovak Republic), and the highlighting of a broader and more holistic approach to natural resource management (Finland and Spain). The reorganisations of the structure of legal authorities also resulted frequently in a reduction in the workforce. However, it is interesting to note that 1 country reported an increase in the workforce with a view to improving efficiency in public forest management (Slovenia).

Legal/regulatory framework and international commitments

National forest acts, codes, laws, regulations and national forest programmes constitute the main legal basis for regulating land use and forest area

Since the last reporting period in 2011, around 19 countries reported on amendments to forest laws and acts, e.g. in relation to construction rights/utilization rights (Bulgaria, Croatia, Turkey), specific provisions on the protection of forest land (Cyprus), reforestation/afforestation measures (Greece, Latvia), forest ownership (Finland, Norway, Slovenia), biodiversity, forest regeneration/tree species, environmental provisions (Finland, Norway), and a change in the definition of "Forest and other wooded land" (Montenegro). Table 14 presents examples of significant changes in legal/regulatory frameworks for 2 countries since 2011.

Table 13. Examples of key lessons learnt on implementing policies relating to forest area

Country	Key lessons learnt
Bulgaria	"The adoption of a new Law on forests determined the division of functions between Ministry of Agriculture and Food and the Executive Forest Agency. The state forest administration - EFA performs control functions and the 6 State Forest Enterprises according to art. 163 of the LF implement the management activities in the forest territories that are state owned."
France	"Specialised local commissions are in charge of following up on agricultural spaces consumption. Their mandate has been extended to forest spaces consumption (Forest act, October 2014)."
Hungary	"Continuous increase of the forest area slowed down from 10 000 hectares/ year to 3 000 hectares/ year in the last 5 years due to increased demand for food production and also related to more favourable subsidies for agriculture land use while subsidies for afforestation were not so attractive for landowners."
Montenegro	"The NFI gave much higher growing stock values than former stand inventories and appurtenant FMPs. There was critical lack of budget funds for realisation of the forest planning and afforestation."
Spain	"In general, forest policies place great emphasis on increasing the forest area of a country, region, etc. This fact being positive, the same importance should be given to make sure that this new forest area is correctly managed, according to the SFM principles, in order to avoid risks of forest degradation due to forest fires, pest and disease, abandonment, etc."
Ukraine	"Complexity of procedure of issuing deeds of rights for plots of land restrains level of afforestation. There is a need to improve procedure of inventory of nature afforested lands and transferring them for forestry purpose"

Financial instruments and economic policy

Grants and subsides are the most widely used financial instruments

3 countries reported on specific changes in financial instruments for land use and forest area since 2011, e.g. significant budget cuts in the grants provided for afforestation (Iceland), public funds expected to be used for the financing of private forest management planning (Montenegro), the further application of rural development programmes using EU funding with economic assistance for reforestation activities (Spain).

The most frequently reported financial instrument used are grants/ subsidies, which are mainly provided for, e.g. afforestation (Iceland, Hungary, Denmark) and the establishment of forest belts on private land as windbreaks and maintenance of respective plantations up to canopy closure (Romania), forest infrastructure (France), forestry planning and forest extension measures (Norway), forest fire protection measures (Slovak Republic), protective forest maintenance (Austria, Switzerland), creation of woodland and its management and the aim of sustaining and increasing the delivery of public benefits (UK), and the establishment of new forests by private forest owners (Ireland).

Informational means

The major trend here was the continued use of existing information instruments

The majority of countries (24 out of 34) reported "no changes". Nevertheless, 8 countries reported changes in relation to their national forest inventories (Luxembourg, Spain, Bulgaria), use of social media (Austria), and use of new technologies such as GIS and remote sensing (Slovak Republic, Turkey, UK).

Table 14. Examples of significant changes in legal/regulatory frameworks since 2011

Countries	Law
Romania	New chapters on the integrity of forest land; uniform regulations for public and private forest property; forest expansion and support for sustainable management of private forests and forests owned by administrative bodies.
Switzerland	"The federal Law on Forest has been revised by 1 July 2013: In certain cases of deforestation, it is now possible to implement measures instead of compensation in kind: in areas with increasing forest area, as well as in other areas by way of exception in order to conserve arable land and areas of ecological or landscape value. Furthermore, compensation for deforestation may be dispensed with in the case of deforestation of areas that have grown in the last 30 years in order to reclaim arable land, to guarantee flood protection and to rehabilitate waters as well as for the preservation and improvement of biotopes. In addition, static forest boundaries can be designated in relation to the open land on the basis of overall planning (in particular spatial planning)."

Indicator B2 Carbon balance

The main trends in the area of climate change mitigation and substitution of non-renewable materials constitute an increase in carbon sequestration and carbon storage in forests and in wood products

Status, trends and main changes in policy objectives since SoEF 2011

Indirect measures such National Forest Programmes, research and new applications of bioeconomy for the use of wood are the most common policy objectives in the context of the management of the carbon balance

Almost ten years ago in 2007, policy objectives were focused primarily on promoting bio-energy and reducing greenhouse gas (GHG) emissions. In line with international commitments (see also Indicator A3) and debates on the mitigation of and adaptation to climate change, in 2010 many countries reported a stronger focus on carbon sequestration by forests and the adaptation of forests to climate change. In addition, several countries mentioned the importance of increasing the use of wood as a raw material and renewable energy source and of reducing national GHG emissions.

The EU Member States consistently reported policy objectives that were in line with the three principal objectives of the EU Climate and Energy Package 2008. These are the achievement by 2020 of: a) a 20% reduction in GHG emissions; b) the provision of 20% of the energy supply from renewable energy sources; and c) improved energy efficiency. In 2014 the EU set a new goal for the reduction of GHG emissions to 40% below the 1990 level by 2030. An EU-wide binding target for renewable energy of at least 27% was also set. These targets prompted renewed ambitions for energy efficiency policies in EU, a new governance system and a set of new indicators for ensuring a competitive and secure energy system.

In 2015, 25 out of 33 countries reported that they still have specifically formulated policies in this area and 21 reported no major change in their policies (Table 15). However the tone appears to have changed; fewer countries place the main emphasis on carbon sequestration in the forest. Sequestration is more prominent now as an integral component of sustainable forest management and, in particular, part of an adapted ecosystem. Consideration of the full sequestration chain, the manufacture of wood products and, eventually also, the generation of renewable energy have also gained in importance.

The most prominent/frequently reported change in policy relates to the introduction of clearly defined objectives regarding climate change in forest policy documents (Cyprus, Estonia), particularly in relation to forests as carbon sinks (Spain) and resistant/adapted tree biotypes (Romania).

Over half of the reporting signatories (17 out of 34) reported on key measures in relation to the carbon balance (Table 16).

National forest programmes and their equivalents are the main tools used in putting the policies or strategies into action. Subsidies are directed at various actions in the countries. In some cases subsidies have stimulated some afforestation or a shift towards a more diverse and adapted ecosystem.

In other cases subsidies have stimulated the use of small diameter wood for energy (Finland) and other types of subsidies have prompted the installation of small boilers or import of pellets from the US and Canada for large utilities (Netherlands).

Few countries reported on key lessons learnt (Table 17), the answers referred to very heterogeneous issues depending on specific conditions in the individual countries.

Table 15. Specific policy objectives related to the carbon balance

Country	Objectives
Austria, Czech Republic	Research/knowledge/information on climate change impacts on the forest, its health and functions
Belgium, Bulgaria	Increase of up to 20% in the share of RES by 2020 (in accordance with EU policies and objectives and UNFCCC COP 18 in Doha)
Croatia	Low carbon development strategies
Cyprus, Czech Republic, Estonia, Finland, Latvia, Iceland, Norway, Poland, Slovenia, Spain, UK	Carbon sinks/stocks in forest biomass, soil, wood products (timber construction)
CzechRepublic,Bulgaria, Romania, Slovak Republic, Switzerland, Sweden)	Climate change mitigation and adaptation
Finland, Hungary, Montenegro, UK	Wood energy production
Ukraine	Reduction of GHG emissions

Institutional framework

Ministries continue to be the main institutions in charge

The ministries are the main institutions involved in activities relating to the topic of the carbon balance (e.g. environment, economic affairs, industry ministries, etc.)

Although many countries reported that they established separate climate agencies/centres/divisions between 2007 and 2011 to implement national climate and air quality policies and to coordinate and implement the UNFCCC and Kyoto Protocol, the majority of signatories reported "no changes" in relation to the carbon balance in this new reporting period.

Only 4 countries carried out administrative/institutional/ministerial changes (re-organization) that were reported under indicator B2 (Croatia, Finland, UK, Spain); i.e. Spain has developed the inter-ministerial Commission for Climate Change. Generally, changes in institutional frameworks relate to overall institutional reforms (organizational/administrative) in the environment/forest sector (for more information, see part A Overall institutional frameworks) and not specifically to this indicator.

Spain

In December 2011, the inter-ministerial Commission for Climate Change was further enhanced with a view to coordinating the measures and actions taken against the climate change with different ministries. There is a Directorate General under the MAGRAMA dealing with climate change issues (http://www.magrama.gob.es/es/cambio-climatico/temas/default.aspx). This unit is responsible for reporting to UNFCCC and compliance with EU regulations, mainly ETS and LULUCF. It also deals with the register created by royal decree 163/2014.

Legal/regulatory framework and international commitments

The legal basis consisting of legislative acts and a variety of regulations on forests, energy efficiency, climate change, environmental protection has remained stable since 2011

The legal basis mainly consists of legislative acts and a variety of regulations on forests, energy efficiency, climate change and environmental protection. The majority of signatories (22 of 34) reported no changes, however 7 signatories reported changes (Table 18).

Table 16. Key measures for the implementation of policies on forest carbon

Country	Key measures
Austria, Bulgaria, Luxembourg, Montenegro, Spain, Sweden	National forest programmes and forest/energy strategies, climate /biomass action plans, implementation roadmaps, decrees etc. In the case of Bulgaria, in the National Climate Change Action Plan 2013-2020 for the land-use sector, land-use changes and forestry, there are measures for the restoration and maintenance of the forest shelter belts and plantation of new anti-erosion stands, and for the utilization of non-forest lands via afforestation
Czech Republic, Hungary	National rural development programmes (co-financed by EU) which include afforestation measures
Slovak Republic	Government subsidies and investment support for the use of bioenergy (Finland) and forest fire protection and protection of forests from damages
Romania	Research and innovation projects/programmes
Croatia, Slovak Republic	Improvement of national forest/carbon stock inventories
Hungary	Close-to-nature forest management which improves the level of carbon sequestration and storage.
Iceland	Introduction of afforestation and land reclamation into carbon accounting.

Table 17. Key lesson learnt on carbon balance policies

Country	Key lessons learnt
France, Iceland	Climate issues have been increasingly recognised by national forest legislation and included in national forest policy documents, in particular in relation to the adaptation of forests to climate change and carbon accounting.
Spain	If the role of forests in mitigating climate change is to be fully recognized, it is vital that forest carbon accounting be clearly defined and easily implemented.
Ukraine	There are the difficulties in obtaining financial support for research on the adaptation capacities of forest ecosystems and impact of climate change on forests and forestry.
Slovak Republic	More support and specific measures for the promotion of the energy use of forest biomass.
European Union	Managed forests in EU remain a sink (they capture more CO2 than they release), however this sink is expected to decrease sharply between the first (2008-2012) and second (2013-2020) commitment periods of the Kyoto Protocol.

Financial instruments and economic policy

The creation of a Forest Climate Fund in Germany and the establishment of a Climate Component in the LIFE programme are the main developments regarding financial instruments

The majority of reporting signatories (27 of 34) reported "no changes". However, two signatories reported specific changes in the financial instruments used in relation to the carbon balance: establishment of a Forest Climate Fund (Germany) and a Climate Component of the LIFE programme, which highlights nature-based solutions and forests (European Commission).

Informational instruments

Changes in informational means for the carbon balance mostly relate to the overall national communication strategies

Most of the reporting signatories (26 of 34) reported "no changes" in the informational means relating to the indicator B2 Carbon balance.

However, 6 countries reported changes relating to the overall national communication strategy or use of informational means (Austria, Finland). Germany reported on the establishment of a Forest Climate Fund Programme, Turkey on an annual inventory of forest carbon stock and Spain on the Spanish Directorate-General for Climate Change, which provides extensive information about climate change and measures.

Table 18. Changes in legal/regulatory frameworks related to the carbon balance

Adoption of new legislation/acts in relation to climate /energy	Belgium, Bulgaria, Finland, Spain, Ireland
Incorporation of EU legislation in relation to climate change mitigation and adaptation to national legislation through amendments	Croatia
Translation of international commitments under the UNFCCC to the EU context	EU Commission

Criterion 2: Maintenance of Forest Ecosystem Health and Vitality

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Data resources: Quantitative Indicators: Indicators 2.1, 2.3 - Information delivered by ICP Forests/EC-JRC. Indicator 2.4 – National report on Joint FOREST EUROPE/UNECE/FAO Questionnaire on Pan-European Indicators for Sustainable Forest Management.Quantitative indicators.
Indicator 2.2 - EC-JRC.

Qualitative Indicators: Indicator B3 – National reports on Reporting on the pan-European Qualitative Indicatorsfor Sustainable Forest Management.

Key findings

Indicator 2.1 Deposition of air pollutants

The deposition of nitrogen, sea-salt corrected sulphate sulphur, sea-salt corrected calcium, and sea-salt corrected magnesium vary across the different regions of Europe. Nitrogen – both ammonium (N-NH4) and nitrate nitrogen (N-NO3) – predominates in Central-West Europe and some parts of South Europe. The deposition of nitrogen is generally lower in North Europe than in other regions. The deposition of sea-salt corrected sulphate sulphur is high across most of Europe, except in North Europe. The input of sea-salt corrected calcium and magnesium is generally higher in the southern regions of Europe. Nearly all elements have shown a decrease over time since 1997, which is greater in Central-East Europe and smaller, but continuous, in Central-West and North Europe. In contrast, nitrogen and calcium deposition have increased in South Europe, and there is also a slight increase in nitrogen deposition in the Central-East European region.

Indicator 2.2 Soil condition

Data from the first soil survey component of the Land Use/Cover Area frame statistical Survey (LUCAS) substantiate that, for forest areas, soil organic carbon (SOC) content in the European Union (EU) increased following a south-east to north-west trend. There is also a marked tendency of SOC levels to increase with elevation, which results in mountainous areas in the Mediterranean having a mean SOC level comparable to samples collected inlow-level northern and western parts of the EU. In the survey, 15% of the samples in forest areas, mainly from sites in Scandinavia, show high SOC content. Given the significance of ecosystems with high SOC content such as peat bogs as potential sinks or sources of greenhouse gases and, accordingly, their mitigation potential for climate change, this figure calls for special emphasis to be placed on the northern forest areas.

Indicator 2.3 Defoliation

The tree-crown condition parameter defoliation was assessed in 104,994 trees comprising 129 different tree species. Nearly one quarter of the trees surveyed in 2014 were assessed as damaged. However, tree crown condition has remained unchanged on two thirds of the plots over the last ten years, and the number of plots on which it increased was more or less equal to the number on which it decreased.

Indicator 2.4 Forest damage

The most frequently observed causes of damage in Europe's forests are wildlife and grazing, insects and diseases. Damage by forest fires, storm, wind and snow and by forestry operations are observed in well below 1% of the European forest area. The amount of area affected gives no indication of the severity of the damage and the associated economic losses.

Indicator B3 Health and vitality

Health and vitality were one of the main concerns for the European countries at the start of the pan-European process and they remain in the spotlight for many countries today.

Most of the countries reported specifically stated objectives in relation to forest health and vitality (improvement of resistance, monitoring systems and climate change mitigation).

Almost one third of the countries reported changes in policy objectives with a specific focus on climate change or specific problems like forest fires and particular insects.

With the exception of the new European Commission COM (2013) 267 Proposal for a regulation on protective measures against pests of plants, which represents a major change at EU level, no major changes in institutional, legal or financial instruments were reported in relation to 2011.

Regarding informational means, apart from improvements, such as new web portals and the use of social media to reach wider audiences, no changes were reported in the majority of cases.

Indicator 2.1 Deposition of air pollutants

Introduction

The measurement of atmospheric deposition is one of the core activities of the intensive monitoring (Level II) plots of the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) under the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP). The Programme aims to quantify the acidifying, buffering and eutrophying compounds deposited in forests. Long-term inputs of deposited substances can adversely affect forest ecosystems. More sensitive compartments in the forest, such as epiphytic lichens or vascular plants in the ground vegetation, may respond earlier and to smaller amounts of deposition. However, the monitoring of macro- and micronutrients which enable forest growth is also a major concern.

The Status section below documents the mean throughfall and – where applicable – stem flow

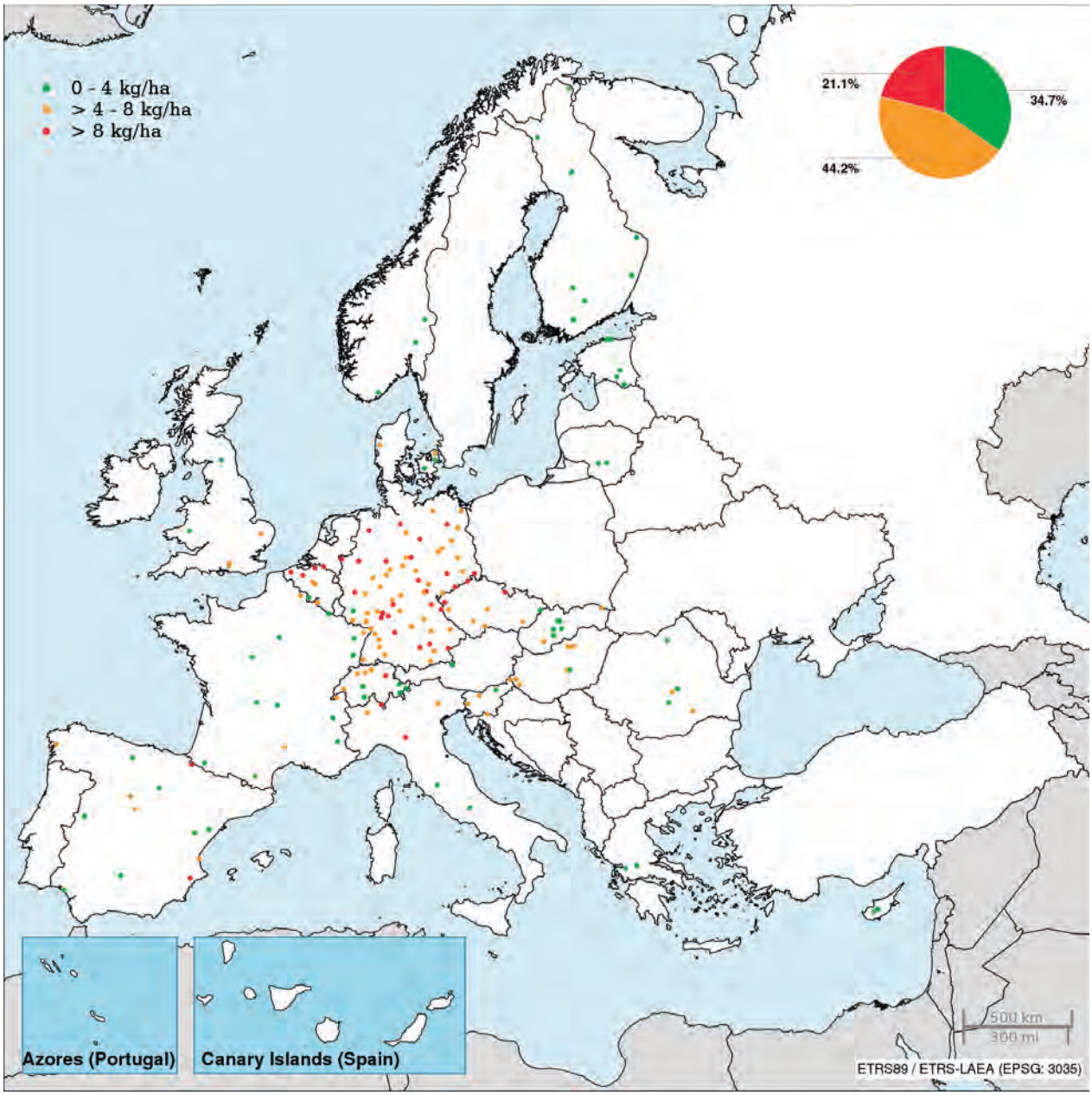

Figure 30. Mean throughfall deposition of ammonium nitrogen (kg N ha-1 yr-1) in Europe during 2012 and 2013

deposition in 2012 and 2013. Current information for status evaluation is available from 19 countries with 199 intensive monitoring Level II plots. The trends were assessed using 161 plots in 16 countries.

Status

Figures 30 to 34 show the current throughfall deposition of nitrogen (derived from nitrate and ammonium), sea-salt corrected sulphur (derived from sulphate), sea-salt corrected calcium and sea-salt corrected magnesium (mean for the years 2012 and 2013).

Central-West Europe had the highest ammonium nitrogen deposition. High fluxes were less common in plots in South and Central-East Europe (Figure 30). The lowest deposition is mainly observed in North Europe. Despite the fact that the general spatial pattern observed for nitrate nitrogen deposition (Figure 31) is similar to that of ammonium nitrogen, high deposition was also found in Denmark, Cyprus, Lithuania and Spain.

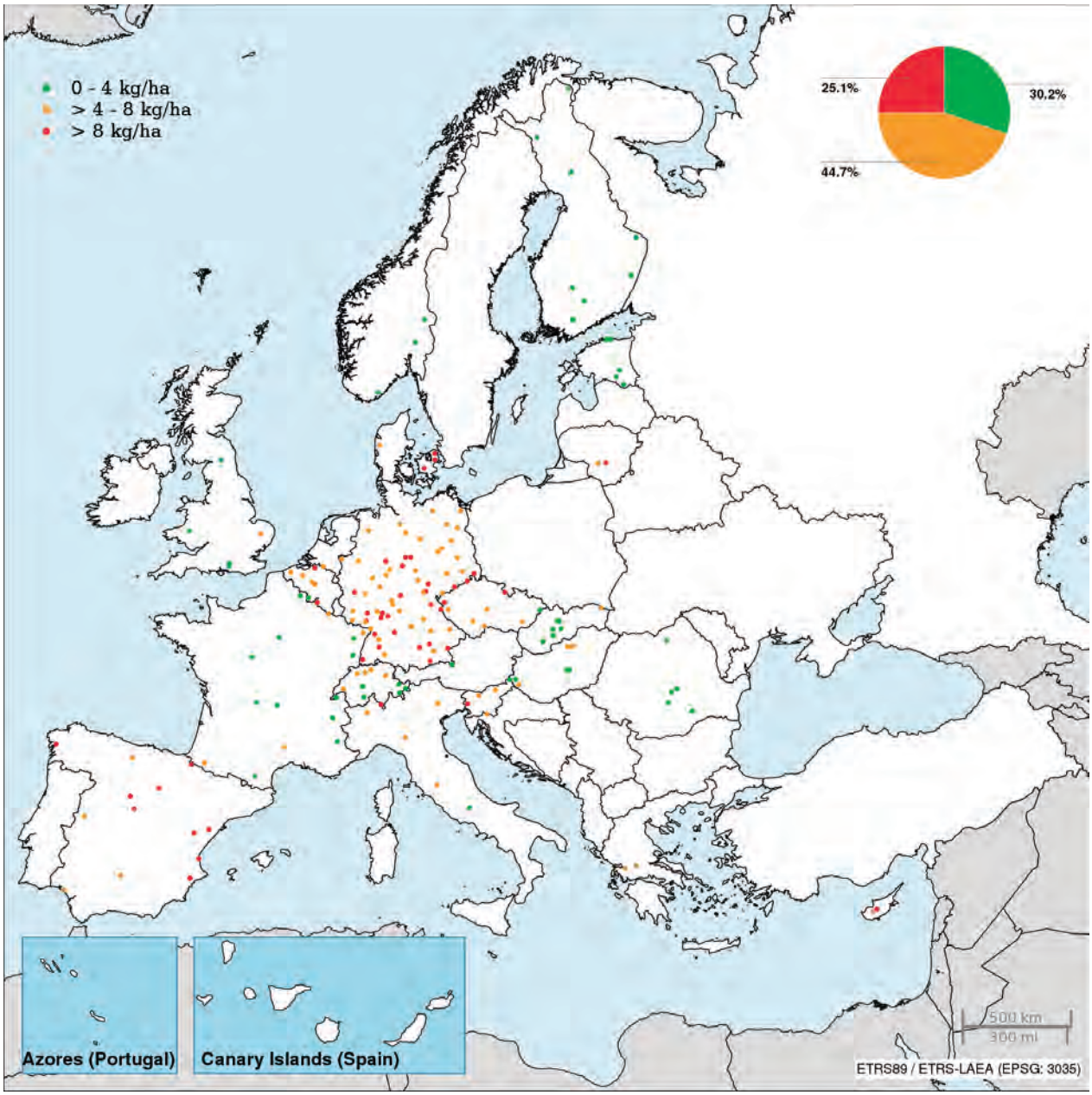

Figure 31. Mean throughfall deposition of nitrate nitrogen (kg N ha-1 yr-1) in Europe during 2012 and 2013

The lowest deposition was found, again, in North Europe. High deposition of sea-salt corrected sulphate sulphur is observed in Belgium and on the ridges of the low mountain ranges extending from Germany to the Czech Republic (Figure 32).

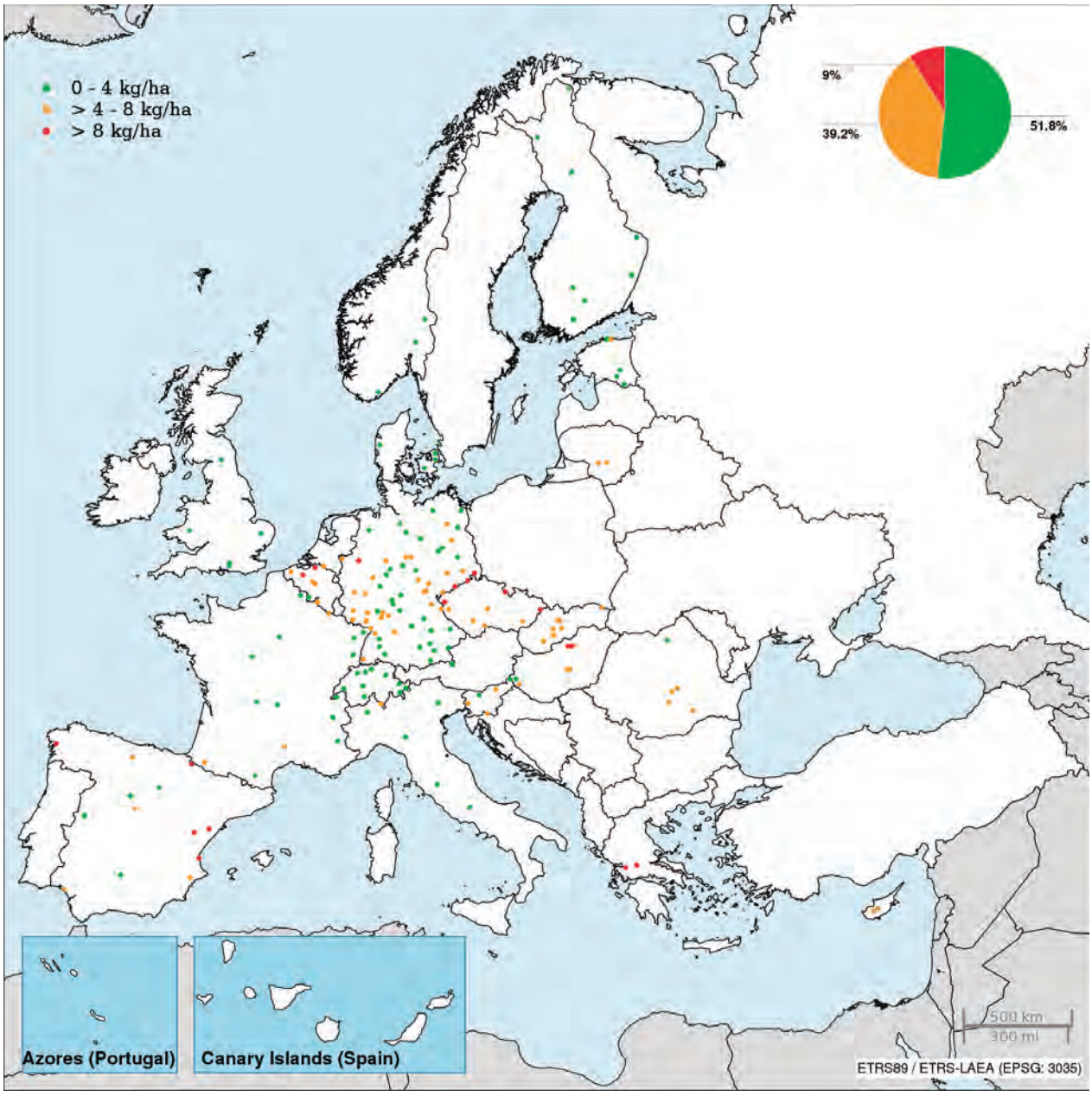

Figure 32. Mean throughfall deposition of sea-salt corrected sulphate sulphur (kg S ha-1 yr-1) in Europe during 2012 and 2013

Higher values were also found in Hungary, Spain and Greece. While most of the plots in Central-Westand North Europe are in the lowest range, the medium range prevails in Central-East Europe. Calcium is an important element for the neutralisation of acidifying inputs. The highest values of sea-salt corrected calcium deposition (Figure 33) are found on plots in the Mediterranean basin and in regions of Central-East Europe. Low calcium deposition prevails in most of North Europe.

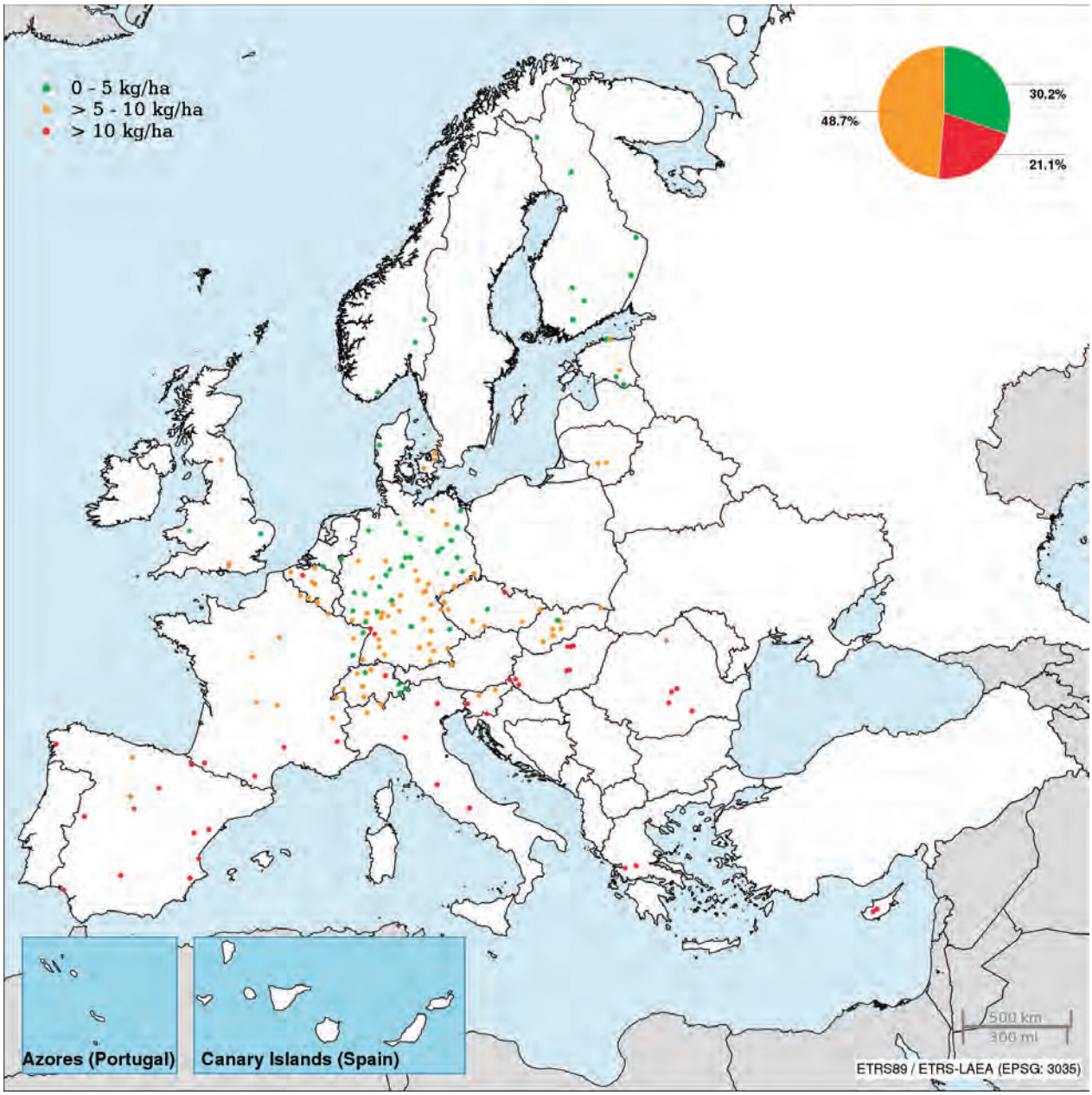

Figure 33. Mean throughfall deposition of sea salt corrected calcium (kg Ca ha-1 yr-1) in Europe during 2012 and 2013

In contrast to calcium, most inputs of magnesium are clearly seaborne and, after sea-salt correction, few plots received more than 1.5 kg Mg ha-1 yr-1 (Figure 34). Plots with higher levels of deposition are located in South and Central-East Europe.

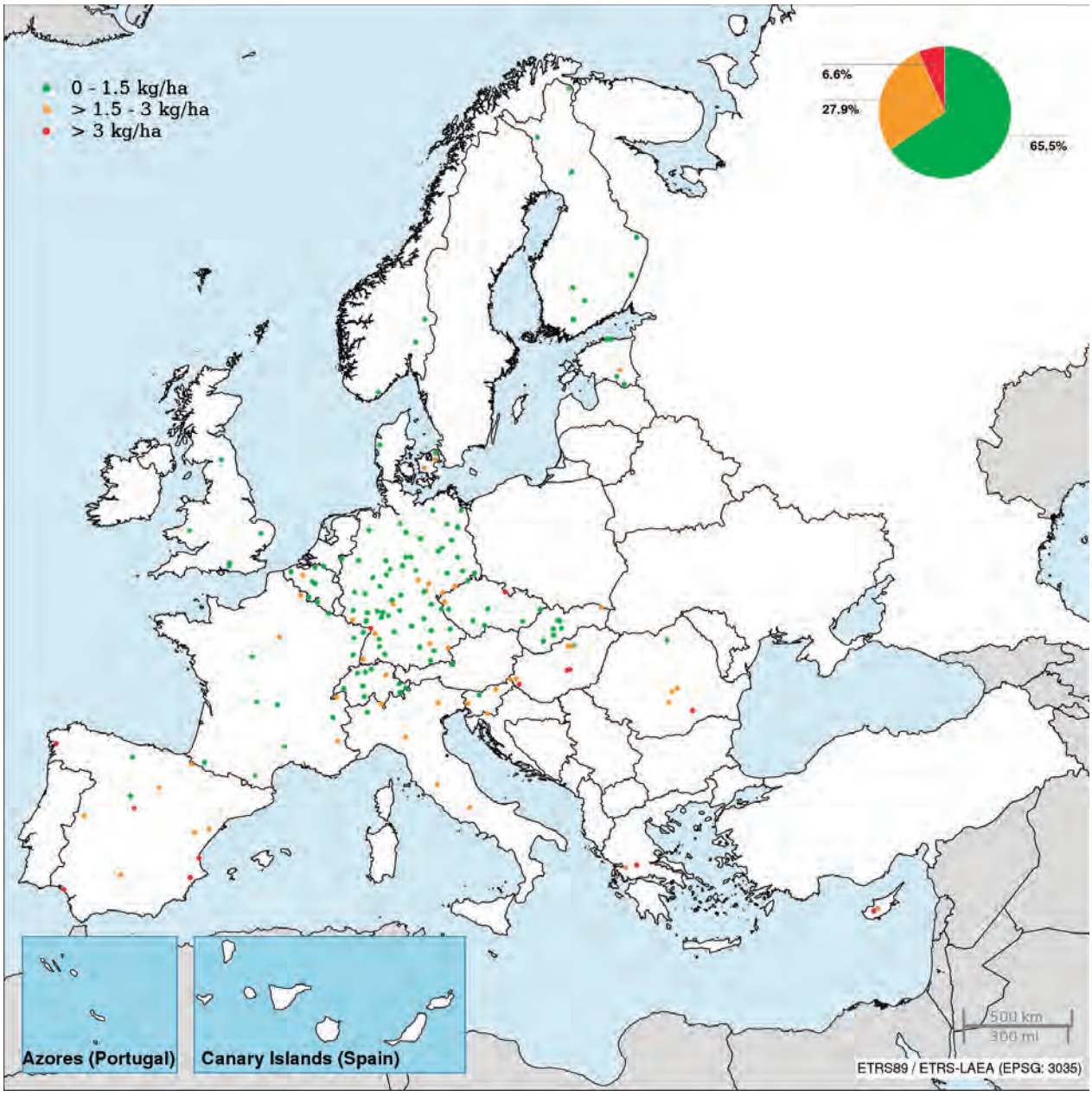

Figure 34. Mean throughfall deposition of sea salt corrected magnesium (kg Mg ha-1 yr-1) in Europe during 2012 and 2013

Trends

Between 1997 and 2013, ammonium and nitrate nitrogen deposition decreased mainly in Central-West and Central-East Europe, whereas, due to the large amounts recorded in Spain, deposition in southern Europe increased in the latter years of this period (Figures 35 and 36). Low level ammonium and nitrate nitrogen deposition continued to decline slightly in North Europe. Sea-salt corrected sulphur deposition over most of Europe decreased significantly from 1997 to 2013 (Figure 37). Sea-salt corrected calcium deposition decreased in North and Central-West Europe throughout the monitoring period (Figure 38). In South Europe, there is a very large fluctuation from year to year. Magnesium deposition trends were similar to those of calcium, however there is evidence of an increase in South and Central-East Europe in more recent years (Figure 39).

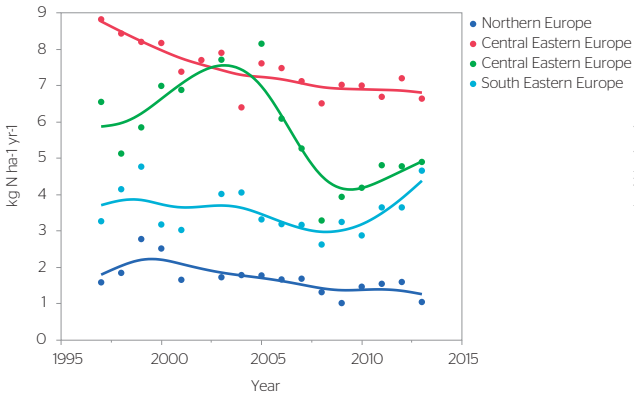

Figure 35. Time series with spline of ammonium nitrogen deposition (kg N ha-1 yr-1) for different regions in Europe from 1997 to 2013

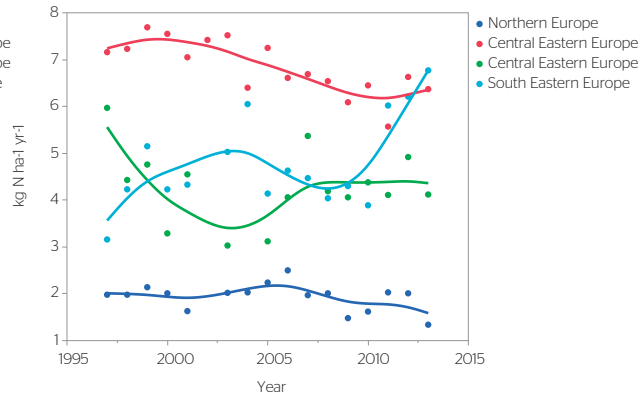

Figure 36. Time series for nitrate nitrogen deposition (kg N ha-1 yr-1) in different regions in Europe from 1997 to 2013

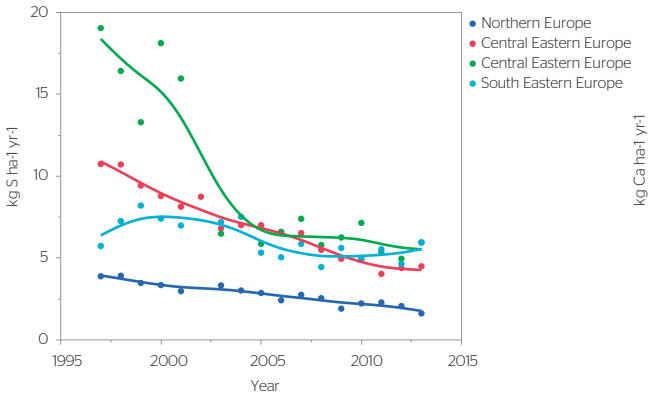

Figure 37. Time series for sea-salt corrected sulphate sulphur deposition (kg S ha-1 yr-1) in different regions in Europe from 1997 to 2013

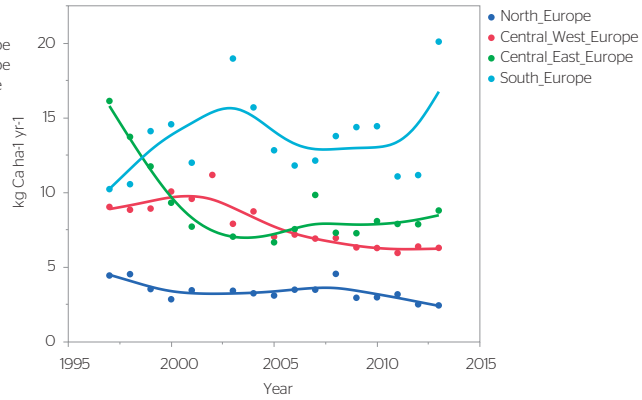

Figure 38. Time series for sea-salt corrected calcium deposition (kg Ca ha-1 yr-1) in different regions in Europe from 1997 to 2013

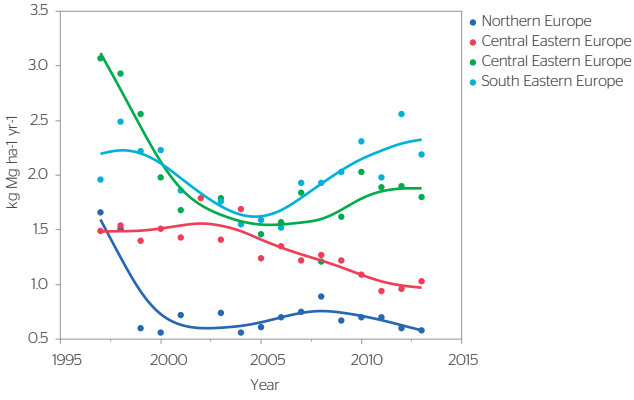

Figure 39. Time series for sea-salt corrected magnesium deposition (kg Mg ha-1 yr-1) in different regions in Europe from 1997 to 2013

Indicator 2.2 Soil condition

Introduction

The indicators of soil conditions are linked to society's efforts to secure the soil resource base for healthy forests while mitigating climate change through the storage of atmospheric carbon in the soil. The forest soil ecosystem services are threatened when the main soil condition parameters, in particular pH and soil organic carbon (SOC) levels, are changed unfavourably. Increasing SOC content in the soil is generally regarded as a positive development for various soil functions, including water holding capacity, nutrient management and climate regulation, while a decrease in SOC level is an indicator of soil degradation. Soil pH is one of the main abiotic indicators of forest ecosystems. Given that the type and health status of forest vegetation is strongly influenced by soil pH, this indicator needs to be evaluated together with and in relation to the local flora. Nevertheless both the SOC content and pH are helpful indicators in the monitoring of changes in soil conditions.

To monitor key chemical and physical soil parameters across all Member States of the European Union (EU), a soil survey component was added to the Land Use/Land Cover Area Frame Survey (LUCAS). The soil survey builds on the experience of earlier pan-European forest soil sampling surveys, especially the Bio Soil Demonstration Project and the sampling procedures for soil conditions of Forest Focus. Particular to the LUCAS soil survey is that a compound sample is taken for the top 20 cm across all land cover types, but limited to areas with an elevation below 1,000 m. The use of a single laboratory for the analysis is a novelty in pan-European soil sampling introduced by the LUCAS Soil survey is. This approach should provide more comparable information on soil conditions in the EU.

The first survey was performed in 2009 in 23 EU Member States and in 2012 in Bulgaria and Romania. Malta and Cyprus subsequently provided soil samples despite the fact that the main LUCAS survey was not carried out on their territories.

Given the differences in soil sampling methods a comparison of the results from the first LUCAS Soil survey with other surveys is a complex task. Data from the first LUCAS Soil survey form the baseline of the LUCAS Soil monitoring activity. Regular resampling is planned every six years. The second survey is due to take place in 2015 with first results foreseen for 2016. More reliable trends for changes in soil condition can be expected from these repeated surveys when sampling and analysis methods remain invariable.

Status

During the first LUCAS Soil survey a total of approximately 22,000 soil samples were collected, of which 5,819 (26%) were under forest. Of these, 79.5% had SOC contents of less than 12% in the top 20 cm sampled, 5.6% had SOC contents higher than 12% with a mineral component and 15.9% contained only organic matter (peat) without a mineral component. The distribution of the soil samples categorised by SOC content across the main regions is indicated in Table 19. The levels of SOC content in the samples collected in forest areas are quite variable, both across and within the SOEF regions. The highest SOC content levels were found in North Europe and Central-West Europe regions where cooler and more humid conditions encourage the accumulation of soil organic matter. The lowest SOC contents were found in the samples collected in the Mediterranean area. In general, SOC concentrations in the samples with < 12% SOC content collected in forest areas in North Europe and Central-West Europe regions were 25-50% higher than those

Table 19. Soil Organic carbon concentration of LUCAS Soil samples by SoEF region

SOEF Region	< 12 % Soil Organic Carbon			>= 12 % Soil Organic Carbon					
				with mineral component			with mineral component		
	Mean g kg^{-1}	Std. Dev. g kg^{-1}	No.	Mean g kg^{-1}	Std. Dev. g kg^{-1}	No.	Mean g kg^{-1}	Std. Dev. g kg^{-1}	No.
North Europe	42.3	27.2	2328	152.7	23.0	248	396.7	99.2	810
Central-West Europe	40.1	24.9	957	153.1	233	40	302.5	98.10	44
Central-East Europe	25.5	19.0	603	150.6	20.7	15	325.6	73.8	11
South-West Europe	36.7	25.9	521	146.1	24.7	13	223.6	20.0	2
South-East Europe	29.1	24.6	214	156.3	21.6	10	338.8	93.7	3
EU27*	38.4	26.2	4623	1525	22.9	326	390.4	101.4	870

*Croatia not included, was not an EU Member State at the time of the survey.

from samples collected in Central-East or South-East Europe, reflecting the very different climatic and biotic factors.

Compared to other land cover types the mean SOC content in the LUCAS Soil samples is higher in forest areas than in samples from cropland, shrub lands and grassland, albeit with sub-regional variations. The samples with a high SOC content are almost exclusively collected from sites in the region of North Europe. 93% of the samples without mineral component (13.9% of all samples) are located in this region, which indicates the significance of these forest areas in the context of climate change.

Soil pH is a consequence of several soil-forming factors and parallel soil processes. Analysis of the LUCAS topsoil database shows that woodlands reflect these mechanisms. Around 85% of samples from woodlands in the North-Europe region show very acidic conditions (pH <4.5); there is an almost total absence of samples from alkaline soils. This reflects the predominant podzolic conditions of the former and the coarse-textured highly leached soils. Although slightly less pronounced, this situation is also reflected in Central-West Europe, Central-East Europe and South-West Europe, but with a broader spread of values. In South-East Europe, the distribution is less acidic and tends to neutral conditions; the highest proportions of alkaline samples are found here. This probably reflects the chemistry of the parent material. The data show that the woodland land-use category in LUCAS reflects a wide range of soil pH conditions, with predominance towards more acidic conditions outside the Mediterranean region.

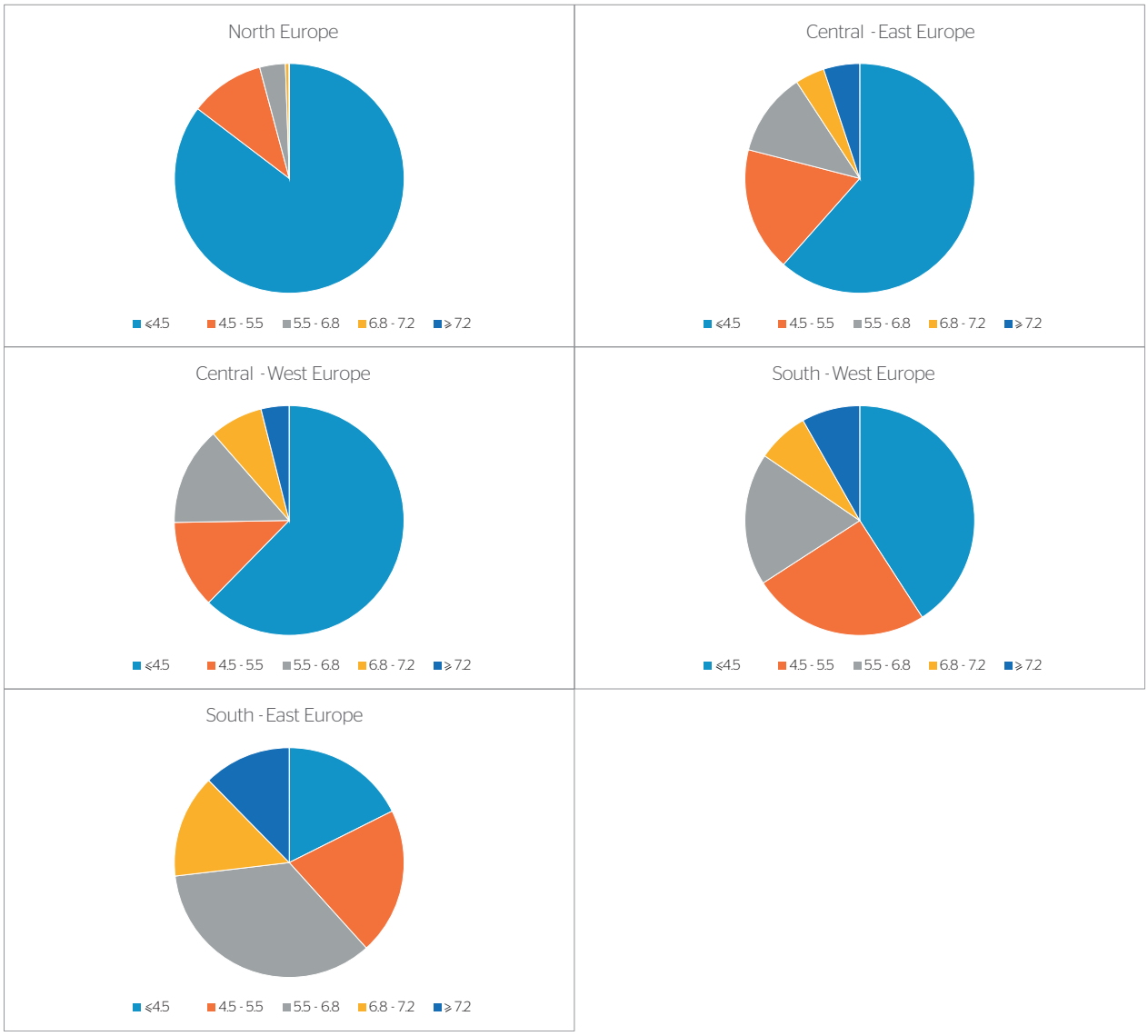

Figure 40. Share of LUCAS topsoil samples with different pH categories by region

Indicator 2.3 Defoliation

Defoliation of one or more main tree species on forest and other wooded land in each of the defoliation classes 'moderate', 'severe' and 'dead'

Introduction

The performance of forest trees in Europe is systematically monitored, mainly by surveys of the two crown condition parameters defoliation and discolouration. Defoliation is an indicator of tree performance or health. It responds to many different factors, such as climate conditions, including weather extremes, deposition, insect attacks and fungal infestations. Defoliation is a valuable early-warning sign for the response of forest trees to environmental changes, which can be both anthropogenic or natural in origin.

Fully foliated trees are rated with 0% defoliation and are regarded as healthy up to a defoliation level of 25%; those with over 25% of leaf or needle loss are classified as damaged. A defoliation level of 100% indicates dead trees. For 2014, crown condition data were assessed on 5,611 plots in 24 countries. The data assessment is carried out annually within the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) through its member states.

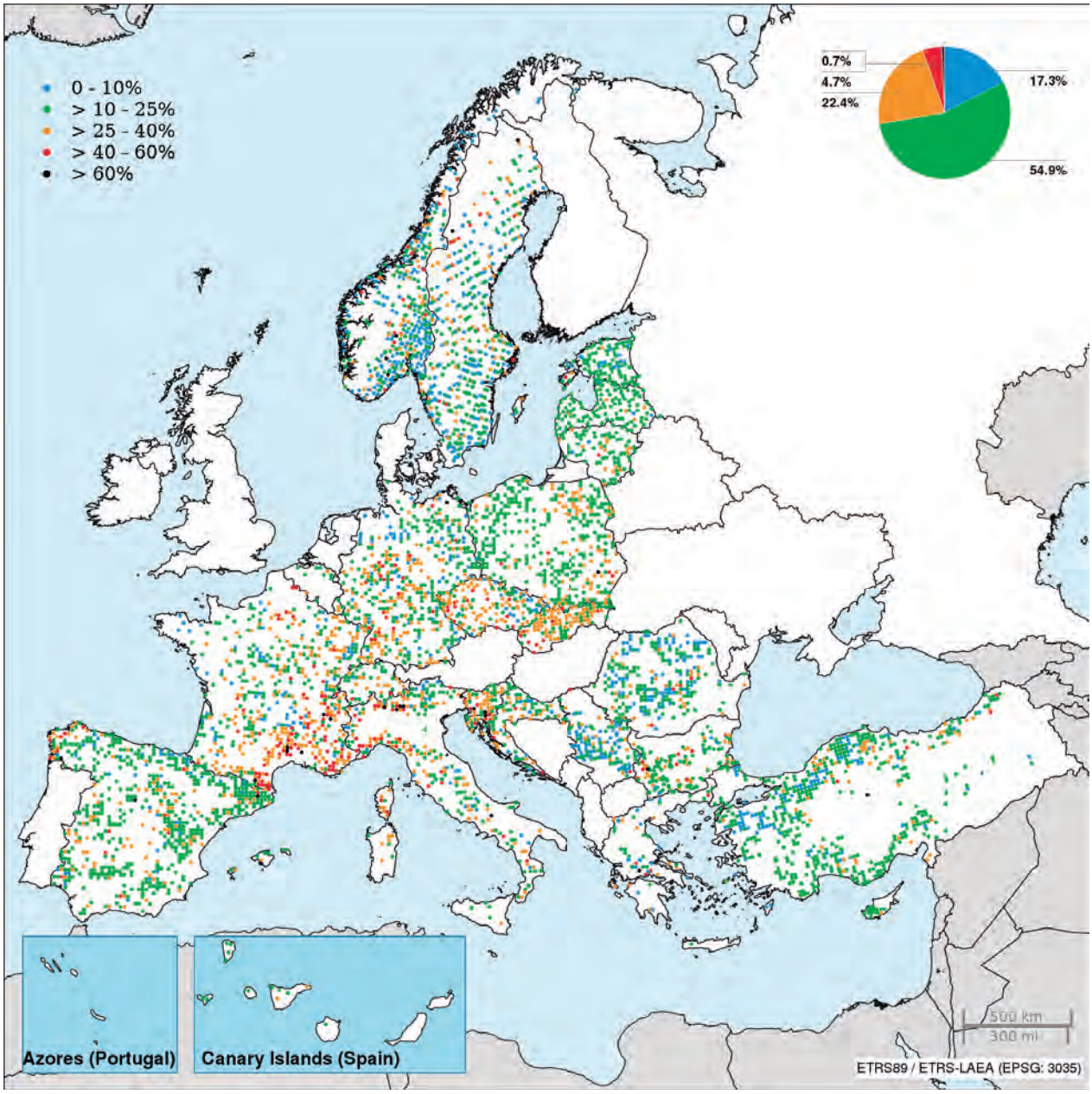

Figure 41. Mean plot defoliation of all tree species 2014. Note: some of the differences in the level of damage across national borders may be due to variations in the standards used. However, this restriction does not affect the reliability of trends over time

Status

In 2014, 23.9% of all assessed trees had needle or leaf loss exceeding 25% and were thus classified as either damaged or dead. However, the status and trends in forest conditions vary regionally and by species. Mean defoliation across all tree species was higher in central Europe and along the Mediterranean coast in Croatia, Italy, and France than in the other regions. Plots with lower mean defoliation were clustered in Northern Europe and in some Eastern European countries, Turkey and Spain (see Figure 41).

Trends and explanations

Defoliation increased on 17.7% of the plots that were continuously monitored with a minimum assessment length of ten years over the period 2002 to 2014. It decreased on 14.8% of the plots, thereby indicating an improvement in crown condition. There was no change in mean plot defoliation on around two thirds of the monitored plots (see pie chart, Figure 42).

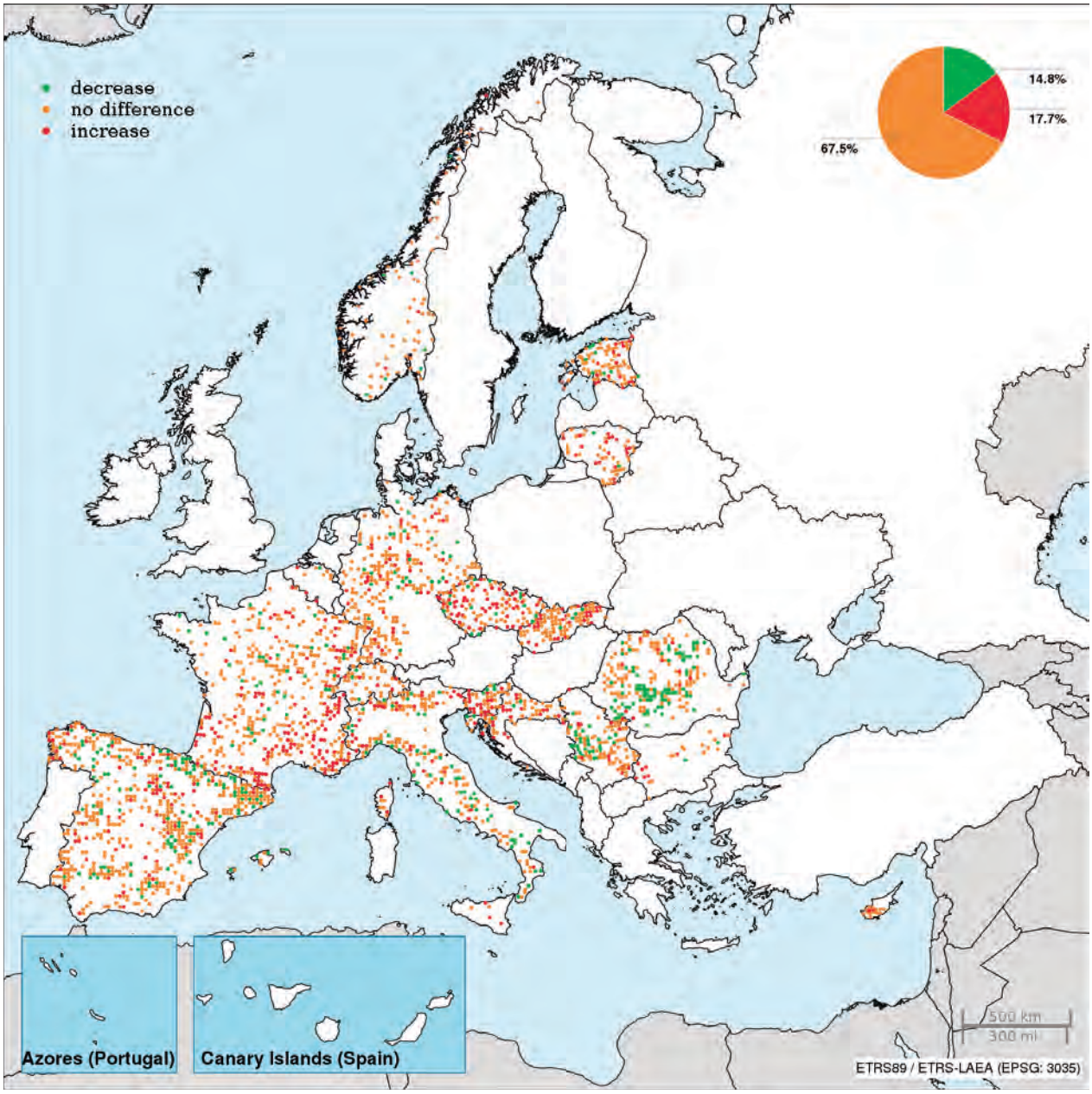

Figure 42. Trend in mean plot defoliation of all species over the years 2002 – 2014 with a minimum assessment length of 10 years. Due to changes in plot location, this evaluationcannot be carried out in some countries and regions

Of the principal tree species, *Quercus robur* and *Quercus petraea* presented the highest combined level of damaged and dead trees in 2014. With the exception of 2013 when *Quercus ilex* had the highest mean defoliation of all the principal species, both species also presented the highest mean defoliation over the past decade. The defoliation of *Quercus ilex* had already increased significantly in the mid-1990s. This may have been triggered by climatic drought. While crown condition for *Pinus sylvestris* and *Picea abies* presented no clear trend over the last 19 years, it deteriorated considerably over the monitoring period for *Pinus pinaste*r and *Fagus sylvatica*, albeit with some fluctuations (see Figure 43).

The observed high levels of defoliation may indicate that trees have a reduced potential to withstand adverse environmental impacts. This is particularly relevant as climatic extremes are predicted to occur more frequently in the relatively near future, and because nitrogen deposition has only been reduced marginally, if at all, in recent years.

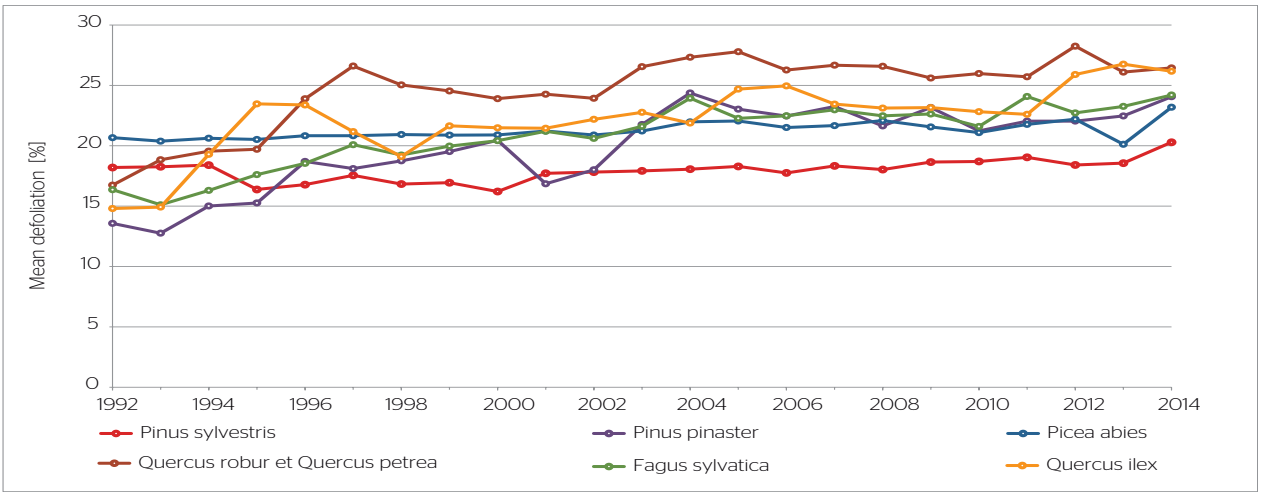

Figure 43. Mean percentage defoliation for principal tree species in European forests
Note: samples are based on data from countries with continuous data submission of at least 20 years

Indicator 2.4 Forest damage

Forest and other wooded land with damage, classified by primary damaging agent (abiotic, biotic and human-induced) and by forest type

Status

Several damaging agents affect forests in Europe. The agents can be biotic or abiotic, of natural or human-induced origin. Biotic agents include insects and diseases, wildlife, and cattle grazing in woodland. Abiotic agents include fire, storm, wind, snow, drought, mudflow and avalanche. Damage by biotic and abiotic sources is an essential component of natural ecosystems as it fosters processes such as regeneration, selection, adaptation and evolution. In managed forest ecosystems, however, damage often results in economic losses. Human-induced long-range impacts on the environment, such as air pollution and climate change, expose forests to aggravated risks; reduced health and vitality of forests may promote a cascade of damaging effects and hinder the sustainable management of forests. Future climate change could reinforce damage by drought, fire, storm and insect outbreaks.

Damaged forest area

A forest can be affected by more than one damaging agent, for example by insects following storm damage or drought. Therefore, in order to avoid double counting, the participating countries were requested to specify both the total area of damaged forests, regardless of the damaging agents, along with areas subject to individual damaging agents.

Information on the total area of forests with damage (see Table 20) was provided by 19 countries representing 119 million ha or 56% of the total forest area in the Forest Europe region (excluding the Russian Federation). Data provision was highest for Central-East Europe (93%) and lowest for Central-West Europe (2%) where only Belgium provided data on total forest area with damage. 3% of the total forest area in Europe is affected by damage. The largest proportions of forest areas with damage were reported for Romania (13.5%) and Portugal (10.4%), followed by Croatia (7.5%), Belgium (6.9%) and Hungary (6.4%). In the remaining 14 countries the proportion of forests with damage ranged from 3.6% (Bulgaria) to less than 0.1% (Slovenia, Latvia).

Insects and diseases

Heavy attacks by insects and phytopathogens (bacteria, viruses, fungi) may cause major impacts on forests, resulting in a weakening of forest ecosystem health and vitality and economic losses. Insect populations and micro-organisms are also likely to react to long-term change processes such as climate change. Furthermore, biotic damage may result in the deterioration of tree condition, not only in the year of occurrence, but also in later years. In particular, substantial storm damage and drought increase the risk of the mass propagation of bark beetles.

Information on the area of forest damaged by insects and diseases (see Table 21) was provided by 25 countries (73% of the forested area of Europe). A proportion of 1.4% of the forest area in Europe and 1.1% in the EU-28 is affected by damage caused by insects and diseases. With the exception of South-West Europe, where 9% of the forest area was subject to damage by insects and diseases, the respective forest area affected in the other European regions was smaller, ranging from 3% in the South-East region to 0.5% in the North region. The highest proportions of forest area damaged by insects and diseases were reported by Portugal (9%), Croatia (4.6%), Turkey (3.9%) and Bulgaria (3.1%).

Table 20. Reported forest area and forest area with damage

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	5,6402	79.7	1,022	1.8
Central-West Europe	681	1.8	47	6.9
Central-East Europe	40,665	92.7	1,543	3.8
South-West Europe	3239	10.6	336	10.4
South-East Europe	18,278	61.8	726	4.0
EU-28	98,257	61.7	3,005	3.1
Europe excluding Russian Federation	119,267	56.1	3,674	3.1

Table 21. Damage by insects and diseases

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	58,636	83	319	0.5
Central-West Europe	28,514	75	187	0.7
Central-East Europe	43,487	99	468	1.1
South-West Europe	3,239	11	290	9.0
South-East Europe	21,953	74	669	3.0
EU-28	119,523	75	1,269	1.1
Europe excluding Russian Federation	155,829	73	1,933	1.2

Wildlife and grazing

Forests are the habitat of different forms of wildlife. A large abundance of herbivore populations can pose a major threat to the regeneration of forests. With the exception of local incidences, grazing by domestic animals is generally not a problem in European forests. Information on areas subject to damage by wildlife and grazing was made available by 19 countries covering 48% of the forest area in Europe (see Table 22). No information was provided for South-West Europe. The forest area affected by damage from wildlife was highest in South-East Europe (3.4%) and Central-East Europe (2.9%). Data provided for the Forest Europe region, excluding the Russian Federation, indicated that 1.4 % of forests suffer damage by wildlife. The corresponding figure for the EU-28 countries was slightly lower (1.1%). Albania (33.8%), Romania (8.9%), Belgium (3.9%) and Ireland (3.4%) had the largest areal proportions affected by wildlife; in all other countries that provided data the corresponding proportion was well below 3%.

Forest fires

Fires occur in most European countries but they particularly affect forests in the Mediterranean region. While controlled burning increases ecosystem biodiversity, uncontrolled forest fires can have major negative consequences for the ecosystem, such as desertification, soil erosion and loss of water supply, and give rise to major economic losses every year.

The information on forest areas affected by fire was compiled from data available at the European Forest Fire Information System (EFFIS), which was developed jointly by the European Commission and European countries and hosted by the Joint Research Centre. This resulted in the provision of additional information on burnt area trends along with the data provided by countries to Forest Europe. In 2010, data were available for 40 countries (98.6% of the total European forest area). In that year, fire occurred on 0.27% (664,000 ha) of the reported forest areas (see Table 23). The

Table 22. Damage by wildlife and grazing

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	58,636	82	435	0.7
Central-West Europe	12,816	33	64	0.5
Central-East Europe	22,487	51	644	2.9
South-West Europe	n.a	n.a	n.a	n.a
South-East Europe	7,853	27	267	3.4
EU-28	101,015	63	1,148	1.1
Europe	101,792	48	1,410	1.4

Table 23. Damage by forest fires

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	76,557	100	2.0	0.00
Central-West Europe	35,824	92	12.8	0.04
Central-East Europe	44,586	99	377.4	0.85
South-West Europe	43,057	100	234.4	0.54
South-East Europe	44,981	100	37.4	0.08
EU28	177,353	98	270.7	0.15
Europe	245,005	99	664.0	0.27

percentage is slightly lower in the EU-28 (0.15% or 270,700 ha). The largest areas damaged by forest fires are found in Central-East (377,000 ha) and South-West Europe (234,000 ha), which together account for over 90% of the fire burnt areas recorded across Europe. In Central-East Europe the bulk of the damage was reported by Georgia, which experienced an unusually severe year for fires in 2010 (13.1% of forests burned: 371,000 ha); in the EU28 region, Portugal was most affected with 133,000 ha (2.8%) of forests burnt. Other affected countries were Albania (0.78%), Italy (0.43%) and Spain (0.2%). Most other countries reported less than 0.1% fire damage.

Figure 44 presents the trends in burnt areas in recent decades for all countries, for which data are available in the EFFIS. With the exception of Portugal, which recorded a peak in 2000-2009, the trend in most countries is for a slight fall in recent decades.

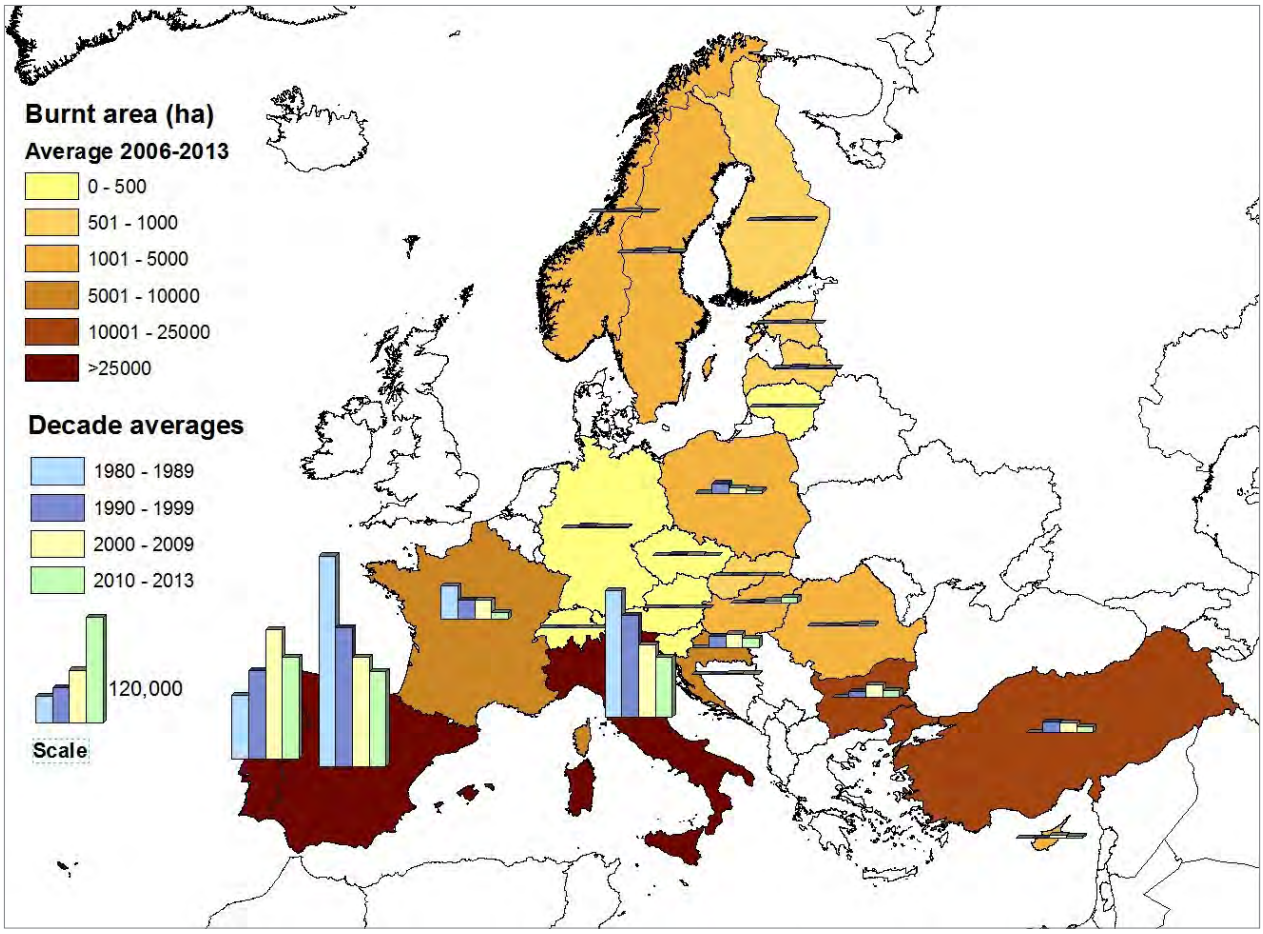

Figure 44. Forest area affected by fire

Storm, wind and snow

Storm damage also poses a serious threat to forests and other wooded land, causing possible losses in relation to timber yield, landscape quality and wildlife habitats. According to a recent study on the impact of storms[1] more than 130 storms have caused notable damage to forests in the current European Union area since 1950, and there are two destructive storms, on average, in Europe each year. In December 1999, catastrophic storm Lothar felled 165 million m^3 of timber, which is equivalent to 43% of the normal annual harvest, mainly in France, Germany, Switzerland and Scandinavia. In 2005, 75 million m^3, equivalent to one year's cutting, were damaged by storm Gudrun in Sweden. The economic consequences of storm damage can be severe. After the storm damage in 2007 (storm Kyrill), the German Forestry Council estimated that some 20 million m^3 of timber had been toppled, which would cost the country's forestry industry approximately EUR 1 billion in lost revenue. In 2009 and 2010, storms Klaus and Xynthia hit forests in France and Germany and caused timber losses totalling approximately 50 million m^3. In the case of badly adapted forest stands, however, the impacts may be considered as less serious than in the case of natural, semi-natural or site-adapted forest stands as the necessary reforestations may lead to site-adapted forests in the future.

For Europe, excluding the Russian Federation, 0.8 million ha (0.5%) of forests were damaged by storm, wind and snow (see Table 24), based on reports from 23 countries covering 73% of the European forest area. The largest proportion of forest area damaged by storms is found in Central-West Europe (1.4%) and South-East Europe (0.8%). In the majority of countries, the area affected by storms was below 1% of the total forest area, while higher proportions were reported for Croatia (2.9%), France (2.5%), Hungary (1.9%), and Ireland (1.1%).

Human-induced damage

Direct human-induced damage factors include harvesting and forest operations, which can cause economic losses and a reduction in the health and vitality of the ecosystems (for example, reduced timber quality, rot, decay, destruction of natural regeneration, soil degradation).

Intensive tourism and recreational activities can also have an impact on forests and other wooded land, causing negative side-effects such as contamination and vandalism. Human-induced damage by unidentifiable causes includes damage from air pollution (see indicator 2.1), traffic and cattle grazing.

Table 24. Storm, wind and snow damage

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	58,636	83	177	0.3
Central-West Europe	30,475	81	429	1.4
Central-East Europe	40,665	93	94	0,2
South-West Europe	18,247	60	62	0.3
South-East Europe	7,864	27	61	0.8
EU-28	135,687	85	794	0.6
Europe	155,887	73	823	0.5

Table 25. Forest operations

Region	Reported forest area (1,000 ha)	Reported forest area (in % of total forest area)	Total forest area with damage (1000 ha)	Percent of forest area damaged (%)
North Europe	30,307	43	56	0.3
Central-West Europe	681	2	1	1.4
Central-East Europe	24,474	56	252	0.2
South-West Europe	n.a.	n.a.	n.a.	n.a.
South-East Europe	1247	4	0	0
EU-28	80,318	50	269	0.3
Europe	56,709	27	299	0.5

[1] http://www.efiatlantic.efi.int/portal/research/storm_european_study/

Damage by forest operations and other human-induced sources was reported by seven countries, which represent 27% of the total European forest area (see Table 25). Approximately 0.5% (299,000 ha) of the reported forest areas was affected by damage caused by forest operations and 7,500 ha by damage caused by other human invention. Given the low response rate, no differences between country groups could be found. The largest proportion of forest affected by damage from forest operations was found in Romania (3.3%). In all other countries the respective damage ranged between 0% and 0.3% of the forest area. Other human-induced damage was found in 7,500 ha and thus represents only a tiny fraction of the total forest area.

Unspecified mixed damage

Unspecified mixed damage was reported by 8 countries representing 35.3% of the total European forest area. A total of 137,000 ha or 0.2% of the reported areas were subject to unspecified damage, which was observed in 5 out of the 8 reporting countries. The affected areas ranged in size from 20 ha (Latvia) to 46,000 ha (Sweden).

Comparison of damage sources

Figure 45 presents a holistic view of the different reported damage sources. Among the individual sources, the leading positions are occupied by damage by insects and diseases and by wildlife and grazing. Favourable climate conditions in the past decade may have had an impact on the abundance of these damaging agents.

The damage caused by fires, forest operations and unspecified mixed damage follows the leading causes at a considerable lag. These forms of damage can be alleviated by human interventions and are thus directly linked to political measures and sustainable forest management practices.

Overall trends in forest damage 1990-2010

No consistent trends could be identified in the extent of the forest areas affected by the different damaging agents between 1990 and 2010. This is mainly due to the small number of countries that provided data for each of the considered points in time (see Table 26).

Table 26 Data made available for the reporting on trends on forest damage

Damage	Number of countries reporting	Reported forest area	
		[1000 ha]	% of total
Insects & Diseases	13	78,155.0	36.8
Wildlife & Grazing	9	50,844.2	23.9
Storm, Wind & Snow	9	60,039.7	28.2
Forest Operations	1	28,073.0	13.2
Human- induced	1	1,938.9	0.9
Fires	22	94,698.6	44.5
Fires human induced*	4	38,857,0	18.3
Unspecified	1	28,073,0	13.2

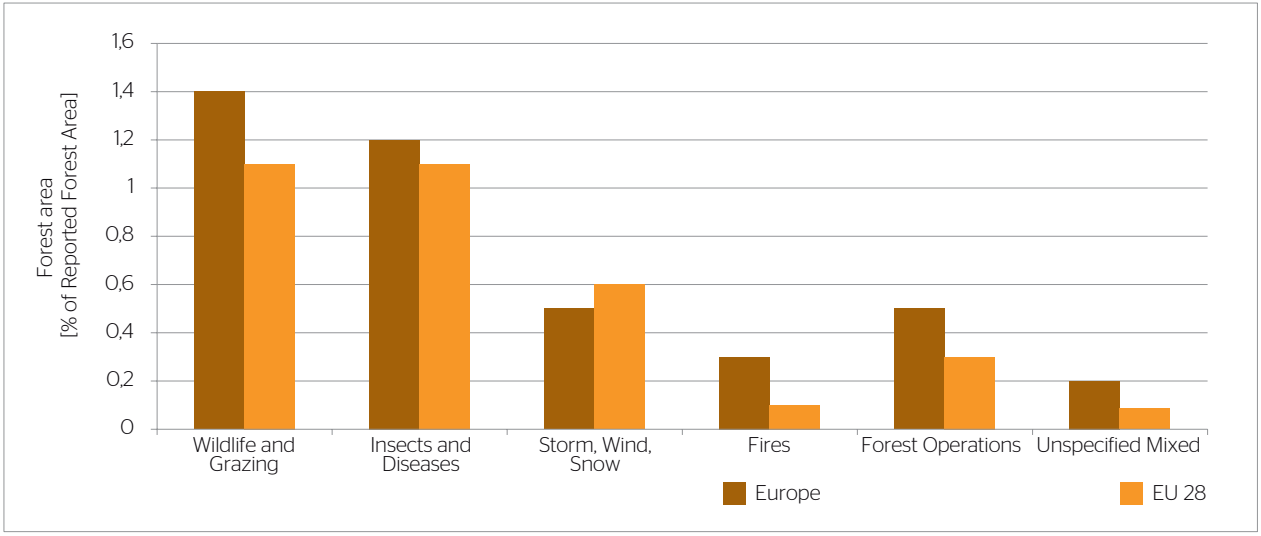

Figure 45. Percentage of forest area affected by damaging agents

As the number of countries reporting observations varies between the survey intervals, the observed changes could be an artefact resulting from differences in the size of national forest area represented in the tables. Therefore, trends are presented only for damage types, for which continuous time series are available for at least 20% of the total European forest area, i.e. insects and diseases, wildlife and grazing, storm, wind and snow, and fires. However, these presentations only reflect part of the actual situation and are highly influenced by the figures reported by individual countries. The presented figures should not be used as a basis for the generation of trends for the entire European forest area.

Figure 46 presents the development of areas affected by different damaging agents for selected countries. Forest areas affected by fire grew slightly between 1990 and 2005 and decreased between 2005 and 2010. A similar but more pronounced development can be seen for areas subject to damage by insects and diseases, for which 13 countries provided a complete time series. The affected areas halved between 1990 and 2010 with a strong decline between 2005 and 2010. This development can be mainly assigned to two countries: the area of forests affected by insects and diseases in Romania decreased from 1.8 million ha in 1990 to 78,000 ha in 2010 and in Portugal from 452,000 ha to 27,000 ha. In contrast, the respective areas increased in Czech Republic, Sweden and Turkey.

The area affected by storm, wind and snow showed a strong increase in 2005. Out of the 9 countries providing a complete data set, this development in Sweden can be explained by the severe damage caused by storm Gudrun in 2005.

9 countries provided data for areas subject to damage by wildlife and grazing for all points in time between 1990 and 2010. The observed increase is driven by Romania where the areas affected by wildlife and grazing increased from 26,000 ha in 1990 to 577,000 ha in 2010.

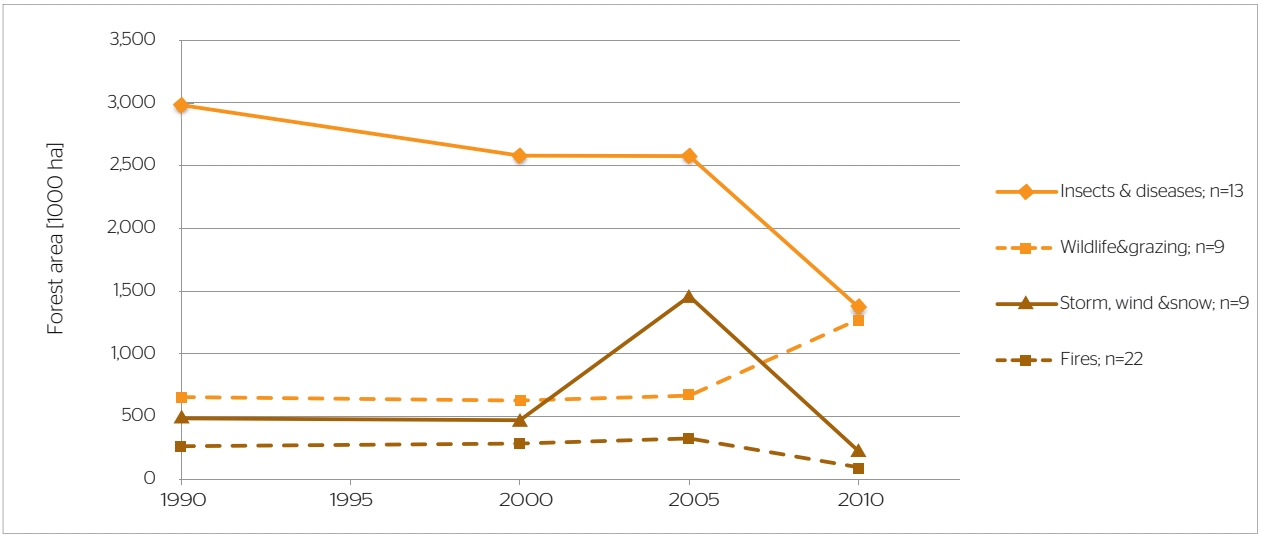

Figure 46. Development of areas affected by different damaging agents for selected countries; n = number of countries

Indicator B3 Health and vitality

Climate change and specific identified risks have led to changes in individual objectives in around 25% of the countries. The major change at EU level is the proposal for a regulation of the European Parliament and of the Council on protective measures against pests of plants (COM(2013)0267)

Status, trends and changes in policy objectives since SoEF 2011

The majority of the countries have specific objectives relating to health and vitality, and around 25% of the countries have adapted their objectives due to climate change and other risks

The majority of the reporting signatories (24 out of 34) reported specifically formulated objectives in relation to health and vitality. Most of the reported changes concern the improvement of the resistance of forests to abiotic and biotic risks (11 countries), forest condition monitoring systems (7 countries), forest fire prevention (5 countries) and climate change mitigation (3 countries).

Nearly one quarter of the reporting signatories (9 of 34) reported changes in their main policy objectives since 2011, for example an increased focus on climate change mitigation (Croatia, Hungary, Romania) or on specific topics like forest fires prevention and elimination (Spain), hunting and game management (Bulgaria), and the monitoring of specific insects (for example, the bark beetle in Finland).

Just a few countries reported on key lessons learnt. Among the lessons highlighted was the need to improve in the use of information on forest fire prevention. This was mentioned by Bulgaria, Cyprus, Montenegro, Spain and Ukraine.

Institutional framework

Continuity of existing institutional frameworks is the main trend

As in 2011, most signatory countries reported "no changes" in the institutional frameworks. Only 7 countries (Belgium, Croatia, Finland, Greece, Latvia, Spain, United Kingdom) reported administrative or institutional changes and they all involved re-organization measures.

Table 27. Stated Objectives on Indicator B3

Maintenance and improvement of the resistance of forests to abiotic and biotic risks	Austria, Cyprus, Finland, Hungary, Slovak Republic, Slovenia, Spain, Sweden, Ukraine, UK, Ireland
Forest fires prevention	Bulgaria, Cyprus, Montenegro, Spain, Ukraine
Atmospheric pollution (air/ozone layer protection)	Croatia and Turkey
Climate change mitigation	Croatia, Norway, Romania
Prevention of illegal logging/harvesting	Bulgaria, Montenegro
Sound balance of requirements for forest protection, game stock density, pasture management, and of private and public interests in forests, taking forest land-use planning into account	Austria, Czech Republic
Improvement of forest condition monitoring	Czech Republic, Hungary, Latvia, Montenegro, Norway, Romania
Improvement of forest condition monitoring with a particular focus on invasive species	Slovak Republic

Legal/regulatory framework and international commitments

Few changes at national level; adoption of the proposal for a regulation of the European Parliament and of the Council on protective measures against pests of plants (COM(2013)0267)

The forest law or act constitutes the main legal basis for forest health and vitality and 21 out of 34 signatories reported "no changes" here since 2011. However, some countries accepted or amended specific regulations on biotic agents/harmful organisms/forest insects and fungi and other causes of damage (e.g. Bulgaria, Finland), illegal logging (Montenegro), forest fire protection (Montenegro, Hungary) and forest monitoring (Latvia, Montenegro).

The adoption of the proposal for a regulation of the European Parliament and of the Council on protective measures against pests of plants (COM(2013)0267) constitutes the major development at EU level.

Financial instruments and economic policy

Continuity since the last reporting period is the main trend

The majority of reporting signatories (26 out of 34) reported "no changes" since 2011.

In most cases, changes in the overall financial instruments/economic policy concerned the entire set of qualitative indicators and were not specifically related to the health and vitality policy area. However, 2 signatories reported specific changes in the financial instruments for forest health and vitality: the European Commission reported changes in the provisions for the management of expenditure relating to the food chain, animal health and animal welfare, and relating to plant health and plant reproduction; Spain reported exceptional funding for forest fires and the implementation of a nematode eradication plan in Extremadura.

Informational instruments

Little improvement in relation to informational means

The majority of signatories (25 out of 34) reported no changes in informational means. However, several countries reported specific developments in relation to forest health and vitality, for example the project on an information system for the forest health and vitality (Bulgaria), the establishment of a new information portal (Croatia and Spain), greater emphasis on close-to-nature preventive management methods (Hungary), and the use of social media to reach a wider audience (Austria).

Criterion 3: Maintenance and Encouragement of Productive Functions of Forests (Wood and Non-woods)

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Data resources: Quantitative Indicators: Indicators 3.1, 3.2, 3.3, 3.4, 3.5: National reports on Joint FOREST EUROPE UNECE/FAO Questionnaire on Pan-European Indicators for Sustainable Forest Management

Qualitative Indicators: Indicators B4, B5: National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator 3.1 Increment and fellings

Increments in European forests substantially exceed fellings

The growth rate of Europe's forests is high. Net annual increment exceeds fellings in all European regions. Due to catastrophic events, mainly storms, fellings were highest in Central-West Europe. The harvesting of wood has increased in Europe since the last reporting period.

Indicator 3.2 Roundwood

Europe remains one of the largest producers of roundwood in the world

The overall value of marketed roundwood is still increasing and reached over EUR 11,500 million in 2010. Europe's forests remain one of the main roundwood producers in the world. Germany, France, and Finland account for 50% of total roundwood removals with a total value of EUR 6,700 million. The reported roundwood value by unit is highly variable between the reporting countries. The demand for woodfuel is increasing at a high rate, especially in some Western European countries.

Indicator 3.3 Non-wood goods

The total value of non-wood goods reported by the countries (26) is almost EUR 2.28 million, of which 73% is accounted for by marketed plant products. The importance of the various non-wood goods differs between the countries; in many cases they can represent an important source of income and employment, especially for the local economies in marginal rural areas.

Indicator 3.4 Services

Biospheric and social services dominate in the reported data. Taking the relatively low number of responding countries into account, the total reported value for marketed services was around EUR 723 million and thus shows a further decrease compared with the EUR 818 reported in 2011 and the EUR 941 million reported in 2007. Due to the incompleteness of the data, it is not known whether this development relates to an actual fall in the marketed volumes of these services, or – what may be more likely – the major variations in the monitoring and reporting of these values.

Indicator 3.5 Forests under management plans

Most forests in Europe have a management plan

A considerable area of over 155 million hectares in the reporting countries is covered by forests under management plans or equivalents. This represents almost 15% of European forest area, or over 70% of continent's forests. Substantial differences exist, however, in the extent, form, content and importance of these tools across the continent. The change rate of forests covered by management plans or equivalents has been slightly increasing by around 1% per year since 1990.

Qualitative Indicators

Indicator B4 Production and use of wood

Two thirds of the reporting countries had targets for increasing production of domestic wood in the context of SMF and a few of them (6 of 34) reported explicit new targets for the increased use of wood, notably in the bioenergy sector.

The implementation of the FLEGT Action Plan and the EU Timber Regulation and the greater emphasis facilitating the incorporation of private forest owners into active management were reported as the main drivers of institutional change,

While financial instruments in relation to wood production and use remained largely stable, almost one third of the reporting signatories (10 out of 34) reported changes in the informational means used in relation to the production and use of wood (i.e. among other things, a register of forest owners or a central register for due diligence).

Indicator B5 Production and use of non-wood goods and services, provision of specially recreation

Although the majority of countries reported no changes, almost one quarter reported changes in the main policy on the production and use of non-wood goods and services (mostly in terms of improving the quantification of the attention paid to them).

Forest law is the main legal instrument for regulating non-wood forest products, and the majority of the countries reported continuity in the use of existing legal or regulatory, financial and informational means in this particular field.

Indicator 3.1 Increment and fellings

Introduction

Although additional information about age class distribution, or even better diameter class distribution, is needed to correctly assess forest management in Europe, the balance between net annual increment (NAI) and annual fellings is traditionally one of the most frequently used criterion for assessing the sustainability of forests. The relation between increment and fellings is decisive for the current and future availability of wood and for shaping a stable growing stock. Fellings should not exceed increment in the long run. From a mid-term perspective, forest management may still be sustainable if fellings exceed increment. As timber markets are volatile, growing stock surpluses aggregated during weak market periods can be utilised under prospering market conditions without undermining the principle of sustainability.

Concerns about greenhouse gas emissions have led to an increasing demand for wood biomass as a renewable energy source, while the transition to a market economy in Eastern Europe stimulated the production of processed forest products. As a consequence of the increasing timber demands, the proportion of the increment that is utilised may be expected to increase in the future.

Status

Increment is specified as NAI, which is defined as the average annual volume over the given reference period of gross increment (i.e. the total increase of growing stock during a given time period) minus that of natural losses of all trees to a minimum diameter at breast height (DBH) of 0 cm. If fellings are lower than the net increment, the growing stock is increasing (see Figure 47 and Table 28). Part of the fellings remains in the forest as logging losses (e.g. stem sections with defects or branches) and are not utilised for energy or wood products.

The volume of wood harvested in 2010 was lower in general than NAI, albeit with significant variations between the European countries and regions.

Table 28. Net annual increment and fellings by region 2010

Region	Net Annual Increment		Fellings	
	millionm^3	m^3/ha	millionm^3	m^3/ha
Central-East Europe	181.7	4.1	112.7	2.6
Central-West Europe	273.4	7.2	185.7	4.9
North Europe	247.0	3.5	194.6	2.7
South-East Europe	69.6	2.4	43.5	1.5
South-West Europe	68.0	2.2	45.8	1.5
EU-28	720.6	4.5	522.3	3.3
Europe	839.7	3.9	582.3	2.7

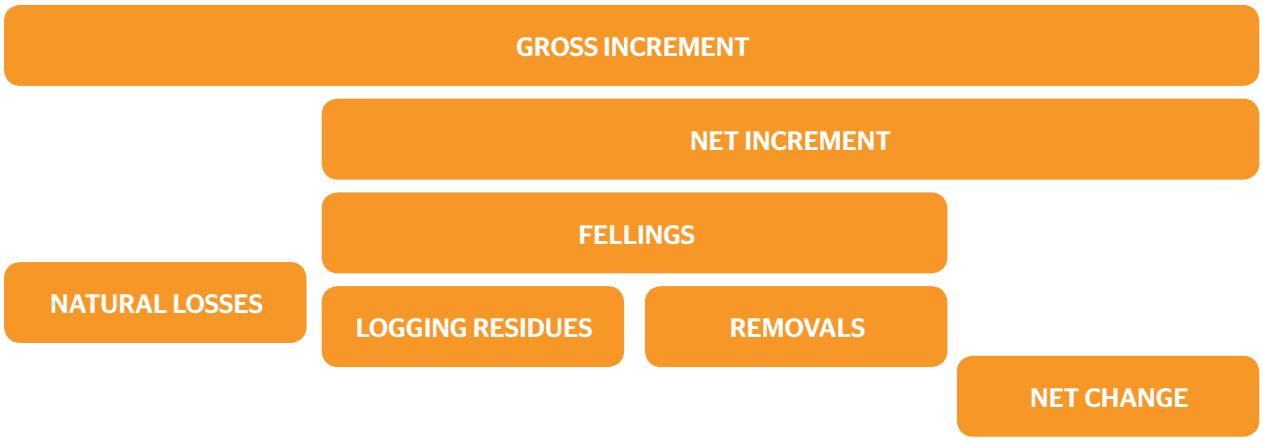

Figure 47. Components of gross increment and drain

The net annual increment for 2010 in European countries amounts to approximately 839.7 million m^3. 33 countries covering 64% of the European forest area available for wood supply reported on their NAI for 2010. The Central-West Europe and North Europe regions together account for around 72% of the total increment. At country level, Germany, Finland, France and Sweden reported the highest absolute value for NAI (Figure 48). Germany, Denmark and Ireland show the highest per hectare NAI, which exceeds 10 m^3/ha. Approximately 582 Million m^3 of fellings were reported for all of Europe in 2010. 38 countries reported an NAI for 2010 that corresponds to 68% of the European forest area available for wood supply. North Europe and Central-West Europe are the regions with the largest volume of fellings and account for around 65% of total fellings in the entire European area.

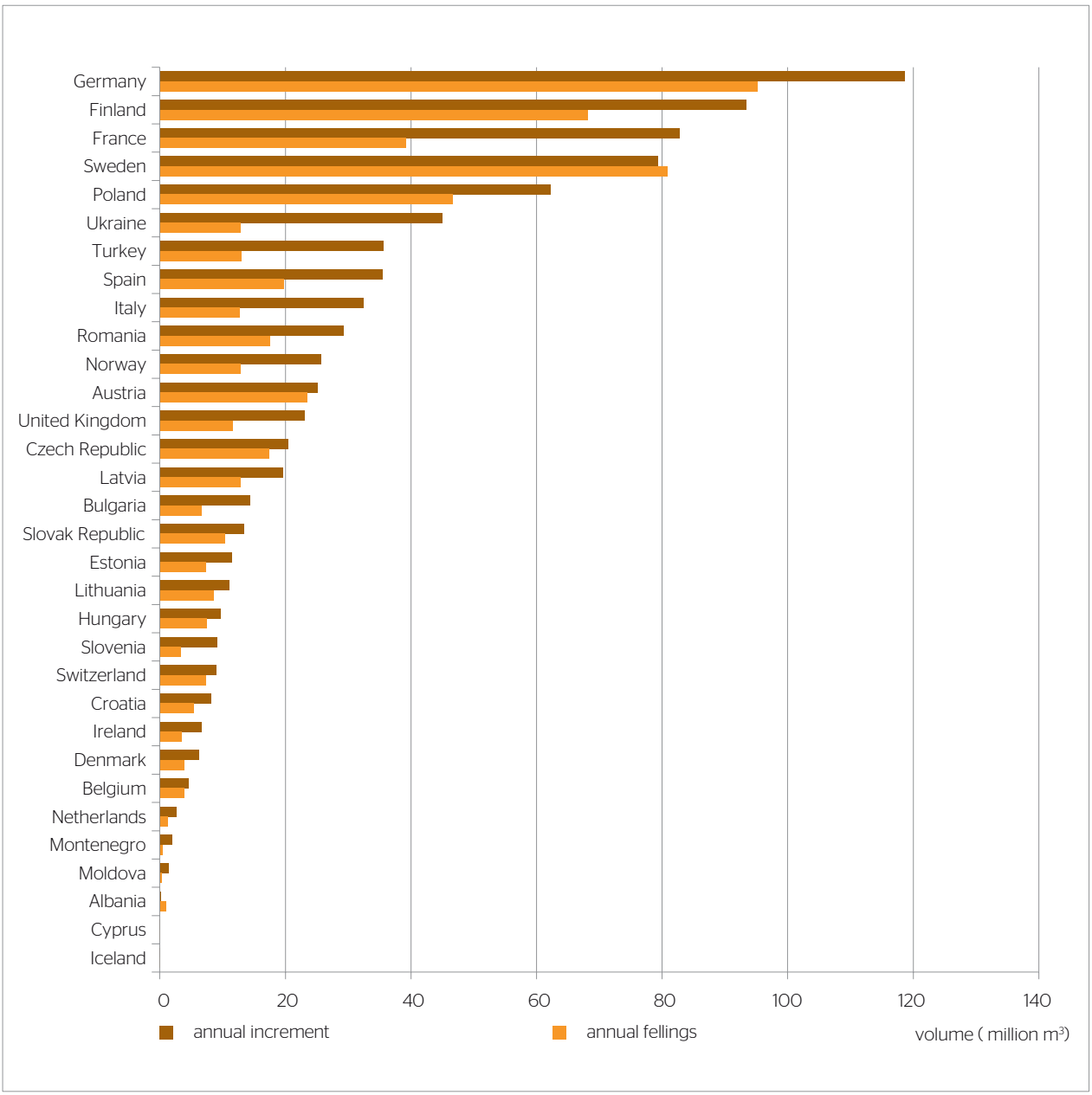

Figure 48. Annual fellings and annual increment for reporting countries in Europe (million m^3)

Felling rates present the proportion of increment that is utilized by fellings. Table 29 presents the felling rates for 32 European countries representing 64% of the Forest Europe area, for which both data on NAI and fellings were available for 2010. Figure 50 presents the geographical distribution of the felling rates across Europe.

The analysis of felling rates highlights major differences between the countries of the European area. Higher rates are found in Central-West and North Europe.

With the exception of Sweden, fellings did not exceed the NAI in any of the 32 reporting countries. Approximately 66% of the NAI is utilized by fellings. The highest felling rates are reported for Sweden (102%) and Austria (94%). The lowest rates among countries with a consistent forest area were reported for Ukraine (29%), Turkey (37%) and Italy (39%).

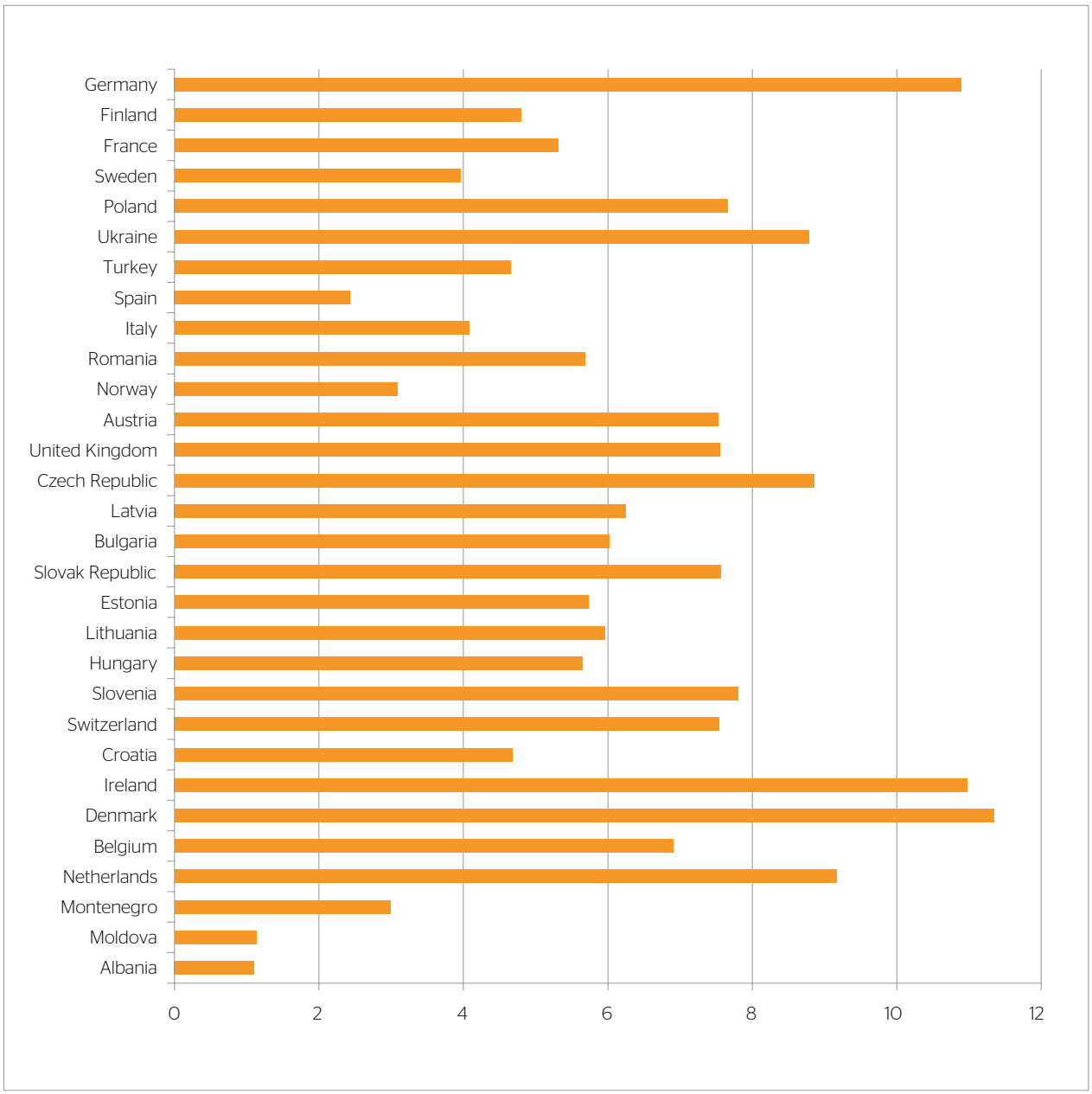

Figure 49. Annual increment per hectare for reporting countries in Europe (m^3/ha)

Sweden and Austria have experienced catastrophic storms in the past decade, which resulted in high natural losses and the consequent removal of downed timber as well as reductions in the NAI. Utilisation rates greater than 100% could still be sustainable under these conditions.

In the 32 reporting countries, at least, it would be possible to mobilise a substantial amount of timber by increasing fellings still maintaining sustainable forest management.

Table 29. Felling rates for 32 countries in the European regions that reported both NAI and fellings for the year 2010

Country	Felling rates (%)
Central-East Europe	62.3
Central-West Europe	68.1
North Europe	78.8
South-East Europe	42.0
South-West Europe	47.7
EU-28	70.5
Europe	66.2

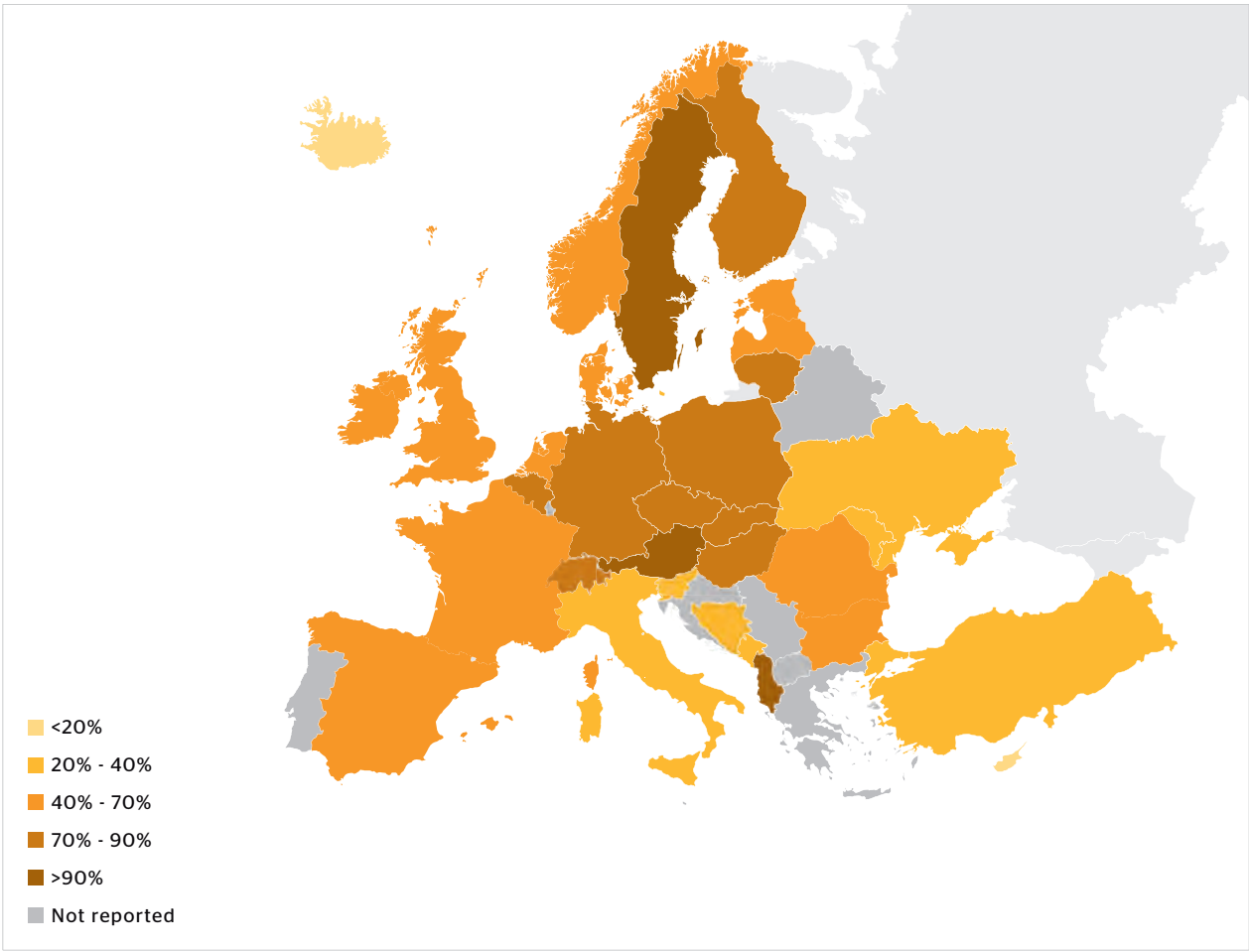

Figure 50. Geographical distribution of felling rates for the countries, for which both data sets were available for the 2010 reporting year

Trends

18 countries provided complete series for the NAI and fellings for all four reporting years (1990, 2000, 2005 and 2010). Those countries represent approximately 25% of the European forest area.

23 countries reported their NAI for all four years, covering the 35% of the European forest area. In those countries, the NAI increased by approximately 2.7 million m^3 per year since 1990 (see Table 30).

24 countries reported on fellings for all four reference years, covering the 35% of the European forest area. Fellings in the reporting countries (see Table 31) increased continuously since the 1990s (around 2.4 million m^3 per year). However, the average annual change over the three periods decreased from 1990. It declined from 3.2 million m^3 per year for the period 1990-2000 to 0.5 million m^3 per year for the period 2005-2010. Between 2005 and 2010 fellings were slightly reduced in South-East Europe and North Europe alone.

Between 1990 and 2010 the felling rates remained considerably below 100% (see Table 32) in Europe. However, they increased slightly from 60% in 1990 to 64% in 2010. The greatest variability in fellin grates over time can be found in the North Europe.

Table 30. Trend in net annual increment at regional level for the European countries with data available for each reporting year (23 countries reporting on NAI)

Region	Net Annual Increment						
	Subtotals (million m^3)				Annual change (million m^3/yr)		
	1990	2000	2005	2010	1990-2000	2000-2005	2005-2010
Central-East Europe	114.1	114.2	118.5	119.4	0.0	0.9	0.2
Central-West Europe	50.8	57.4	55.1	56.2	0.7	-0.5	0.2
North Europe	111.6	123.0	132.5	136.9	1.1	1.9	0.9
South-East Europe	25.6	29.9	31.2	31.9	0.4	0.3	0.1
South-West Europe	56.5	62.3	65.1	68.0	0.6	0.6	0.6
EU-28	291.3	315.1	329.1	340.1	2.4	2.8	2.2
Europe	358.6	386.8	402.5	412.6	2.8	3.1	2.0

Table 31. Trend in annual fellings at regional level for the European countries with data available for each reporting year (24 countries reporting on fellings)

Region	Fellings						
	Subtotals (million m3)				Annual change (million m3/yr)		
	1990	2000	2005	2010	1990-2000	2000-2005	2005-2010
Central-East Europe	42.7	43.6	50.8	52.9	0.1	1.4	0.4
Central-West Europe	31.5	32.1	39.7	40.4	0.1	1.5	0.1
North Europe	80.3	111.8	105.9	105.2	3.2	-1.2	-0.2
South-East Europe	16.3	16.1	19.0	18.6	0.0	0.6	-0.1
South-West Europe	44.9	43.9	44.9	45.8	-0.1	0.2	0.2
EU-28	199.4	233.0	245.5	248.4	3.4	2.5	0.6
Europe	215.7	247.4	260.4	262.9	3.2	2.6	0.5

Table 32. Trend in felling rates

Region	Felling rates (%)			
	1990	2000	2005	2010
Central-East Europe	37	38	43	44
Central-West Europe	62	56	72	72
North Europe	72	91	80	77
South-East Europe	63	54	61	58
South-West Europe	80	70	69	67
EU-28	68	74	75	73
Europe	60	64	65	64

Indicator 3.2 Roundwood

Introduction

Roundwood comprises all wood obtained from removals, including wood recovered from natural, felling and logging losses. Roundwood can be sub-divided into industrial roundwood (wood in the rough), which is mainly used for construction and processed timber products, and woodfuel, which is increasingly important as a source of renewable energy. Roundwood production acts as an interface between the forestry and the timber sector: it provides income for forest owners, serves as a resource for the timber sector and its added-value, and contributes to the economy, especially in rural areas.

Only a few countries assessed the removal of wood fuel on a representative scale. It is widely accepted that a considerable amount of woodfuel is utilized for self-consumption and thus enters neither the markets nor statistical records. The figures presented in the following paragraphs may reflect such a bias and underestimate the total removals of wood fuel from forests.

Status

Information on total roundwood production was provided by 38 countries, representing 60% of the forests in the Forest Europe area.

For 2010, a total of 407 million m^3 of roundwood removals was reported, 140 million m^3 of which were located in Central-West Europe and 144 million m^3 in North Europe (see Table 33). The highest total removals of roundwood at country level occurred in Sweden (70 million m^3), France (54 million m^3), Germany (53 million m^3) and Finland (48 million m^3). Removals per hectare of Forest Available for Wood Supply (FAWS) ranged from 4.4 m^3/ha in Central-East Europe to 1.1 m^3/ha in South-West Europe.

20 countries reported data on the value of total removals for 2010 (see Table 33), representing 54% of the Forest Europe area. The value of roundwood removals amounts to EUR 18,237 million. The highest value was reported for Germany (EUR 3,277 million), Sweden (EUR 2,801 million) and France (EUR 2,980 million). The value reported for Central-West Europe

Table 33. Volume and value of total roundwood removals at regional level for European countries with data for the reporting year 2010 (20 countries reporting both volume and value)

Region	Volume [1 000 m^3]	Volume [m3/ha FAWS]	Value [EUR million]	Value [EUR/ha FAWS]
Central-East Europe	83,195	4.4	2,981	182.7
Central-West Europe	140,002	4.3	7,560	215.9
North Europe	143,861	3.1	5,719	115.8
South-East Europe	24,204	2.7	1,158	129.9
South-West Europe	15,610	1.1	818	56.2
EU-28	356,343	4.0	16,627	181.6
Europe	406,873	0.6	18,237	26.4

Table 34. Proportion of marketed roundwood with respect to total removals at regional level for European countries with data for the reporting year 2010 (13 countries reporting both volume and value)

Region	Proportion of marketed roundwood (%)
Central-East Europe	86.2
Central-West Europe	80.5
North Europe	92
South-East Europe	100
South-West Europe	100
EU-28	87.7
Europe	85.8

(EUR 7,560 million) is well above the values reported for the other regions. The value of wood removals varied between EUR 56/ha (South-West Europe) and EUR 216/ha (Central-West Europe).

The above-presented figures relate to the total removals and do not take into account whether the removals were actually marketed or not. 15 countries (representing 40% of the European forest area) provided data on marketed roundwood, i.e. roundwood sold on markets. Marketed roundwood excludes roundwood harvested for self-consumption (subsistence) and other forms of use that do not involve market transactions.

Table 34 presents the proportion of marketed roundwood as a share of the total removals by region. On average, 86% of the total removals were marketed. The lowest proportion was found in the Central-West European region. Here, 20% of the total removals did not enter the markets. In all other regions the percentage of marketed removals was well above 90%. In the South-West and South-East Europe regions, for which two countries provided data, the entire removals were reported as being marketed. The figures in Table 34 need to be interpreted with care, particularly because removals of wood fuel are not well monitored in all countries and could give rise to a bias in the estimation of the marketed roundwood.

Trends

The trend identified in total marketed roundwood is based on 12 countries, representing approximately 34% of Europe (see Table 35).

Between 1990 and 2010 removals increased by approximately 75 million m^3, with a high in 2005 (454 million m^3) due to sanitary fellings and the removal of downed trees after heavy storms in the late 1990s. Between 1990 and 2010 the level of removals per ha was maintained in all European regions except the Central-East region where a consistent rise from 3 m^3/ha in 1990 to 4.3 m^3/ha in 2010 was reported. The value of removals increased steadily in all regions.

Table 35. Trend in the period 1990-2010 for the total volume of roundwood in the European countries with data available for each reporting year (12 countries reporting)

Region	Total roundwood															
	Volume [1000 m^3]				Volume [m^3/ha FAWS]				Value [million €]				Value [€/ha FAWS]			
	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
North Europe	116,675.6	155,022.3	165,458.1	155,290.2	2.0	2.7	2.9	2.8	4,636.1	4,712.3	4,939.8	5,293.3	88.6	94.1	100.4	109.4
Central-West Europe	141,227.5	135,465.4	152,947.4	147,369.9	4.3	3.9	4.3	4.1	5,627.2	5,813.4	6,559.7	7,532.2	181.4	180.2	198.3	224.4
Central-East Europe	59,224.4	65,652.4	78,034.7	81,226.3	3.0	3.4	4.0	4.3	160.7	143.9	207.3	264.0	105.0	88.7	123.1	152.6
South-West Europe	25,838.2	24,204.0	26,217.2	25,821.0	4.6	4.1	4.8	4.8	690.7	688.7	757.5	818.4	0.0	0.0	0.0	0.0
South-East Europe	26,487.0	29,075.2	31,469.8	34,799.2	1.6	1.6	1.7	2.1	983.2	689.1	698.9	996.7	113.6	79.7	80.2	129.9
EU-28	335,035.4	373,982.9	418,023.2	404,548.1	2.9	3.0	3.2	3.4	10,640.4	10,992.8	12,075.7	13,455.9	93.1	90.2	95.7	112.3
Europe	369,452.6	409,419.3	45,412.71	444,506.5	3.1	3.2	3.6	3.6	12,097.9	12,047.5	13,163.1	14,904.6	97.7	88.5	100.4	123.3

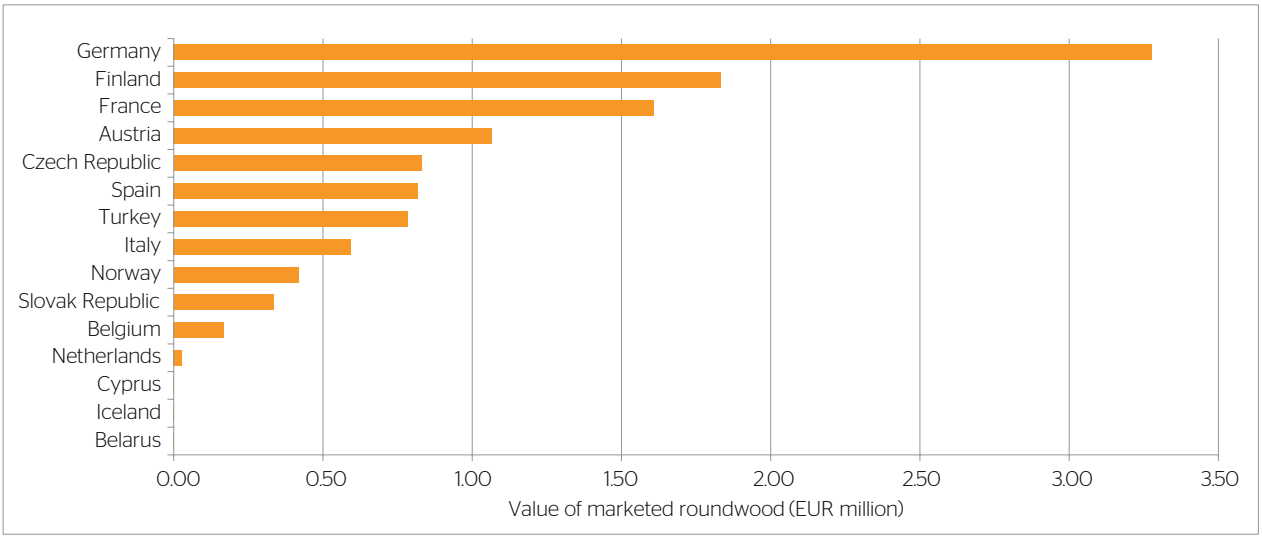

Figure 51. Value of marketed roundwood for European countries in 2010

Indicator 3.3 Non-wood forest goods

Introduction

Temperate and boreal forests are a traditional source of not only wood but also many other products that are extracted from forests, including resin, tannin, fodder, litter, medical and aromatic plants, fruits, nuts, roots, mushrooms, seeds, honey, ornamentals and exudates. Until the recent past, forest sites in many parts of central and southern Europe became subject to nutrient imbalance due to the use of forests for grazing and litter extraction. Over time the utilization of non-wood products became marginalised as management objectives shifted to wood production. This shift was driven by different processes: the increasing estrangement of local people due to the growing disregard for subsistence use and small-scale rural industries, technological substitution, the domestication and intensification of agricultural production, and growing imports from non-European countries. Today, however, the value of forest products other than wood is being rediscovered on account of both their price dynamics and the increased demand associated with tourism and recreation.

The socio-economic contribution of forests to livelihoods and the impact of their use on the environment are essential components of modern concepts for sustainable forest management. However, the integration of the assessment of Non-Wood Goods (NWGs) in extensive forest surveys causes problems as most NWGs are site-specific, dependent on spatial distribution and may be of solely local importance.

This indicator covers the value and quantity of marketed NWGs from forest and other wooded land. For reasons of consistency, even if they could represent a substantial part of the total harvested NWGs, NWGs harvested for self-consumption and informal use at local level are excluded from the analysis. The main NWGs identified in the available data sets are: Christmas trees, mushrooms and truffles, fruits and berries, cork, ornamental plants, medicinal and colorant products, seeds of forest tree species, game products and honey.

Status

Quantities and/or values for marketed NWGs were provided by 28 countries. For food and ornamental plants the reported forest area amounts to 61% and 36% respectively; for all other categories of NWGs the reported forest area is far smaller. The available data sets are fragmentary for several reasons: the parameters use to assess quantity are not harmonised and render it difficult to compare data; in addition, the collection of data on NWGs is costly, the number of products is very large and no commonly accepted classification and priority list of NWGs are used by national statistical offices, including for the local significance of many products. For these reasons, it can be difficult to obtain an overview and comparable data for all types of NWGs across Europe. Nevertheless, the reported data clearly show that NWGs can be an important source of income at local level (see Figure 52 and Table 36).

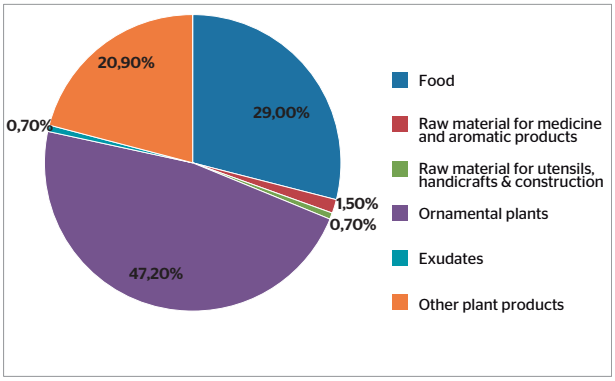

Figure 52. Shares of total reported value of marketed NWGs accounted for by plant products (in percent)

Table 36. Value of marketed NWGs: marketed plant products

Region	Plants	Animals	Total
	[1,000 €]		
North Europe	237,569	8,603	246,172
Central-West Europe	717,527	337,052	1,054,579
Central-East Europe	42,886	22,933	65,819
South-West Europe	609,282	197,918	807,200
South-East Europe	51,511	51,724	103,235
EU-28	1,592,080	55,6119	2,148,199
Europe	1,658,775	618,229	2,277,004

Due to the differences in the reference units reported (e.g. weight, volume, number) the following remarks relate not to the quantity but value of NWGs. The total value that was reported for NWGs is almost EUR 2,277 million for the entire Forest Europe region. Of this sum, EUR 1,659 million is accounted for by marketed plant products and EUR 618 million by marketed animal products. The need for further processing differs significantly between individual NWGs; as a result, for some products, the marketed value of NWGs generates only marginal income for the forest managers as most of the marketed value is related to processing.

Ornamental plants (47%), food (29%) and other plant products (21%) are the three categories of NWGs by a considerable margin, for which the highest total values were obtained. In 2010, the reported values for these NWGs represented 97% of the total value of NWGs.

The highest shares in the value generated by NWGs were reported by the Central-West (EUR 1,054 million), South-West (EUR 807 million) and North Europe (EUR 246 million) regions. The lowest shares are reported for the South-East (EUR 103 million) and Central-East (EUR 66 million) Europe regions.

Information on the quantity of food was reported by 16 countries, and on its value by 18 countries. In the overall NWG reporting, food accounted for a total of 236,000 tonnes in weight and EUR 482 million in value. The main producers in quantitative terms were Italy (44,600 tonnes), Spain (42,100 tonnes) and Turkey (22,700 tonnes). In terms of value, the main producers were Spain (EUR 196 million), Italy (EUR 88 million), and Portugal (EUR 55 million).

Data on "ornamental plants" were provided by 15 countries. The total value of this category comprised approximately EUR 78 million. Among the reporting countries, the highest values were generated for decorative foliage in Germany (EUR 500 million) and Denmark (EUR 141 million).

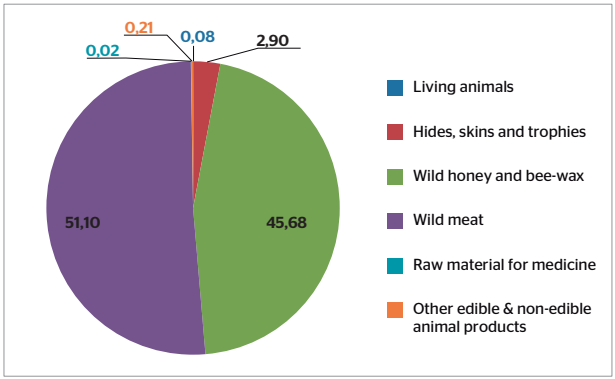

Figure 53. Shares of total value of marketed NWGs accounted for by animal products; absolute values specified in EUR 1,000

Figure 53 shows the share of total marketed values accounted for by marketed animal products. The highest share is reported by Central West-Europe and South-West Europe (around EUR 618 million each). Table 37 presents the quantity and value of different types of marketed animal products.

Game comprises all hunted birds and mammals, such as partridge, pheasant, hare, deer, wild boar and chamois. The presented figures include game species whose habitats are forest-related or forest-dependent. Game that roams on farms is excluded. Data on game meat was reported by 10 countries in relation to quantity and 14 countries in relation to value. The commercial sale of game meat is an important economic activity in many countries. Among the reporting countries, Germany (EUR 195 million) Spain (EUR 73 million) and Austria (EUR 15 million) were by far the highest producers of game meat in terms of value. Finland and Sweden did not provide data on game meat. Among the reported value of non-wood products, game accounted for EUR 321 million (14% of NWGs) for all responding Forest Europe countries.

Table 37. Quantity and value of different types of marketed animal products

Region	Game meat		Living animals		Pelts, hides skins and trophies		Wild honey and bee-wax		Rawmaterial for medicines, colorants		Other animal products
	Quantity tonnes	Value 1,000 €	Quantity pieces	Value 1,000 €	Quantity pieces	Value 1,000 €	Quantity Tonnes	Value 1,000 €	Quantity Tonnes	Value 1,000€	Value 1,000€
North Europe	3,117	7,147	-	-	59	529	141	780	20	147	-
Central-West Europe	9,227	217,113	-	-	287	6,738	15,750	111,861	-	-	1,340
Central-East Europe	10,084	17,959	7	528	10	4,445	-	-	-	-	-
South-West Europe	-	73,228	-	-	-	-	36,199	124,690	-	-	-
South-East Europe	700	5,565	-	-	4	6,537	554	39,623	-	-	-
EU-28	23,080	317,013	7	528	351	3.312	52,090	237,330	20	147	1,340
Europe	23,127	321,012	7	528	361	18,249	52,644	276,953	20	147	1,340

Honey and bee-wax production was mentioned by 9 countries in relation to value and 6 countries in relation to quantity. The total value of marketed honey and bee-wax amounted to EUR 277 million. The other categories of marketed animal products contributed less than 2% to the total value generated by NWGs.

The increasing importance of the NWG sector is confirmed by the import patterns for most FOREST EUROPE countries and the re-emergence of some products (like resin, tannin, pine nuts) that had been marginalized in the European forest economy until recently. However, this increase in the value of NWG production is partly an artefact due to a change in assessment activities. Thus, while import and consumption trends are quite clear, no clear trend for NWG production can be reported based on the collected data.

In view of the fragmented reporting and low response rates, the presented figures cannot be considered as representative for all of Europe or for the different categories and must be interpreted as minimum values for the financial benefits generated from NWGs.

Table 38. Average value of the marketed services per hectar for countries that reported positive values for the various services

Region	Game meat Value €/ha	Living animals Value €/ha	Pelts, hides skins and trophies Value €/ha	Wild honey and bee wax Value €/ha	Raw material for medicine, colorants Value €/ha	Other animal products Value €/ha
North Europe	0.92	-	0.04	0.23	0.07	-
Central-West Europe	13.3	-	1.75	3.53	-	0.35
Central-East Europe	1.59	0.27	0.53	-	-	-
South-West Europe	4.01	-	-	5.8	-	-
South-East Europe	0.83	-	0.97	9.18	-	-

Indicator 3.4 Other marketed forest ecosystem services

Introduction

Europe's forests provide numerous ecosystem services of benefit to the public, e.g. through their role in the global carbon cycle, the protection of infrastructure and biodiversity. Forests provide recreational options of significant value in the more populated areas of Europe. Some of these forest ecosystem services are the basis of marketed products and services and generate financial revenues, while others represent the non-marketed side-effects of forest management, i.e. externalities, the value of which is enjoyed by people but not reflected in market transactions. In this section we only address marketed ecosystem services that are forest-dependent or mainly forest-related and can be marketed by forest owners or others, to the extent these have been reported on by states.

There are five categories linked to indicators in the Forest Europe framework. Marketed ecological services include those related to Indicators 5.1 and 5.2 (soil, water and other environmental functions as well as infrastructure and managed natural resources), which are often on a voluntary contractual basis with compensation or other payments from private or public bodies. Marketed biospheric services include services related to Indicator 4.6 (*in-situ* or *ex-situ* gene conservation of genetic resources) and Indicator 4.9 (protected forest area), e.g. nature protection on a voluntary contractual basis with compensation or other payments from private or public bodies. This may include some NATURA 2000 sites. Nature protection contract schemes are increasingly discussed and applied as a measure for the promotion of ecological services of forests. Marketed social services include hunting and fishing licenses, the renting of huts and houses, forest-based leisure, sports, and outdoor activities, and educational activities that are not free of charge to the consumers (e.g. public and schools). Please note that the value of recreational services that are not exchanged via market transactions is not reported, however it represents a very significant amount in all likelihood. Amenity services include those related to spiritual, cultural and historical functions, e.g. sacred, religious or other forms of spiritual inspiration, sites of worship, landscape features (mountains and waterfalls), 'memories" in the landscape from past cultural ties, aesthetic enjoyment and inspiration, and historical artefacts. Other marketed services include payments to woodland owners for licenses that regulate land use for gravel extraction, telecommunication masts, wind farms and electricity distribution, among others. Depending on national laws, these marketed services of the forest may add directly to the income of forest owners and thus contribute to the economic viability of sustainable forest management.

Status and scales

Data on the value of marketed services categorized in the 5 categories remain scarce in country reports. Data for 2010 were reported by only 14 countries, and for only some of the categories in most cases. Figure 54 presents the proportion of marketed services provided by the reporting countries. Methodological difficulties undoubtedly arise in quantifying the value of marketed services. Although the marketed forest-related services are well identified, the volume of income derived from these services is not known or registered, or covers only part of the forest sector (e.g. private versus public ownership). As we can see, the biospheric and social services dominate the reported data as does the residual category of 'other services'.

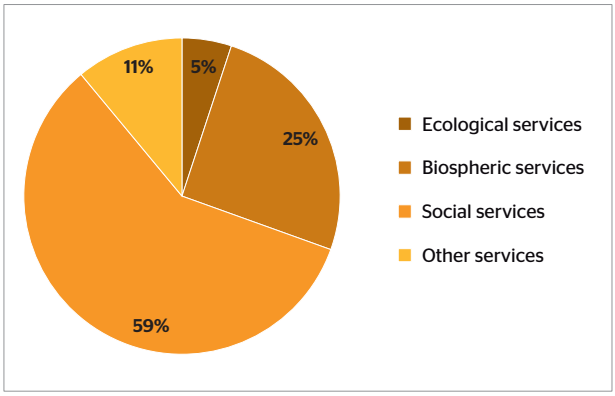

Figure 54. Proportion of marketed services provided by the reporting countries

The best documented marketed services are hunting and fishing licenses, however, even here, data are missing from several countries. About half of the reporting countries provided data on hunting licenses and other hunting related incomes, which constitute one of the most important traditional services. Hunting licenses and related products can be a source of significant income for private and public landowners. The rates and demand for ancillary products like hides and meat vary considerably across Europe and may depend, among other factors, on the location and attractiveness of the hunting grounds and on local food consumption traditions. The total reported value for marketed services, considering the relatively few responding countries, was around EUR 619 million and thus shows a further decrease in comparison to the EUR 818 million reported in 2011 and the 941 million reported in 2007. Due to the incompleteness of the data, it is not known whether this development relates to an actual fall in the marketed volumes of these services, or – what is, perhaps, more likely – the large variations in the monitoring and reporting of these values.

Due to the incompleteness of the data, all of the figures presented for this Indicator are very conservative and likely to underestimate the true gross values considerably – perhaps by an order of magnitude.

Taken at face value, the total sum of EUR 619 million/year reported here suggests that the average income per hectare and year from all of these services is significantly less than EUR 1/ha and year across Europe. However, by focusing on the countries that have reported positive values and the volumes of the different marketed services, it is possible to calculate the figures shown in Table 39, in which the average marketed value per hectare and year is reported across country groups for these countries only.

Table 39. Total quantities and values for other marketed forest ecosystem services reported by country groups

Region	Total reported across services Value 1,000€
North Europe	171,118
Central-West Europe	204,864
Central-East Europe	185,582
South-West Europe	29,636
South-East Europe	22,215
EU-28	546,341
Europe	619,415

Indicator 3.5 Forest under management plans

Introduction

Forest Management Plans (FMP) and equivalent documents, such as guidelines for various administrative levels, are major tools for the implementation of sustainable forest management over extended periods of time. They make it possible to address all of the economic, social and environmental functions of forests and ensure a proper balance between the multiple functions and services of forests at the operational level. They are written forest management schemes that require periodic revision. According to Forest Europe, FMPs comprise information available in various formats (text, maps, tables and graphs) and collected during periodic forest inventories at operational forest units level combined with operations planned for individual stands or compartments to achieve management goals, while equivalents consist of information collected on forest area, at forest management or aggregated forest management unit level, together with strategies/management activities planned for the attainment of the management or development goals. The underlying concept and implementation of management plans vary considerably among and within countries. Some countries consider management plans as both formal and informal.

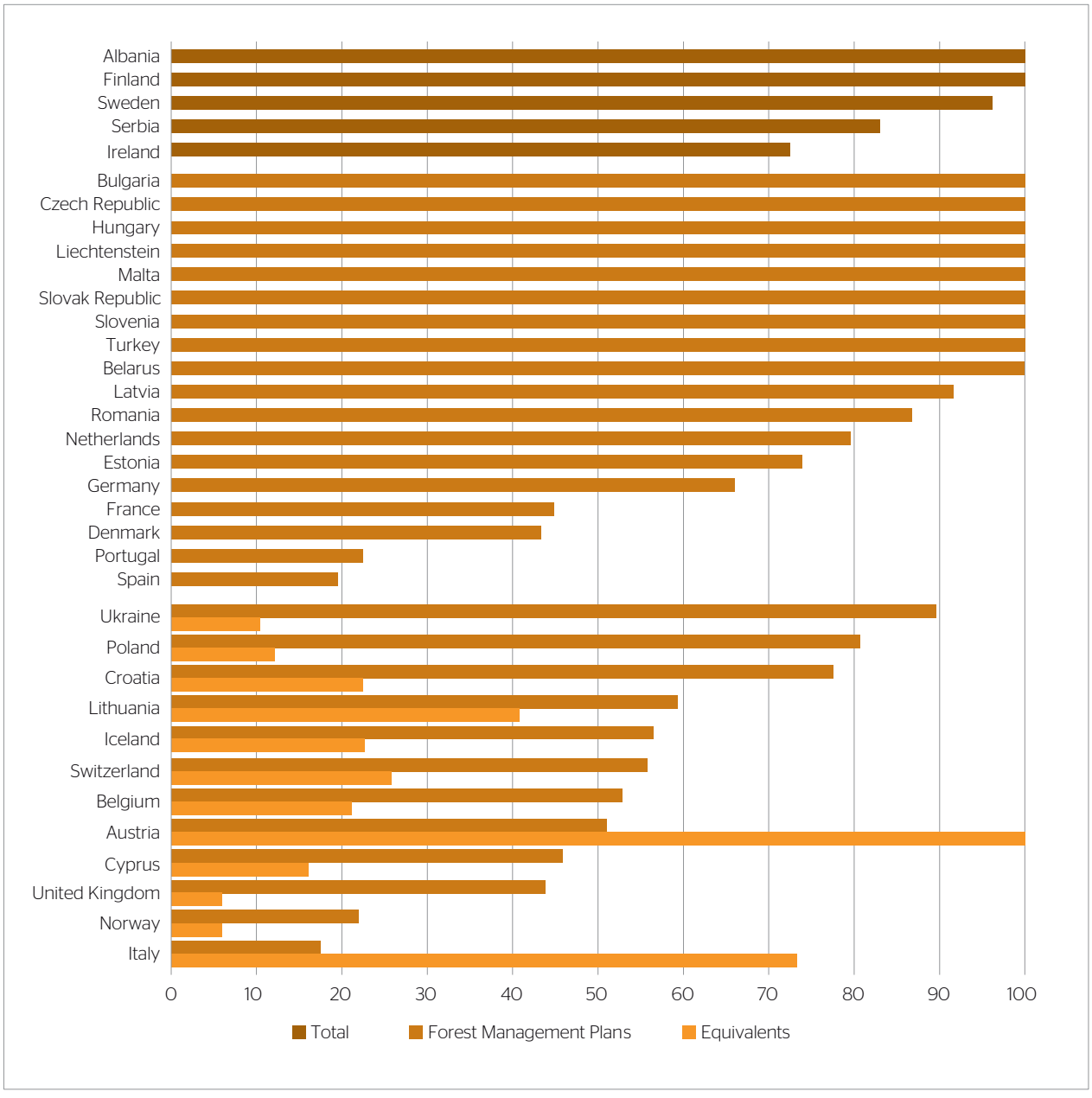

Figure 55. Percentage of forest area under Forest Management Plans or equivalents in the European countries with data available for the 2010 reporting year

Situation

In 2010, a total of 35 countries reported the area of forests under management plans or equivalents at a total of over 155 million hectares, representing nearly 15% of European forest area or over 70% of European forests. As many as 8 reporting countries have forest management plans for all their forests: Belarus, Bulgaria, Czech Republic, Hungary, Liechtenstein, Malta, Slovak Republic and Turkey, and 4 more have forest management plans or equivalents for them, i.e. Austria, Croatia, Lithuania and Ukraine. Figure 55 shows the share of area under management plans or equivalents by country. Countries like Albania, Finland, Ireland, Serbia and Sweden provided data without making any distinctions between the different document types. The data from Southern regions were most scarce. The importance of the various documents varies in different parts of Europe. Forest management plans are more prevalent across the reporting counties while equivalents are more common in Northern Europe and in some countries of the South-West region. The share of forests under management plans or equivalents does not depend on the ownership structure. Countries with predominantly public forests (>90%) usually have management plans or equivalents for all their forests. On average, countries in transition, and countries in which forestry is traditionally of greater economic importance, e.g. Finland and Sweden, have a higher proportion of forests under management plans than the rest of Europe. The exception is Latvia where the contribution of forestry to gross domestic product is 3.3% (>8 times the average in Europe), but the forests under management plans and equivalents represent less than 30% of the country's total forest area.

Trends

Information that enables the analysis of the changes in the area of forest under Forest Management Plans or equivalents for the entire period since 1990 is available for 23 out of 46 countries. The observed trend is generally positive at approximately an increase of 1% increase per year. An accelerated rate of change can be observed in the Central-West region in recent years. However, stabilization (Central-East and South-West Europe) or even a negative tendency (North Europe) can also be observed in other regions. Information about changes must be treated with caution as the analysis was only carried out for an area representing around 12% of European forests.

The reported data indicate that the change rate of other wooded land under management plans or equivalents remained almost constant for the period 1990–2010.

Qualitative Indicators

Indicator B4 Production and use of wood

Interest in the production and use of wood is increasing. National instruments are mainly driven by EU regulations such as the EU FLEGT Action Plan and EU Timber Regulation

Status, trends and main changes in policy objectives since SoEF 2011

Two thirds of the reporting countries indicated that they have targets for increasing domestic wood production. This increase is linked to expected and/or desired increases in both the energy and material use of wood

60% of the reporting countries have explicit targets for increasing domestic wood production with the objectives of meeting the increasing demand in both material and energy use (i.e. Finland, Germany) and reducing the trade deficit (France). One third of these countries also report quantitative objectives for greater energy use in the range of 20% to 60%. Greater local production shall be achieved by increasing the utilisation rate to the maximum possible level. The maximum varies and is defined in relation to the total increment. The countries referred to increased mobilisation (Finland, France), increased productivity (Sweden), increased forest area (Ireland) and increasing managed area (Hungary). Around 20% of the signatories couple increased wood production with demand-side measures, particularly the promotion of wood use (Iceland, Latvia, Norway, Slovak Republic and Switzerland) and use of local wood (United Kingdom). Austria is focusing on improving wood supply chains and reducing costs while Ukraine and Romania have set specific targets for increased accessibility. 5 signatories also reported the objective of increasing the added value of forest-based products, i.e. increasing the production of high value products through a number of measures, for example discouraging the export of raw logs in the case of Montenegro.

Several countries reported that a main current objective is to increase the contribution of forests to the green economy, including that made by non-wood forest products (Spain and Bulgaria). Only Switzerland explicitly identified resource efficiency and the cascade use of forest-based products as a policy objective, and only Montenegro and Slovenia explicitly aim to achieve increased standing volume by limiting harvests to 70% and 75% of the increment respectively.

Only 8 countries reported a significant change in their main objectives since 2011. These refer to better support for small private forest owners (Belgium, Bulgaria) and the mobilisation of wood (Spain, United Kingdom), increasing the use of wood for green energy (Romania), increasing the use and sustained production of wood (Iceland) and updating previous national wood production targets (Ireland). Finally, Switzerland reported work in progress on the updating of policy objectives. Despite the fact that increased energy use is a common target, no signatory mentioned the National Renewable Energy Action Plans (NREAPs) as a driver of changes in policy targets. Similarly, no country reported the EU Rural Development Regulation as a target-setting instrument although it is frequently mention as an implementation tool. The integration of the forest into the green economy or bioeconomy are not explicitly mentioned as a drivers for the setting of policy objectives.

Changes in policy targets were mainly implemented through the adoption/revision of forest programmes or strategies, and were adopted in response to the new socio-economic context and global policy developments. New implementation measures were reported by 62% of respondents. They mainly refer to the enforcement of new legislation and forest programmes; Finland, Sweden and Romania also reported new research programmes focusing on resource modelling and markets (Finland), tree-breeding (Sweden) and increased production (Romania).

Outside the EU, Ukraine reported a new system of electronic wood accounting to prevent illegal logging. Remarkably, almost 40% of the respondents did not signal any new efforts in relation to implementation.

Institutional framework

The implementation of the EU Timber Regulation and the aim of incorporating private forest owners into active forest management appear to be the main drivers of institutional change

The institutional framework is represented for the most part by different ministries (e.g. Ministries of Agriculture and Food, Employment and Economy, Industry, Environment etc.) and state forest authorities (e.g. Forest Service, Forest Administration etc.). One third of the responding signatories reported administrative/organisational changes in the institutional frameworks.

The single major reason for institutional changes in several countries (e.g. Austria, Cyprus, Czech Republic and Italy) was the implementation of the EU Timber Regulation. In addition, a number of countries reported institutional change motivated by the need to address the challenges facing small private holdings in responding to the stated policy objectives of increased wood mobilisation and economic stimulation of forestry. This issue was addressed in Croatia with the creation of an extension service. Starting from very different circumstances and using different means, Finland, Norway, Slovenia and Montenegro increased and clarified the responsibility of private forest owners. Sweden also eased the information requirements of forest owners.

Other reported changes related to decentralisation in the United Kingdom, with the transfer of forest responsibilities from the Forestry Commission to the Welsh government. It would appear that the budgetary difficulties faced by most countries in the period 2011-2015 have not been translated into institutional reforms.

Legal/regulatory framework and international commitments

The implementation of the EU FLEGT Action Plan and EU Timber Regulation is the main driver of legal and regulatory frameworks regarding the production and use of wood

In almost all countries, the forest law is the main legal and operational basis for policies governing the production and use of wood. However, specific forest sector plans and other regulations, such as rural development plans, are also considered relevant.

Since 2011, 15 of 34 signatories reported changes, particularly in relation to the adoption of new laws/provisions for implementing the EU FLEGT Action Plan and the EU Timber Regulation (Austria, Croatia, Cyprus, France, Luxembourg, Slovenia, Ireland).

Financial instruments and economic policy

There is little change in relation to the financial instruments used by governments in the area of wood production and use

Most signatories have financial instruments for supporting forestry in place. Most of these instruments are aimed at improving forest conditions and the ability to provide multiple goods and services in a way that is sustainable and economically viable. Supporting a profitable wood supply in a context of multipurpose forestry is the approach adopted by most respondents (Hungary, Norway, Spain, Sweden, Turkey, Finland, Slovak Republic, Slovenia, Latvia, Italy, Poland). Only 8 signatories reported changes in their financial instruments. The new EU EAFRD regulation places greater emphasis on supporting innovation and horizontal and vertical cooperation along rural value chains, including forestry. The EU Member State signatory countries are in the process of adapting the new regulation in their National Rural Development Plans. Further change reported by the EU with extensive impacts in the FOREST EUROPE region are the Framework Programme for Research and Innovation Horizon 2020 which is open to broad participation and places significant emphasis on innovation and marketable solutions.

Other changes related to tax measures, for example a reduced Fee for Forest Ecosystem Services (FES) in Croatia, and an improved tax regime for private forest owners (France, Denmark).

Informational means

Around 30% of the responding signatories reported new developments regarding informational means associated with the production and use of wood

Almost one third of the responding signatories (10 out of 34) reported changes in informational means in connection with the production and use of wood, for example the establishment of informational means relating to the implementation of the EUTR at national level: e.g. a central register of due diligence systems (Czech Republic), greater information in the media about sustainable forest management and the advantages of wood products (Hungary), the establishment of registry of forest managers (Slovak Republic), an information campaign on the use of wood (Switzerland), and a production forecast for conifers based on mensuration data arising from the forest inventory (United Kingdom).

Indicator B5 Production and use of non-wood goods and services, particularly recreation

A certain trend for the inclusion of Non-wood forest products (NWFPs) in policy objectives can be observed but institutional frameworks and measures remain largely unchanged

Status, trends and main changes in policy objectives since SoEF 2011

Around 25% of the responding signatories reported changes regarding the promotion of the production and use of NWFPs

Almost one quarter of the reporting signatories (7 of 34) describe changes in main policy objectives for the production and use of non-wood goods and services. One country created its first regulation in this policy area (Iceland). Most changes related to the regulation and promotion of the recreational use of forests and the use and commercialisation of NWFPs and ecosystem services

More innovations were reported in relation to the adoption of key measures in this policy area as new initiatives were reported by 13 signatories (out of 34). These are summarised in table 41.

Table 40. Stated objectives on use of non-wood goods and services

Quantification of the protective functions and value of ecosystem services	Finland, Romania, United Kingdom
Creation of payments for environmental services	Czech Republic
Promotion of recreational services in forests	Bulgaria, Romania, Slovenia, Ukraine, United Kingdom
Ensuring easy access to forests, regardless of ownership type, with the exception of forests subject to legally defined restrictions	Latvia, Switzerland
Establishment of conditions for the improved commercial utilisationof ecosystems services and non-wood forest products	Bulgaria, Croatia, Montenegro, United Kingdom, Austria
Promotion ofentrepreneurship based on ecotourism and business based on the processing of non-wood goods	Finland, Iceland, Ukraine
Increasing the use of non-timber goods and services	Spain. Hungary, Ukraine
Securing the sustainable use of NWFP and provision of ecosystem services, including the regulation of access rights and intensity of use in some cases	Croatia, Italy, Poland Turkey
Integration of sustainable game management into sustainable forest management and forest-based tourism development	Hungary, Germany, Croatia

Table 41. Key implementation measures in relation to the use of non-wood goods and services

Development of national/ regional programmes and/or action plans	Austria: A work programme for the Austrian Forest Programme linked to the Forest Dialogue Finland: National Forest Programme 2015, the Forest Biodiversity Programme for Southern Finland METSO, the Strategic Programme for the Forest Sector and Finland's Bioeconomy Strategy Spain: Forest Action Plan (PASSFOR)
New legislation or regulations	Cyprus: legal regulation of mushroom collection in order to minimise the disturbances to forest ecosystems Latvia: new hunting legislation Ukraine: new approved rules for the use of ecosystem services
New research programmes and projects	Romania: new research projects on the environmental impacts of the extraction of several NWFPs (berries, medicinal plants, edible mushrooms)
Increased focus on urban forests	Turkey: Establishment of a nationwide network of urban forests
New grants and subsidies	Czech Republic: support for investments in forest hydrology and recreation infrastructure Hungary: support for investments in social welfare in forest, including infrastructure for social use of forests Ireland: incentives for increasing the public use of forests for recreation Sweden: support of forest-based tourism activities through a grant called "Grow with the Forest" targeted at SMEs

Institutional framework

Continuity in relation to the last reporting period the main trend

In general, changes in institutional frameworks relate to overall institutional reforms in environmental and or forest policies. No changes were reported that related specifically to the provision and use of NWPF and ecosystem services. Most changes related to the implementation of the EU Timber Regulation and the new EU Rural Development Regulation. Turkey was the only country to report the establishment of a new department within the forest administration to specifically deal with non-wood forest products and ecosystem services. Ministries of agriculture and the environment remain the main regulatory and implementation bodies. However, the role of other actors and organisations is also acknowledged. Spain, for example, reported on the creation of new professional organisations aimed improving resin markets.

Legal/regulatory framework and international commitments

Forest law is the main legal instrument and most countries reported no developments since 2011

The production and use of non-wood goods and services in a large number of countries is mainly regulated through the forest legislation. Since 2011, 5 countries have amended their forest law or included new provisions regulating the collection and use of non-wood goods and services. Bulgaria created new mechanisms for the utilization of NWFG by enhancing harvesting and commercialisation and regulating the leasing of certain forest territories; Hungary adopted a new regulation on the collection of truffles; Montenegro improved the system for granting rights for the collection and use of NWFG in state forests; and Ukraine established standardised limits and fees for the collection of NWFGs. However, the majority of countries (23 out of 34) reported "no changes" in this area.

Financial instruments and economic policy

Just a few changes in financial instruments, mostly linked to the new EU Rural Development Regulation

The majority of responding signatories (27 out of 34) reported "no changes" in overall financial instruments and economic policy. In most cases, the changes affected all indicators (B1- B12), as is the case with the new EU Rural Development regulation. Only Turkey stated some changes in financial instruments specifically relating to indicator B5 as it allocated a specific budget to the newly created department of non-wood forest products and services (see institutional frameworks), which is mainly dedicated to the compilation of an inventory.

Informational means

Few countries reported developments in informational means during the current reporting period

The majority of responding signatories (26 out of 34) reported no changes. The reported changes referred to new developments in the areas of national forest communication strategy and the use of new informational means. The most relevant initiatives undertaken in relation to communication and informational means are contained in table 42.

Table 42. New informational means on NWFP

Increased use of social media in communication	Austria
Improved statistics and reporting	Bulgaria
Observatory of forest prices including NWFPs	Spain
New database service on biodiversity and NWFPs	Turkey

Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems

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Data resources: Quantitative Indicators: Indicator 4.6: Information delivered by Bioversity International Indicator 4.7: Information delivered by EC-JRC Indicators 4.1, 4.2, 4.3, 4.4, 4.5, 4.8, 4.9: National reports on Joint FOREST EUROPE/UNECE/FAO Questionnaire on Pan-European Indicators for Sustainable Forest Management - Quantitative Indicators

Qualitative Indicators: Indicator B6: National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator 4.1 Tree species composition

Around 70% of the forests in Europe are dominated by 2 or more tree species. The remaining 30% are dominated by 1 tree species alone, mainly conifers. The area of forest covered by a single tree species decreased over the last 15 years at a rate of around 0.6% annually. This may be related to changes in forest management practices or non-management aimed at the establishment of more mixed forest stands.

Indicator 4.2 Regeneration

Annual natural expansion and regeneration is increasing slightly in the Central-West, South-East and South-West European regions, while in other European regions planting and afforestation are the most widely used annual regeneration types. Nearly 68% of the total forest area in Europe is regenerated naturally or through natural expansion. In some European countries coppicing with rotation poplar and willow coppices is becoming more common as a renewable energy source.

Indicator 4.3 Naturalness

The area of semi-natural forest and plantations increased in Europe over the 20-year period 1995-2015. Around 87% of European forests are classified as semi-natural. Undisturbed forests cover 4% and plantations 9% of forest area in Europe. The highest share of undisturbed forests within the forest area can be found in countries of Central-East and South-East Europe, while the share of plantations is the highest in the Central-West, South-West and South-East European regions.

Indicator 4.4 Introduced tree species

Introduced tree species currently dominate 4.4% of the European forest area, which is roughly equivalent to the land surface of the Republic of Ireland. Tree species that are considered to be invasive currently occupy 0.5% of Europe's forests. Although Central-West Europe presented the highest share of introduced tree species, this area declined over the last decade and no substantial changes were noted for the remainder of Europe. Importantly, concerns have been raised regarding inconsistencies in the reporting of data on introduced (and invasive) tree species in individual countries.

Indicator 4.5 Deadwood

The average volume of deadwood, both standing and lying, ranges between 8 m3/ha in North Europe and 20m3/ha in Central-West Europe. The amount of deadwood, particularly standing deadwood, increased slightly in most of Europe's regions over the last 20 years. The amount of deadwood varies considerably depending on forest types, the standing volume of the stands, the rate of decay and vegetation zones, and is influenced by forest management regimes.

Indicator 4.6 Genetic resources

The areas managed for *in situ* and *ex situ* conservation and for seed production increased during the 1990-2015 period. In 2015, around 500,000 ha and slightly more than 10,000 ha were managed for *in situ* and *ex situ* genetic conservation respectively, and 1,000,000 ha were managed for seed production. Overall, the areas were managed for a total of 145 tree species, including subspecies and hybrids. There are significant gaps in the geographical representativeness of the areas managed for *in situ* genetic conservation within the distribution range of European tree species.

Indicator 4.7 Forest landscape pattern

Two thirds of European forests are in a core natural landscape pattern. Over the 2000-2012 period, forests in this pattern tended to increase due to natural expansion of forests and newly planted forests. The remaining one third of European forests are in a mixed pattern of natural, agricultural and artificial lands and more than half of them appear as 'only some forest' embedded in predominantly agricultural and artificial landscape. For what concerns the connectivity of forest areas, the number of landscapes with highly connected forests was either stable or decreased in most countries over the 2000-2012 period. This would suggest that the distance and landscape permeability between forest areas were not sufficiently accounted for in management and planning. Landscapes with poorly connected woodlands represent over 60% of the EU territory.

Indicator 4.8 Threatened forest species

The availability of information on threatened forest species continues to develop positively in Europe. This relates to forest tree species that are reported under the IUCN Red List categories in particular. 79% of threatened forest-occurring tree species were classified as vulnerable and endangered by reporting countries, and 18% were seen as critically endangered. This includes trees growing at the limits of their potential range. The information available on other threatened species groups remains more heterogeneous and sometimes fragmentary. Thus any changes should be interpreted with care as the number of threatened species may be related to an improvement in the knowledge about species and monitoring surveys.

Indicator 4.9 Protected forests

Over the last 15 years, the area of forest in Europe designated for biodiversity and landscape protection increased by half a million hectares annually. Around 12.2% (or 29.9 million ha) of European forests are protected with the main objective of conserving biodiversity. Around 7% have the protection of landscapes representing an area of 19 million ha as a main objective. The strictness of protection for biodiversity varies considerably within Europe: while restrictive protection with minimal or no intervention dominates in North Europe and some East European countries, active management in protected areas is more common in Central and South European countries.

Qualitative Indicator

Indicator B6 Biodiversity

Biodiversity remains an important topic for forest policy and management in Europe. Biodiversity-related forest policy objectives have been maintained since the previous reporting period. Regulatory instruments continue to play an essential role in conserving biodiversity in forests and have been fostered using new financial, informational measures. The EU's biodiversity policy is a major trigger for changes related to informational, financial and legislative instruments at national level.

Indicator 4.1 Tree species composition

Area of forest and other wooded land, classified by number of tree species occurring and by forest type

Introduction

Area of forest, classified by number of tree species occurring

Species diversity and the dynamics of forest ecosystems differ considerably throughout Europe. This is reflected by the broad range of forest types found there, from boreal forest in North Europe to broadleaved evergreen forests in the Mediterranean region. These forest types are differentiated by unique key factors related to structural, compositional (including tree species composition) and functional forest ecosystem components, such as biotic and abiotic disturbance factors and forest management. Mixed forests and other wooded land, composed of several tree species, are often richer in biodiversity than those comprising 1 tree species. However, some natural forest ecosystems are dominated by only 1 or 2 species, e.g. natural boreal pine forests on dry sites, natural sub-alpine spruce stands and beech forests growing in favourable conditions on lowlands.

The countries were requested to provide updates for the tree species occurrence data for 2010 and additional trend information for the years 1990, 2000, 2005 and 2010.

Status

33 countries reported data for the year 2010. These countries account for 89% of the total forest area in Europe. The data show that around one third of European forests are dominated by a single tree species (Figure 56). Around half of the forests contain 2 to 3 tree species. 14% of the forest have 4 to 5 tree species and only 4% of the forest is composed of 6 or more tree species.

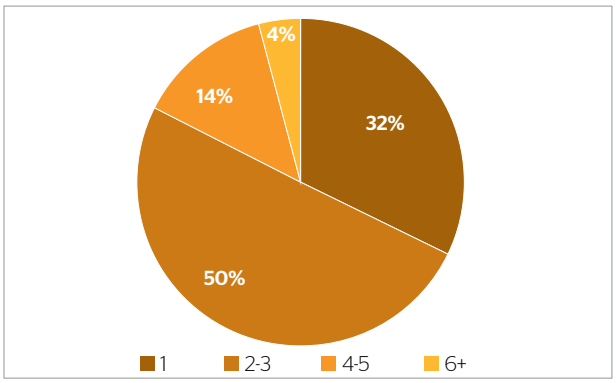


Figure 56. Forest area by species abundance category in Europe for the year 2010

Single tree species forests accounting for an over 40% share of the national forest area are found in Turkey, Cyprus, Portugal, Albania, Iceland, United Kingdom, Norway, Bulgaria, Montenegro, Poland and Austria (in order of decreasing relative importance; Figure 57).

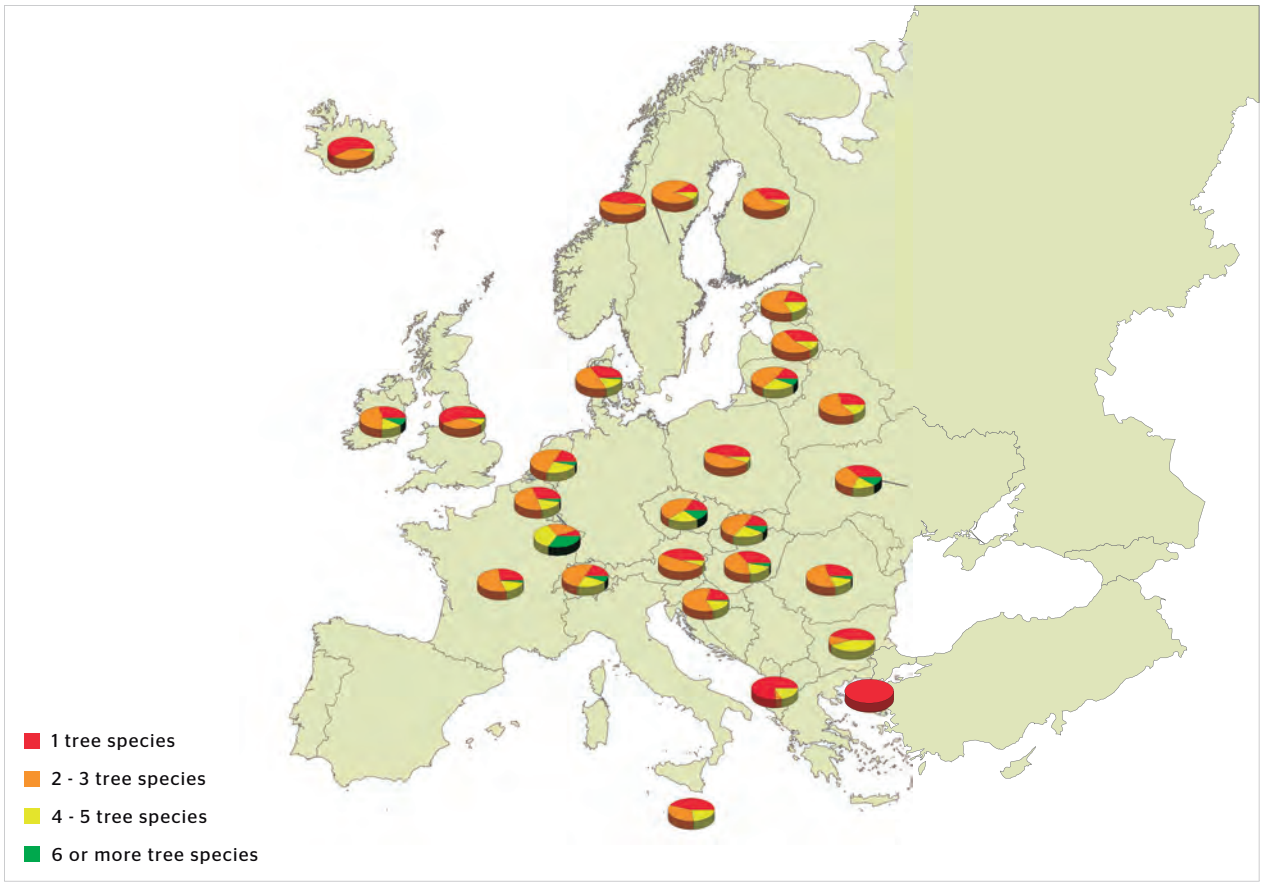


Figure 57. Forest area by species abundance category for 2010

These forests are typically homogenous single-age coniferous forests. Broadleaved forests are more likely to present a greater mixture of tree species.

Trends

Regional trend data (Figure 58) suggests a steady decrease in forests dominated by a single tree species. Between 1990 and 2010, North Europe's forests, in particular, gained a more diverse tree species composition. In general, quite a steady evolution towards mixed forest composition could be observed in all regions between 1990 and 2010.

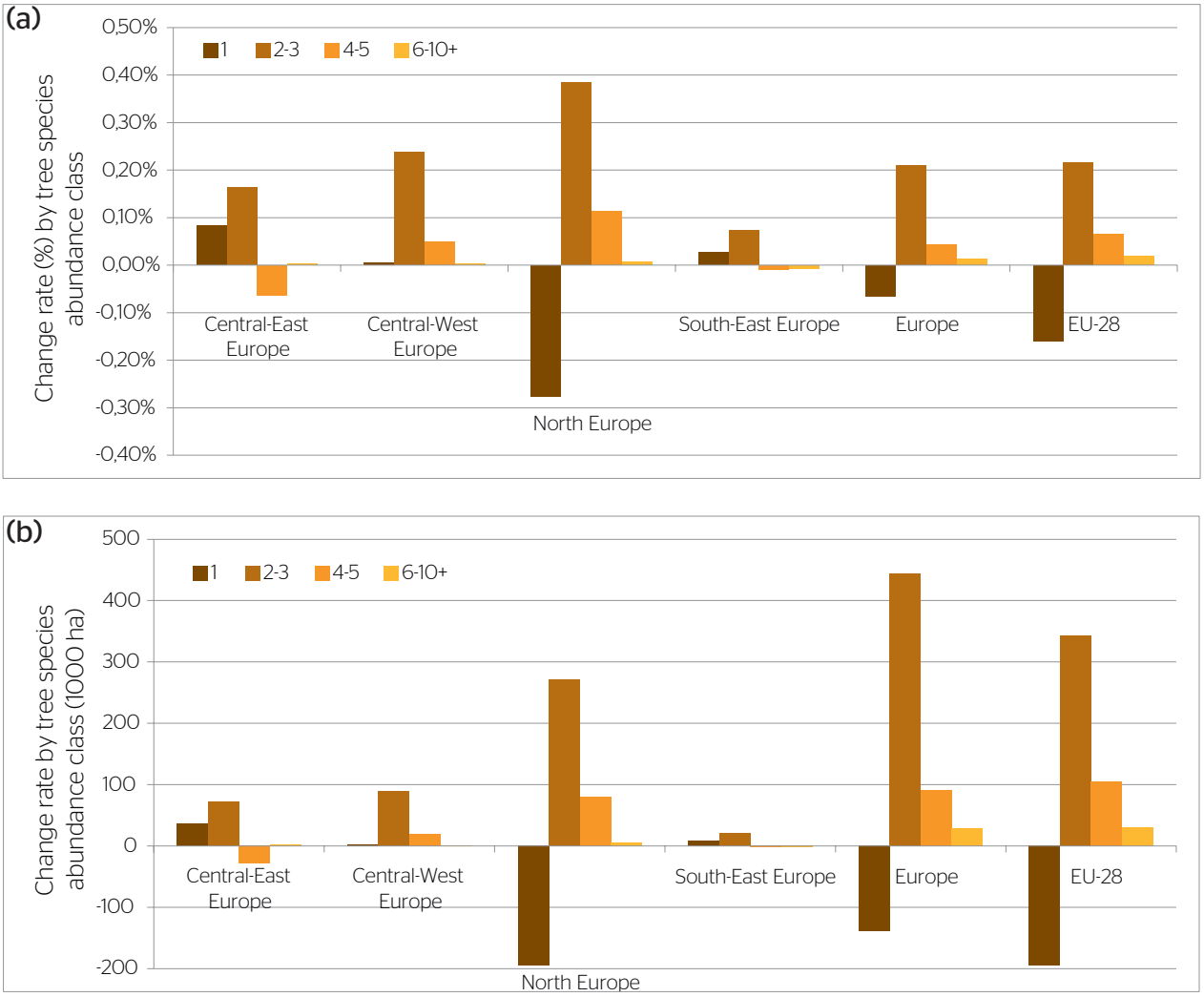


Figure 58. Trend analysis 1990-2010: Average annual rate of change by tree species abundance class: (a) change relative to 2010 (percentage) and (b) absolute change (1,000 ha)

Indicator 4.2 Regeneration

Regeneration: Area of regeneration within even-aged stands and uneven-aged stands, classified by regeneration type

Introduction

Regeneration by natural seeding, vegetative regeneration, or artificial planting and seeding is the prerequisite for maintaining the forested land as forest permanently or in the long-term.

Forested area can also be increased through afforestation or natural expansion on land that was previously subject to other uses, e.g. agriculture.

Natural regeneration contributes to conserving the diversity of the genotypes and to maintaining the natural tree species composition, structure and ecological dynamics. However, natural regeneration may not always be suitable for achieving biodiversity conservation goals. For example, to convert forests from introduced tree species to native tree species, planting is necessary in most cases, and restoration activities may require the elimination of naturally regenerating trees growing outside their natural range. Furthermore, the occasional replanting programmes made necessary by heavy storms or insect calamities may influence the proportion of regeneration methods used, and, consequently, the statistics.

Status

Nearly 40 European countries reported on the share of forest area expressed by regeneration types for 2010. The values reported here concern regeneration in forests. Regeneration in other wooded land is not discussed as the data did not allow for a comprehensive assessment. Few of data differentiate between regeneration methods in even-aged and uneven-aged forests, thus combined results are presented for these two forest structures. Forests regenerated naturally and through natural expansion clearly dominate throughout Europe. Based on the available data from the countries in 2010 (see Table 43), 133 million ha, or around 68% of even-aged and uneven-aged forests in Europe, were regenerated through natural regeneration and natural expansion. The forests regenerated by afforestation and planting and seeding represent around one quarter of the total forest area in Europe. Coppicing is only common in a few South European countries.

The type of regeneration used varies considerably between the individual countries and regions. In Central-East Europe natural regeneration and natural expansion as well as afforestation and regeneration by planting and seeding were practised to an almost similar extent. Natural regeneration and natural expansion are dominant in North, Central-West, South-East and South-West Europe.

Table 43. Share (percentage and million ha) of forest area (uneven-aged and even-aged) by regeneration types in the European regions, 2010 (based on the available data)

SOEF Region	Natural regeneration and natural expansion		Afforestation and regeneration by planting and seeding		Coppicing	
	million ha	% of forest area	million ha	% of forest area	1000 ha	% of forest area
North Europe	48.4	68	22.4	32	n.s.	0
Central-West Europe	22.3	64	10.6	30	2.0	6
Central-East Europe	16.1	52	13.0	42	2.1	7
South-West Europe	26.1	86	3.3	11	1.1	4
South-East Europe	19.9	72	4.0	14	3.6	13
Europe	132.8	68	53.2	27	8.8	5
EU 28	98.5	68	38.8	27	5.4	5

In 2010, over half of the forests were regenerated by planting and seeding, i.e. forests in Ukraine, Belgium, Hungary, Iceland, Denmark, Netherlands, Ireland and Czech Republic (Figure 59). In Latvia, Switzerland, Cyprus, Spain, Norway, Albania, Estonia, Italy, Liechtenstein, Croatia and Greece over 80% of the forests were regenerated by natural means.

In some European countries, specifically Montenegro, Hungary, Portugal, Turkey, Ukraine, France and Bulgaria, the forest area regenerated through coppicing represented around 10% of the forest area and accounted for 8.2 million ha in 2010. Short rotation poplar and willow coppices are becoming more common in Europe as a renewable energy source.

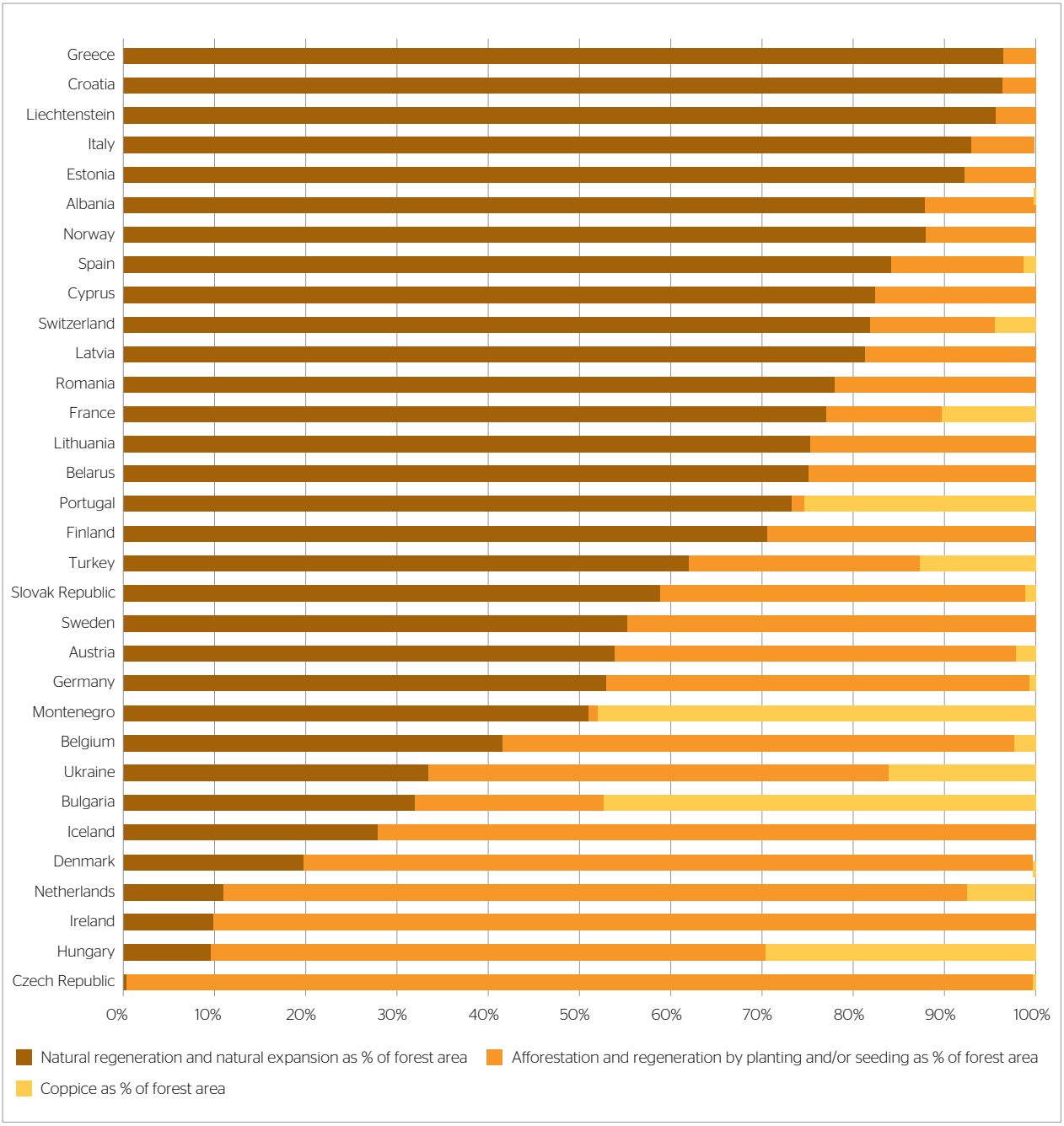


Figure 59. Share (percentage) of forest area (even-aged and uneven-aged) by regeneration types for selected countries in Europe, 2010 (based on the available data)

Almost 30 countries provided data on the annual regeneration types for 2010. This information did not differ considerably from the previous figures on the share of forest area divided by regeneration types. Regeneration by planting dominates in Central-East and North Europe (see Figure 60). Annual afforestation accounts for the highest share in South-East and South-West Europe. The share of annual natural expansion is also the highest in these regions. Based on these figures it may be stated that the increase in new forest area is most intensive in South-East and South-West Europe and is the result of both natural and artificial regeneration. As an annual regeneration type, natural regeneration is most common, in Central-West (Switzerland, Liechtenstein) and North Europe (Estonia, Latvia, Lithuania and Norway).

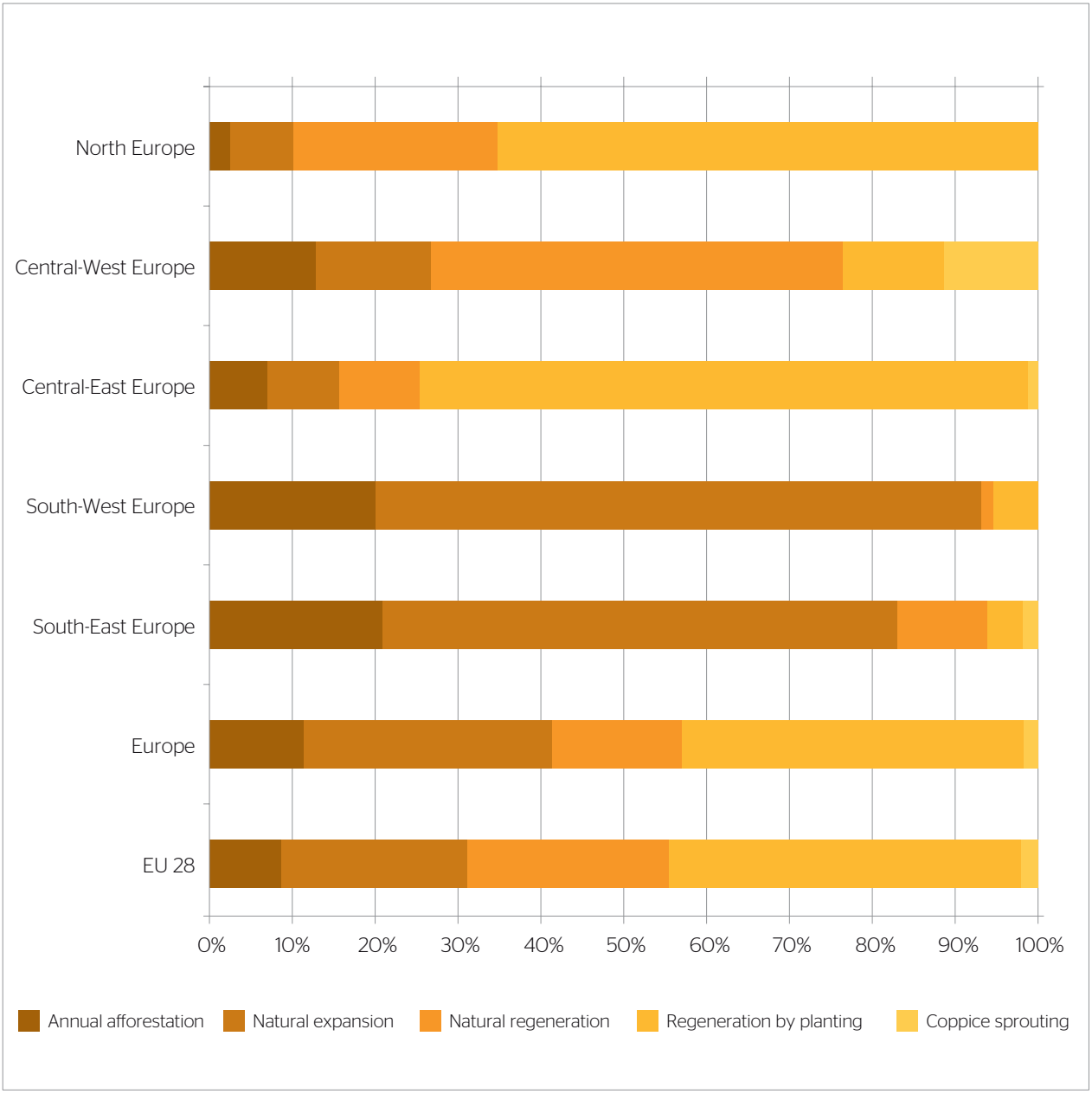


Figure 60. Share (percentage) of the total regenerated area in European regions represented by annual afforestation, natural expansion, natural regeneration, planting and coppice sprouting in 2010 (based on the available data)

Trends

Around 30 European countries submitted the complete data set on regeneration for 1990, 2000, 2005 and 2010. A comparison between 1990 and 2010 in Europe indicates that the forest area regenerated by afforestation and by planting and/or seeding increased by 10 million ha while that regenerated by coppicing rose by 2 million ha. A detailed analysis by European region and county reveals that natural regeneration and natural expansion as regeneration types increased in all regions except North Europe. In Sweden and Finland the shares accounted for by natural regeneration and planting/seeding indicate a slight increase in planting and seeding over the last 20 years. Based on the data for the annual regeneration methods, it may be assumed that natural regeneration is quite stable in Central-East and Central-West Europe, whereas in South-East and South-West Europe there was an increasing trend in natural regeneration and expansion over the last 20 years (see Figure 61).

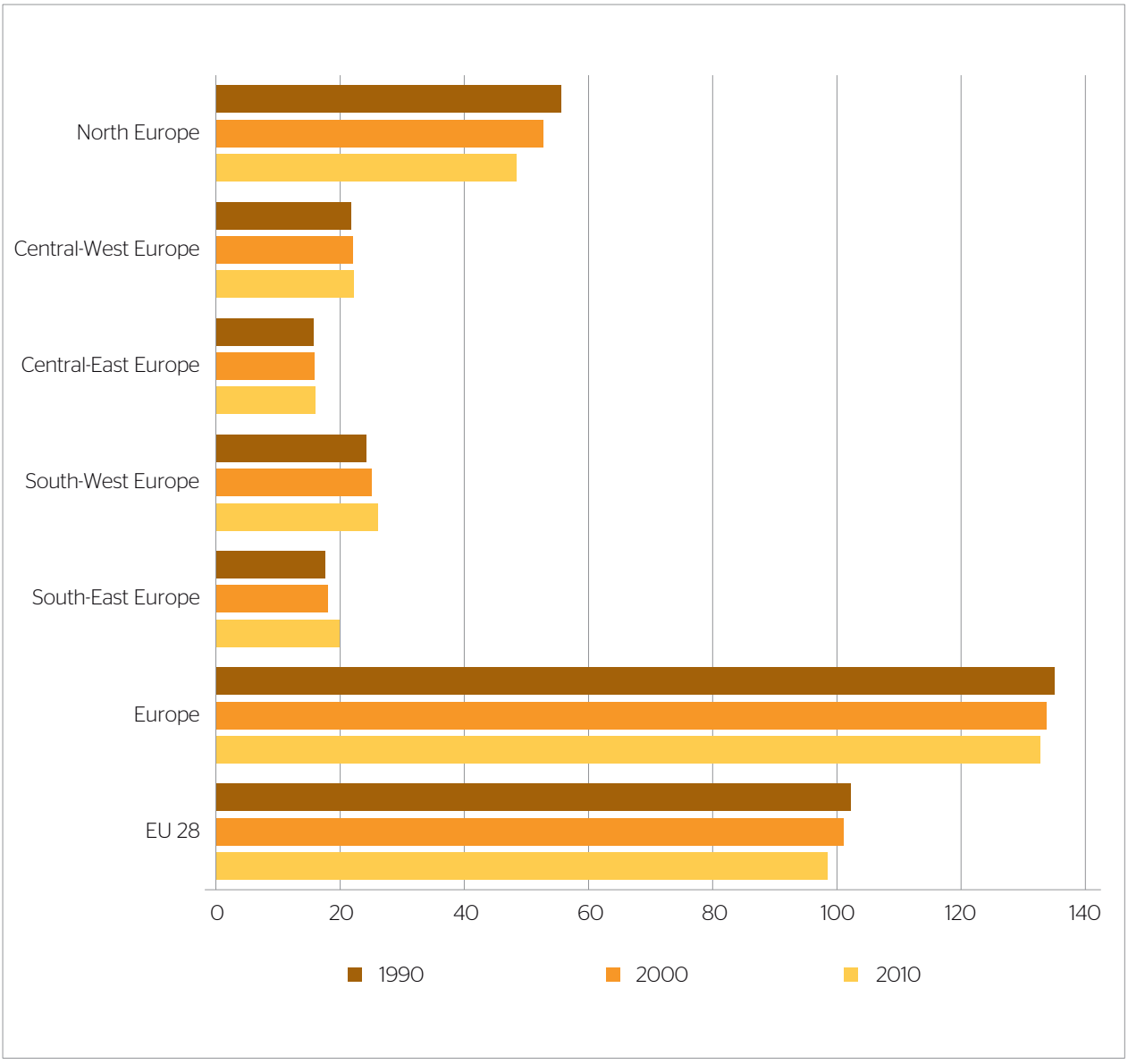


Figure 61. Natural regeneration and natural expansion of forest area (1,000 ha) in European regions for 1990, 2000 and 2010 (based on the available data)

Indicator 4.3 Naturalness

Naturalness: Area of forest and other wooded land classified as "undisturbed by man", "semi-natural" or "plantations", each by forest type

Introduction

The degree of naturalness of forests reflects the intensity and history of human intervention. Variations in utilization intensity are indicated not only by the remaining forest area in the country, but also by changing structures and the presence of different species communities within the forested areas.

Degrees of naturalness are described in this report using three categories: forest area undisturbed by man, semi-natural forests and plantations. Forests undisturbed by man are those in which the natural forest development cycle has remained or been restored, and displays the characteristics of natural tree species composition, natural age structure, deadwood components and natural regeneration, and no visible sign of human activity.

Forests undisturbed by man have a high conservation value, especially when they form large-scale continuous forest areas allowing natural disturbance processes to arise. Undisturbed forests also serve as reference areas for understanding ecological principles and contribute to the development of forest management methods.

Plantations usually represent ecosystems on their own, which are established artificially by planting or seeding, often with introduced tree species, and are intensively managed. Semi-natural forests are neither undisturbed by man nor plantations, but display some characteristics of natural ecosystems. However, stands are also considered semi-natural forests if they were established as plantations but did not undergo intensive management for a significant period of time.

Status in 2015

The analyses of classes of naturalness are based on data from nearly 40 European countries. The values reported here concern the naturalness in forests. Naturalness in other wooded land is not discussed as the data did not allow for a comprehensive assessment. Most forests in the Europe (87%, 174million ha of the forest area) were classified in 2015 as semi-natural (see Figures 62 and 63, Table 44). Due to the definition, semi-natural forests include a broad range of forests with different levels of naturalness and biodiversity.

The share of forests undisturbed by man in Europe as a whole represents around three percent (7.3 million ha) of the total forest area.

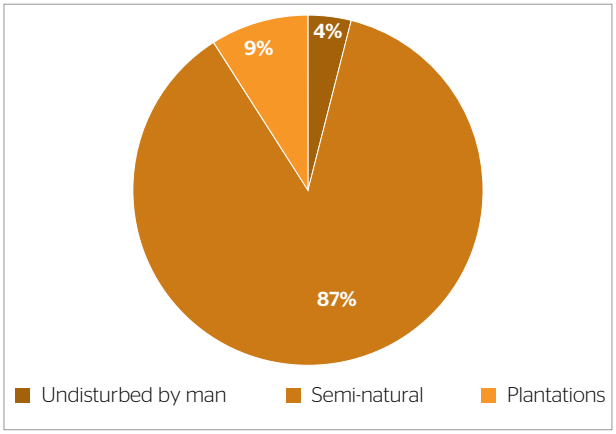


Figure 62. Distribution (percentage) of forest area in Europe by classes of naturalness, 2015 (based on the available data)

Table 44. Share (percentage and million ha) of forest area by classes of naturalness for European regions, 2015 (based on available data)

SOEF Region	Undisturbed by man		Semi-natural		Plantations	
	million ha	% of forest area	million ha	% of forest area	million ha	% of forest area
North Europe	2.9	4	66.5	94	1.3	2
Central-West Europe	0,.1	0	32.3	84	6.1	16
Central-East Europe	3.0	8	30.4	83	3.5	9
South-West Europe	0.1	0	26.3	85	4.4	14
South-East Europe	1.2	5	18.4	79	4.0	16
Europe	7.3	3	174.0	87	19.3	9
EU 28	3.1	4	134	89	12.9	9

In terms of classes of naturalness considerable differences exist between the European regions (see Table 44, Figure 63). The highest proportion of undisturbed forests within the forest area can be found in countries in Central-East and South-East Europe, while the share of plantations is the highest in Central-West, South-East and South-West Europe. Large areas of forests undisturbed by man, i.e. over 100,000 ha, can be found in Montenegro, Belarus, Norway, Finland, Romania, Bulgaria, Turkey, Sweden and Georgia (see Figure 63 and 64). In most European countries, the share of forests undisturbed by man is low, ranging from 0% to 1% of the forest area. Forests undisturbed by man are mostly located in remote or inaccessible areas where extreme climate or topographical conditions prevail.

Plantations cover around 20 million ha, or 9% of the total forest area in Europe. Plantations are important for wood production in many countries and dominate forest areas in Iceland, Ireland, United Kingdom, Denmark and Belgium (Figure 65). All forests in Malta are plantations. The definition of plantation includes the reservation that stands of native tree species that were established as plantations but have been subject to intensive management for a significant period of time could be considered semi-natural forests. This could influence the interpretation of the data, especially regarding old plantations that have been transferred in part to semi-natural forests.

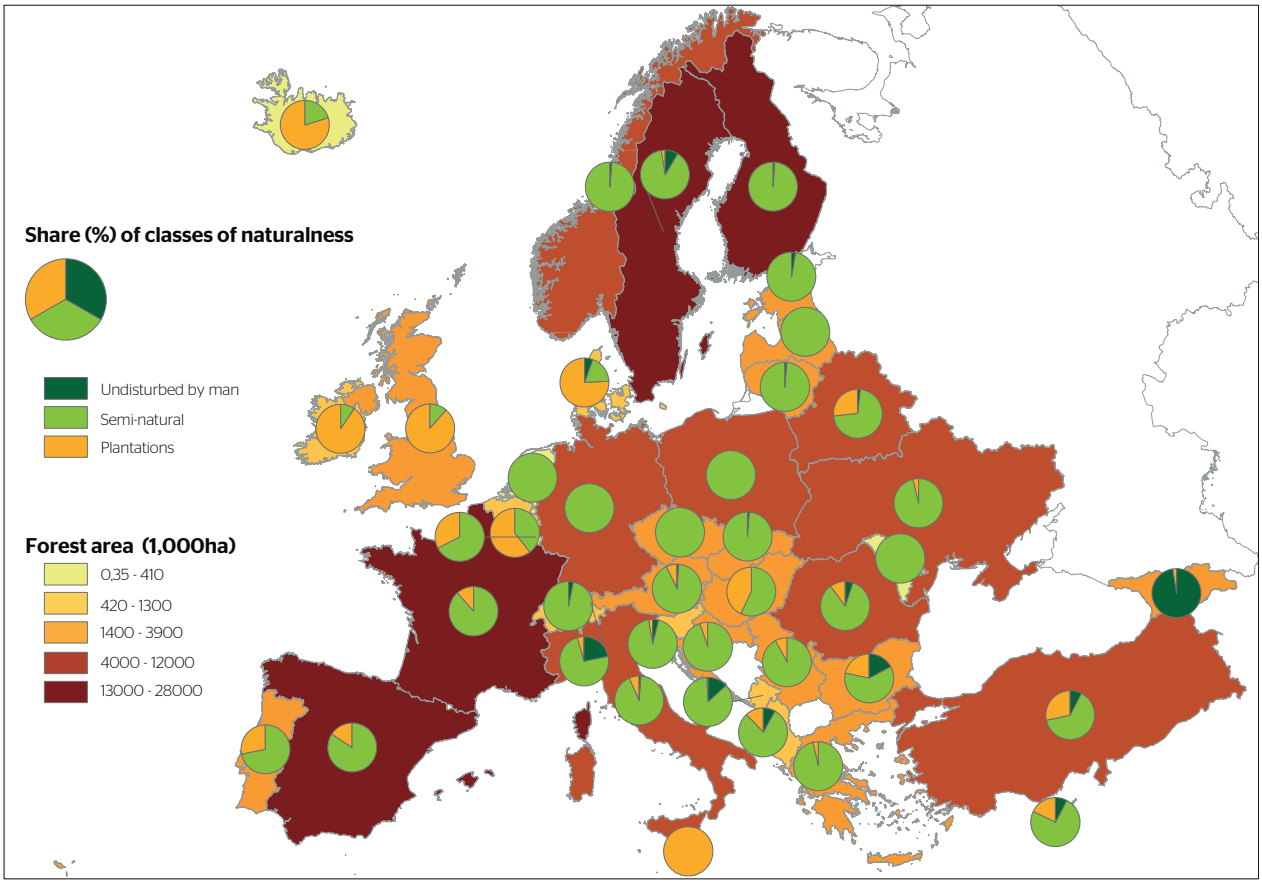


Figure 63. Share of the classes of naturalness (percent) in the forest area in Europe by country, 2015 (based on the available data)

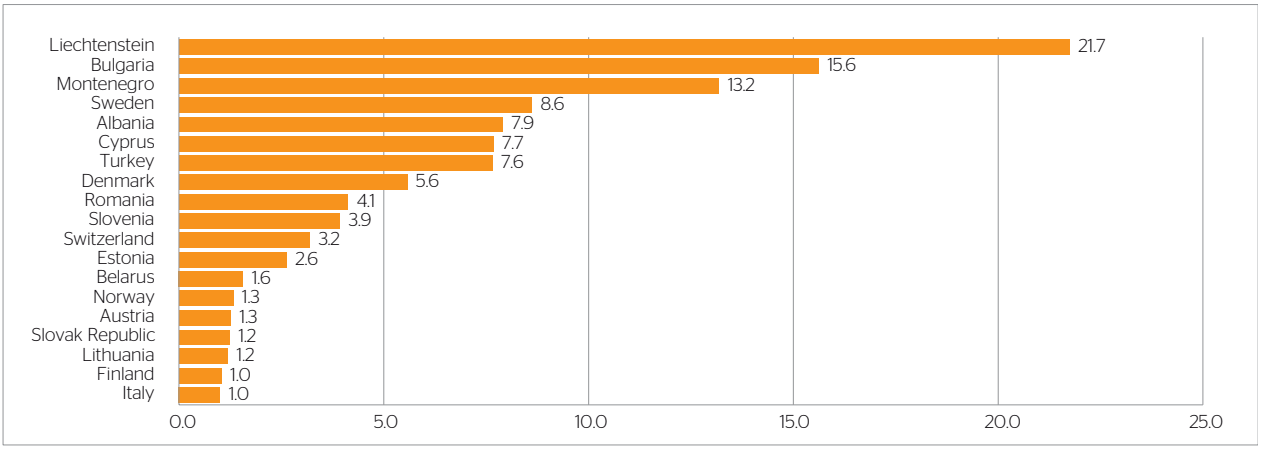


Figure 64. European countries with a share of forest undisturbed by man equal to/higher than 1% of the total forest area, 2015 (based on the available data)

Trends

The area accounted for by semi-natural forest and plantations in Europe increased over the 20-year period under consideration (Figure 66). The area of semi-natural forests expanded considerably by 11.8 million ha while the area of plantations increased by 3.8 million ha. These changes can be partly explained by the increase in the total forest area, afforestation and different interpretations of the definitions. The small increase of the area of undisturbed forests may reflect forest protection measures. However, in several countries, former semi-natural forests that were initially designated as protected areas have subsequently been considered as undisturbed forests.

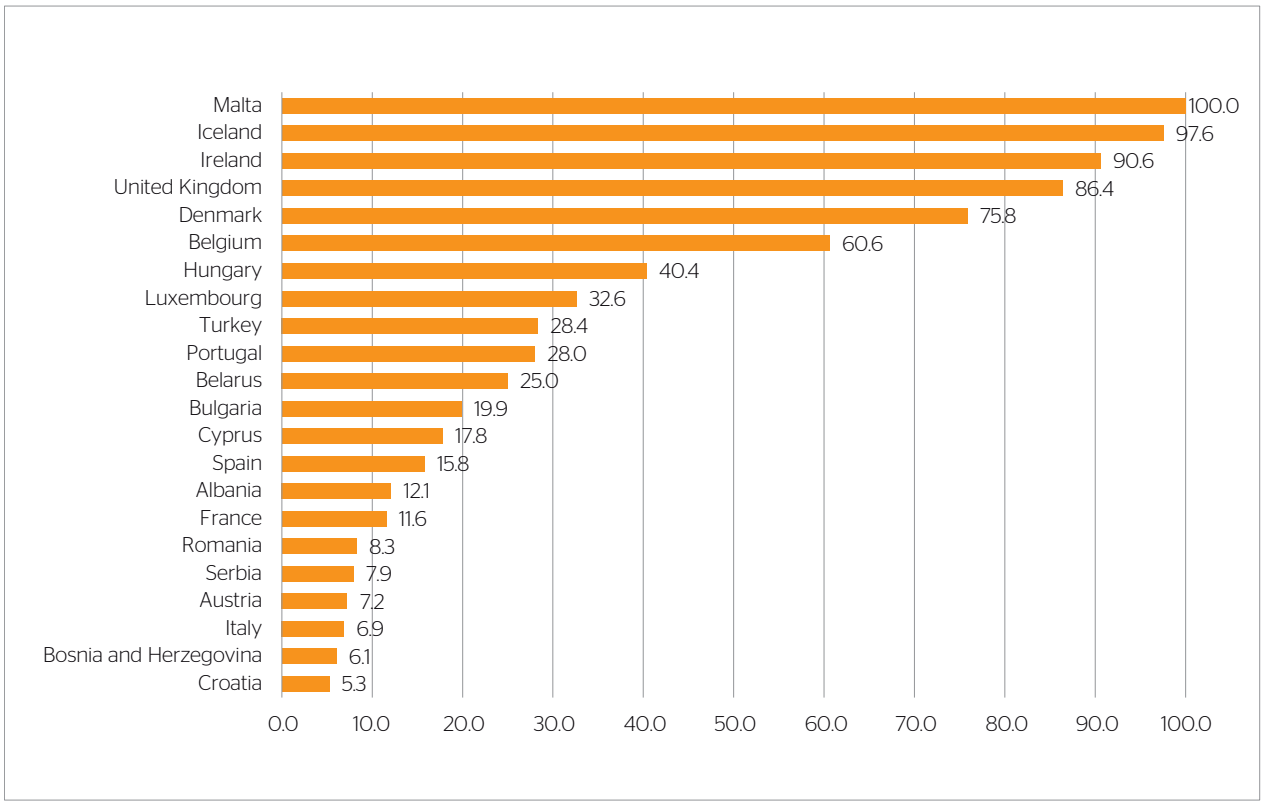


Figure 65. European countries with a share of plantations greater than 5% of the total forest area, 2015 (based on the available data)

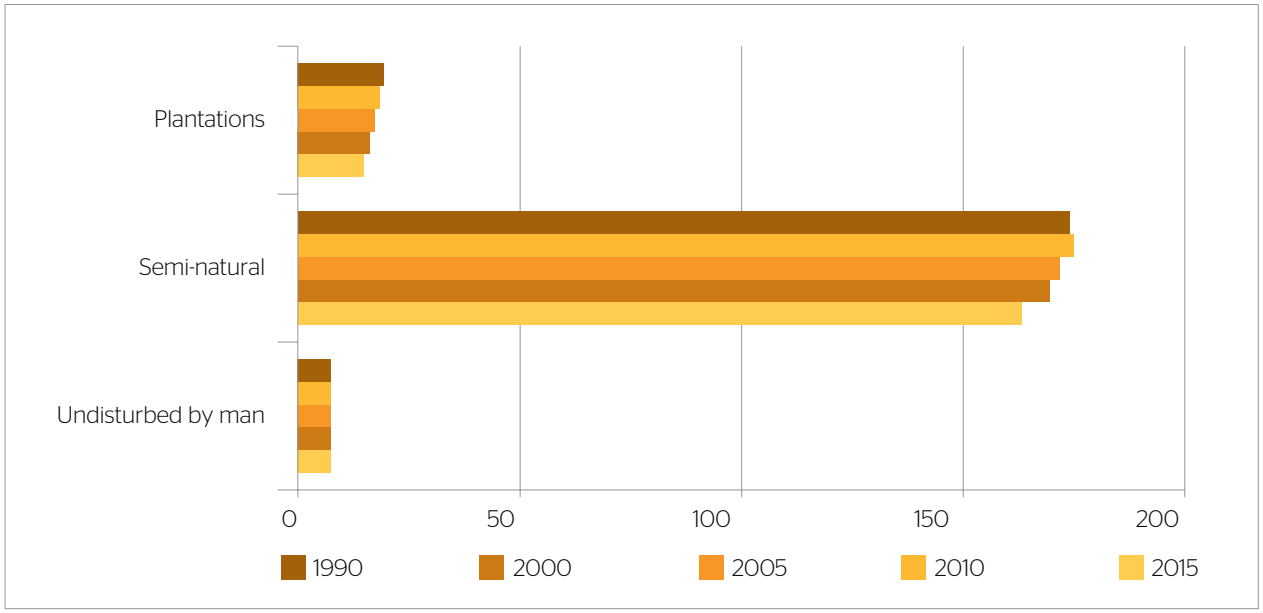


Figure 66. Forest (million ha) by classes of naturalness in Europe for 1990, 2000, 2005, 2010 and 2015 (based on the available data)

Indicator 4.4 Introduced tree species

Area of forest and other wooded land dominated by introduced tree species

Introduction

Introduced tree species may be defined as tree species occurring outside their natural vegetation range; they are sometimes also referred to as *non-indigenous, exotic or alien species*. There are various reasons for introducing tree species outside of their natural range, such as the need to satisfy the growing demand for wood, increase forest cover quickly, introduce species for horticultural purposes, restore disturbed forests or reduce erosion.

Although some introduced tree species make a significant contribution to wood production in many countries, certain species have become problematic due to their ecological characteristics, which put substantial pressure on native ecosystems. Such introduced tree species are referred to as *invasive tree species*, i.e. species whose introduction and consequent spread cause socio-cultural, economic and/or environmental harm. In particular, such species may change the function, structure and dynamics of forest ecosystems.

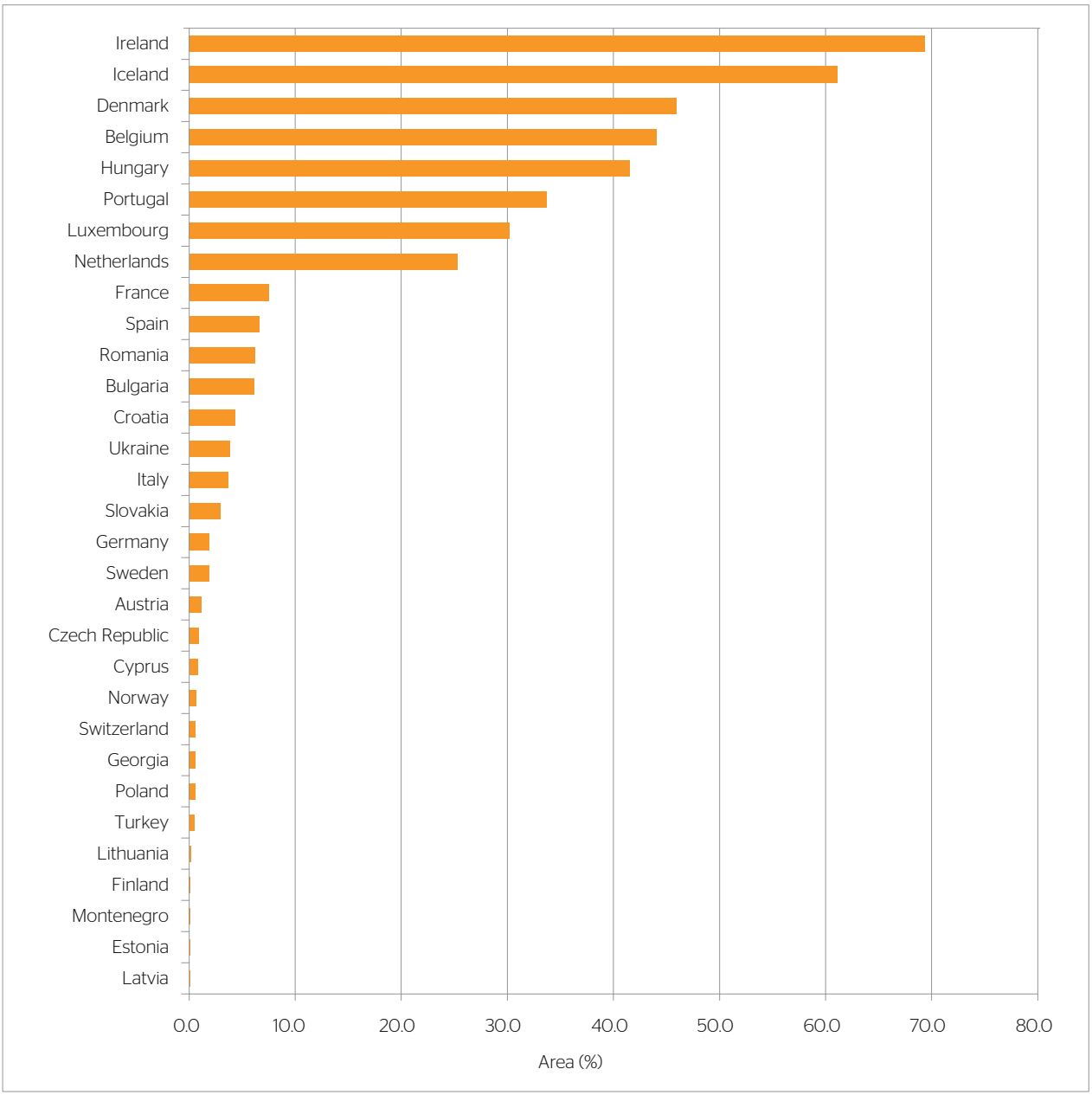


Figure 67. Share of forest area dominated by introduced tree species as of the total forest area (percentage) in 2015 (the following countries are not presented due to a lack of forest cover or available data: Liechtenstein, United Kingdom, Belarus, Moldova, Andorra, Holy See, Malta, Monaco, Albania, Bosnia and Herzegovina, Greece, Serbia, the Former Yugoslav Republic of Macedonia and Slovenia)

Status

Introduced tree species cover just over 9.5 million ha, which equates to 4.4% of the total European forest area. The largest areas dominated by introduced tree species are currently found in South-West and Central-West Europe where they occupy 8.5% (i.e. 2.6 million ha) and 6.5% (i.e. 2.5 million ha) of these regions' forests respectively. In contrast, the lowest proportion of introduced tree species was reported in North Europe, i.e. 1.4% (about 1 million ha).

The largest share of introduced tree species is found in Ireland, Iceland, Denmark, Belgium, Hungary and Portugal (Figure 67). The status clearly reflects the fact that plantation forests, where introduced species are used, are common in some of the above-mentioned countries. In Ireland, for example, introduced tree species (mainly *Picea sitchensis* and *Pinus contorta*) were used predominantly for afforestation with a view to increasing the country's forest area, which only represented 1% of the land cover at the beginning of 20th century. Today, thanks to afforestation schemes using introduced species, the forest area covers 11% of the country's land area. In the case of Iceland, which has only 1 native tree species, *Betula pubescens*, introduced tree species have also played an important role in the efforts to increase the country's forest cover.

Although 20 countries did not state the precise year in which the data were recorded, the remainder of the countries reported that the data were collected between the years 2005 and 2015. Extrapolation (of the most recent available data) was the most frequently cited method of generating values if 2015 data were not available. The data for other wooded land were not used as only 7 countries supplied data for this category.

It is important to note that many introduced tree species play a key role in timber production, in particular, various introduced *Pinus* species; i.e. *P. contorta, P. nigra, P. radiata* etc. Species from this genus cover approximately 1.7 million ha in Europe (Table 43). Commercially important introduced tree species also include *Picea* spp., *especially P. sitchensis* and *P. abies*, which account for a substantial proportion of the forestry estate in Central-West and North Europe (Table 45).

Pseudotsuga menziesii is an introduced tree species that has been widely planted in most parts of Europe due to its characteristics, i.e. high production and quality timber properties. It accounts for almost 0.8 million ha in Europe (see details in Table 43). Furthermore, in the context of climate change *P. menziesii* is considered as offering competitive advantages as it is less susceptible to heat and drought damage compared to *Picea abies*, for example.

The significance of Eucalyptus spp. is particularly pronounced in South-West Europe where it covers almost 0.8 million ha (majority of this area is reported in Spain). In addition, the presence of *Larix spp.* (e.g. *L. decidua, L. kaempferide, L. europea, L. leptolepis*) and *Populus spp.* (other species excluding *P. tremula*) have been reported in all parts of the European continent (Table 45).

With regard to introduced tree species referred to as invasive: these currently occupy just over 1 million ha (i.e. 0.5%). *Robinia pseudoacacia* and *Ailanthus altissima* were the most frequently reported invasive species and are most common in the Central-East and South-East Europe country groups. It should be noted, however, that their occurrence in other European regions may be under-reported as many countries did not supply the relevant data. The largest share of invasive tree species is found in Hungary where invasive tree species, mainly *R. pseudoacacia*, occupy 24% (approximately 0.5 million ha) of the entire country's forest area. Denmark and Italy follow with 5.5% and 2.7% respectively. *R. pseudoacacia* is widely used for various purposes, such as ornament, timber, firewood, re-vegetation of dry land and provision of nectar for honey production. *A. altissima* is mainly used for its ornamental properties; it is also used in roadside planting. *Pinus mugo, Acer negundo* and *Prunusser otina* were also reported as invasive.

Table 45. The area (1,000 ha) occupied by individual introduced tree species. The numbers in the brackets following each area value indicate the number of countries within an individual country group that provided data

Country group/total number of countries in the group	Area of introduced tree species (1,000 ha)							
	Pinus spp.	*Picea spp.*	*Pseudotsuga menziesii*	*Eucalyptus spp.*	*Populus spp.*	*Larix spp.*	*Quercus rubra*	*Abies spp.*
North Europe (n=8)	565 (6)	179 (4)	0 (0)	0 (0)	1 (3)	54 (7)	0 (0)	33 (3)
Central-West Europe (n=10)	647 (9)	1362 (8)	731 (9)	0 (0)	280 (5)	276 (7)	120 (4)	18 (2)
Central-East Europe (n=9)	96 (6)	11 (1)	15 (5)	11 (1)	172 (5)	9 (1)	92 (6)	0 (0)
South-West Europe (n=5)	312 (2)	0 (0)	40 (2)	770 (3)	97 (1)	9 (1)	0 (0)	0 (0)
South-East Europe (n=11)	71 (5)	0 (0)	8 (6)	2 (2)	59 (3)	2 (2)	0 (0)	0 (0)
Total area (n=43)	1,690 (28)	1,551 (13)	793 (22)	783 (6)	609 (17)	350 (18)	212 (11)	51 (5)

Trends

In the 38 countries that provided time series data, the total area of introduced tree species in Europe remained relatively stable over the last 25 years (Figure 68). However, a slight decrease in the area occupied by introduced tree species could be observed in Central-West Europe over the past decade. This may be attributed to the changes in forest management paradigms, the ways introduced species are perceived and the emphasis being placed on native species. In most of the countries, only marginal changes occurred in the extent of the area dominated by invasive tree species. In particular, there has been a visible decline in the area of introduced tree species in France over the last ten years. The trend for EU 28 and for all of Europe can be observed in Figure 69.

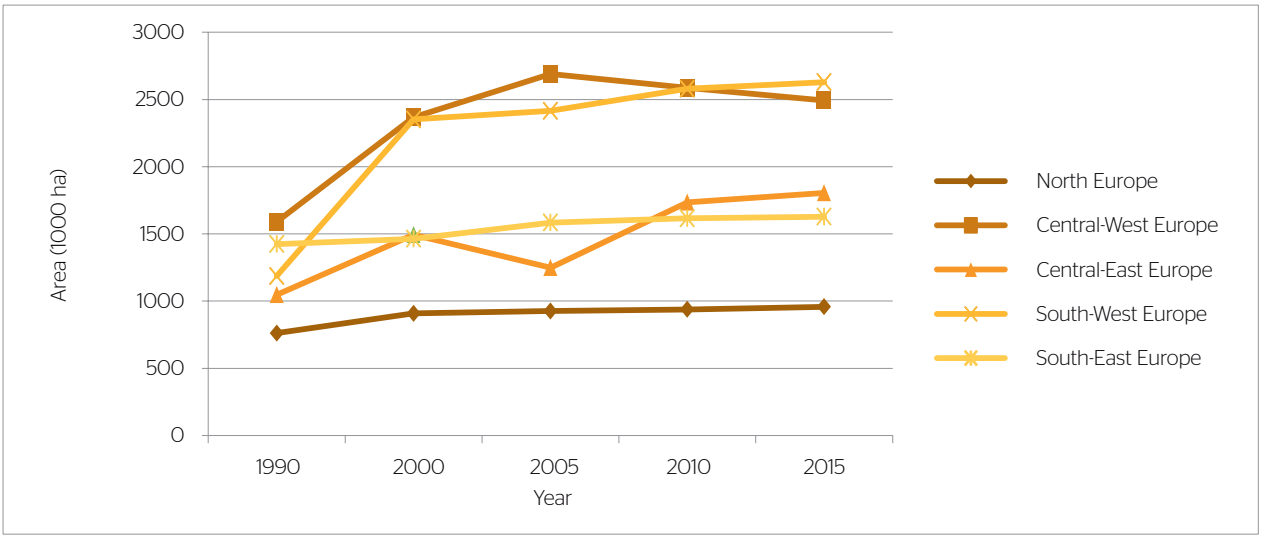


Figure 68. Area of introduced tree species in individual European regions

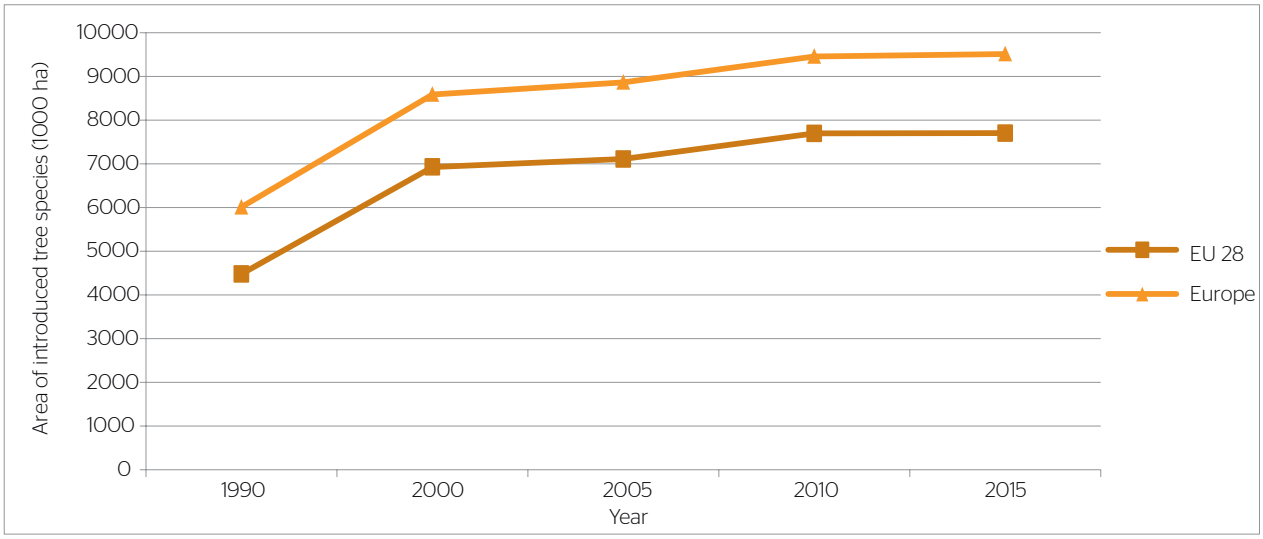


Figure 69. The sum of forest areas dominated by introduced tree species for EU 28 and all European countries

Indicator 4.5 Deadwood

Volume of standing deadwood and of lying deadwood on forest and other wooded land classified by forest type

Introduction

Deadwood is an important substrate for a large number of forest species, including vertebrates, invertebrates, algae, bryophytes, vascular plants, fungi, slime moulds and lichens. Deadwood contributes to the structural stability of soils, e.g. on slopes, and it helps in the retention of organic matter, carbon, nitrogen and water. Deadwood can be considered as an array of microhabitats that evolves continuously over time through increasing decay with each phase being distinguished on the basis of the associated species. The amount of deadwood in natural forests depends on many factors, such as tree species composition and structure, the stage of succession, the type and frequency of natural disturbance in the region, the type of management, and the soil and climate characteristics. The amount of deadwood in undisturbed and managed forests varies considerably. The late development stages of natural forests are characterized by the large volumes and diversity of deadwood.

The type of deadwood is important and is related to properties, such as whether the deadwood is standing or lying, its dimensions, and the tree species of the deadwood. In general, lying deadwood is richer in species than standing deadwood, however some species or species clusters are confined to standing or lying deadwood only, indicating that both types have their own intrinsic importance. Felling residues form yet another type of deadwood that is important for many species. The dimension (diameter) of deadwood is also an important deadwood property as different saproxylic species, for example, are limited to different sizes.

As European forests have been managed for long periods of time, the late development phases are missing or scarce. Because of the lack of deadwood in many forests, several of the deadwood-dependent species are endangered. Indeed, increasing the amount of deadwood in forests is considered one of the potential management options for enhancing biodiversity in most of Europe's forest types. On the other hand, in some circumstances, the accumulated fresh dying deadwood can create a risk of insect outbreaks.

The countries were asked to provide updates for deadwood for 2010 and additional trend information for the years 1990, 2000 and 2005.

Status

Total deadwood, standing and lying

A total of 28 countries, which account for 72% of the forest area in Europe, provided information on the status of deadwood in 2010. The values reported here concern deadwood in forests. Deadwood in other wooded land is not discussed as the data did not allow for a comprehensive assessment. The weighted average volume of total deadwood as the sum of both standing and lying deadwood is around 11.5 m^3/ha for the reporting countries. In terms of the individual regions, deadwood amounts range from between 8 m^3/ha in North Europe to 20 m^3/ha in Central-West Europe. At country level, the estimates for standing and lying deadwood range between 5 and 15 m^3/ha for most countries. The outliers are countries like Albania, Cyprus and Serbia, which reported values below 2 m^3/ha. Latvia and France report figures just under 25 m^3/ha (Figure 70) while Slovak Republic reported the very high average amount of standing and lying dead wood of 40.6 m^3/ha.

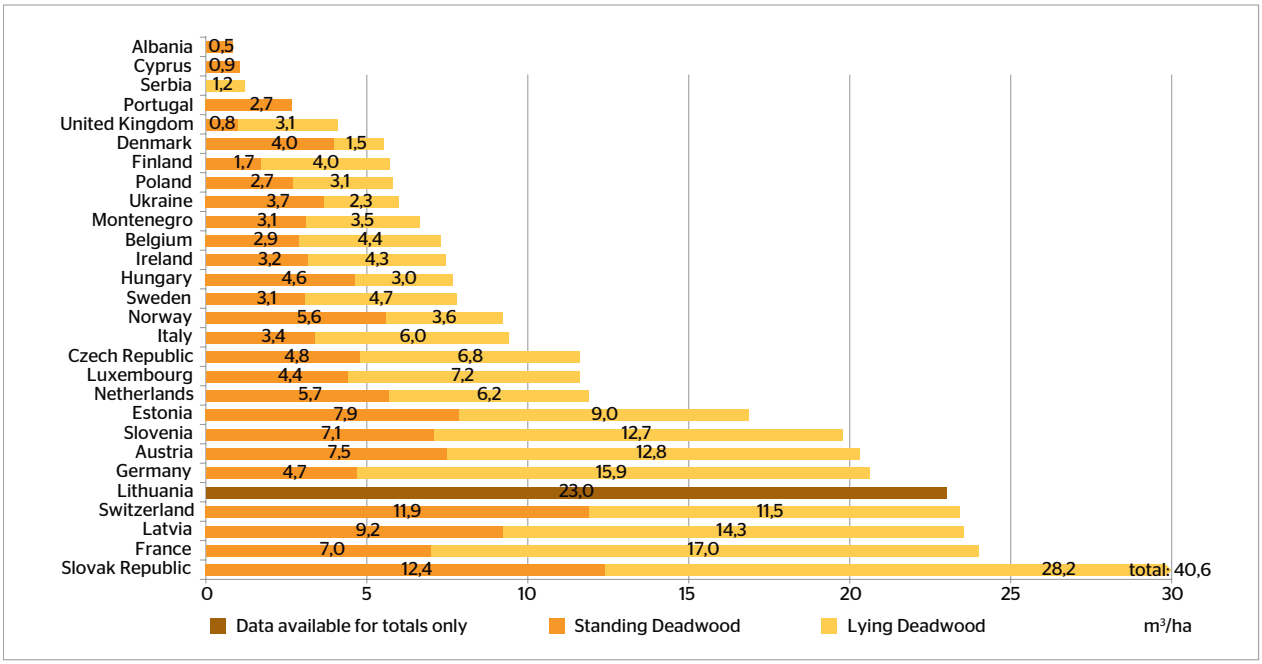


Figure 70. Average volume of standing and lying deadwood by country, reference year 2010

Trends

A sufficient amount of data allowed for the analysis of trends for the regions Central-West Europe, South-East Europe and North Europe (Figure 71). The data for these regions suggest a continuing increase in deadwood in forests. For other regions, the relative importance of the trend information that was actually available was counteracted by the missing data. Nevertheless, a similar trend can also be assumed with caution for these regions.

The increase in the amounts of deadwood can be explained through the effect of policy in favour of nature-oriented forest management, for example, or through the setting of requirements by forest certification schemes. However, major disturbances, such as storms, fires or insect outbreaks, can also result in considerable regional and even national variations.

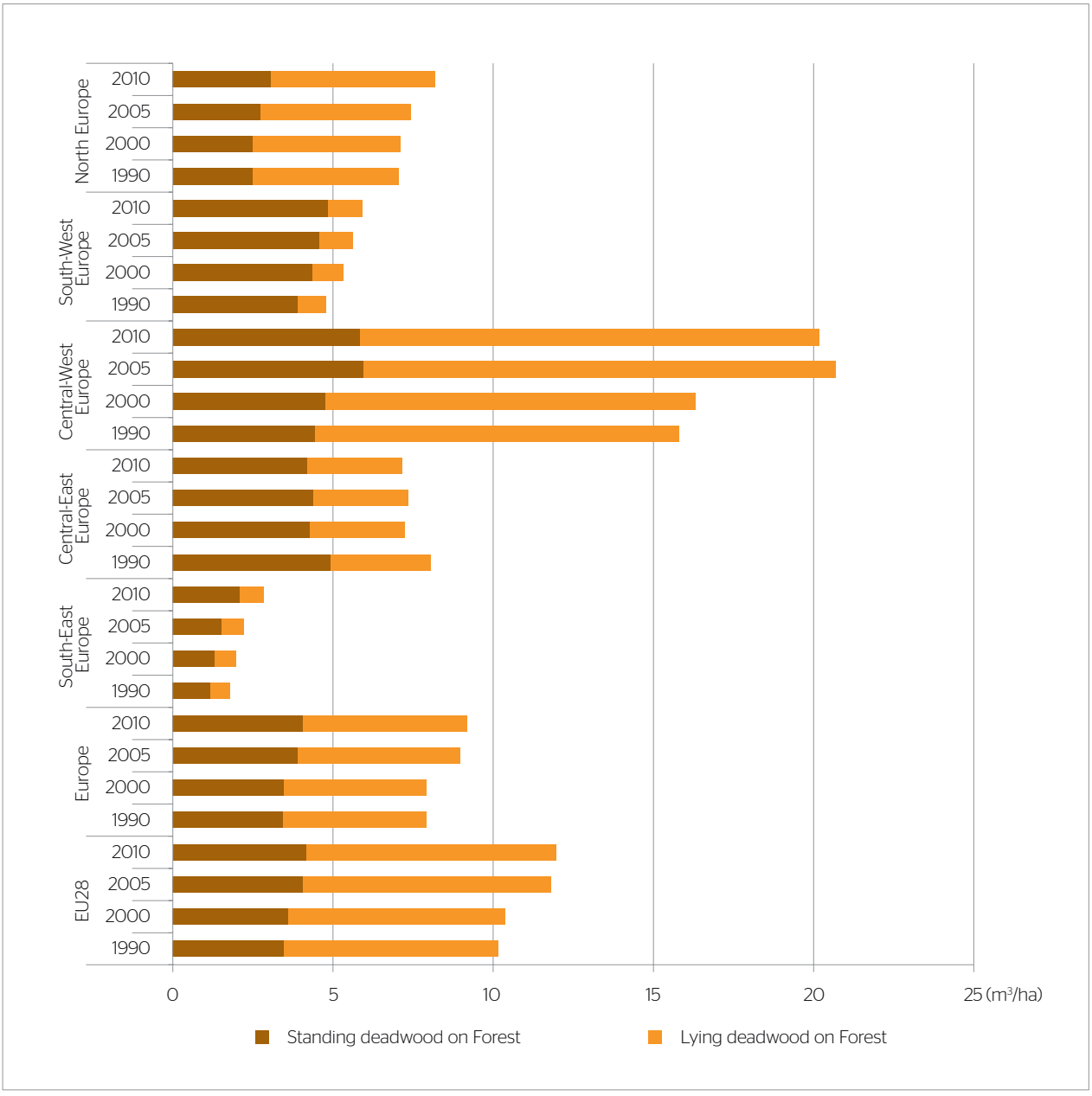


Figure 71. Weighted average volume of standing and lying deadwood by region for the years 1990, 2000, 2005, 2010. Based on data for the countries, for which data were available for at least one reference year. Missing data were replaced by duplicates from the nearest available reference year

Indicator 4.6 Genetic Resources

Area managed for the conservation and utilization of forest tree genetic resources (in situ *and* ex situ *genetic conservation) and area managed for seed production*

Introduction

The conservation and use of forest genetic resources is a vital component of sustainable forest management. Genetic diversity ensures that forest trees can survive, adapt and evolve under changing environmental conditions. Genetic diversity is also needed to maintain the vitality of forests and cope with pests and diseases. Forest management in Europe is largely based on the management of wild or semi-wild tree populations; the establishment of new forests through artificial or natural regeneration always involves the deployment of genetic material.

Following the establishment of the European Information System on Forest Genetic Resources (EUFGIS) in 2010, 34 European countries started to implement the "pan-European minimum requirements for dynamic genetic conservation units of forest trees" for the data reported as "area managed for *in situ* conservation". The minimum requirements are based on the concept of the dynamic conservation of genetic diversity, which emphasizes the maintenance of evolutionary processes within tree populations to safeguard their potential for continuous adaptation.

Ex situ genetic conservation units consist of stands and clone collections established with collected or multiplied genetic material. Seeds from forest trees are produced in specific areas established (seed orchards) or selected (seed stands) for this purpose. Data on areas managed for *ex situ* genetic conservation and seed production have been collected consistently since 1990.

Status

A total of 38 countries reported their 2015 data on this indicator (or part of it) to the EUFORGEN Secretariat at Bioversity International (see Table 32 Output Tables, data per country). Of these countries, 36 had also provided the data in 2010, while only 25 provided the data in 1990 and 2000. Most countries (34) used the EUFGIS Portal (http://portal.eufgis.org) to report areas managed for genetic conservation. The EUFGIS database is populated by national data providers and contained data on 3,213 units in January 2015. The units harbour a total of 4,057 tree populations and most of them (92%) are managed for *in situ* genetic conservation. The data reported on the area managed for *ex situ* genetic conservation include both dynamic and static *ex situ* genetic conservation units. Areas managed for seed production include seed orchards and seed stands. Seed sources identified for seed collection in the national registers of basic material are excluded as they are not actively managed for seed production.

The total areas managed for genetic conservation per country do not provide adequate information to enable the assessment of the status of the genetic conservation of various tree species at pan-European level as their distribution ranges and biological characteristics vary considerably. Hence the countries were also requested to report the areas per tree species. In Annex 8: Output Tables 32, 33, 34 and 35 show species-specific data for the trees listed under the Council Directive (1999/105/EC) on the marketing of forest reproductive material. As the EUFGIS database provides geo-referenced data on the conservation units, the geographical distribution of the units was compared with the distribution maps of selected tree species with a view to drawing some conclusions on the geographical representativeness of the genetic conservation efforts at pan-European level.

Area managed for genetic resources

A total of 501,567 ha were managed for the *in situ* genetic conservation of forest trees in 38 countries in 2015. The total area managed for *ex situ* conservation is 11,553 ha in 37 countries; for seed production it is 1,027,434 ha in 38 countries. A total of 145 tree species (including subspecies and hybrids) were reported for this indicator. However, these species are not managed equally for genetic conservation (*in situ* and *ex situ*) and seed production. A large proportion of the trees targeted for *in situ* genetic conservation are widely occurring stand-forming tree species, which are important for forestry. A group of five economically relevant tree species (*Abies alba*, *Fagus sylvatica*, *Picea abies*, *Pinus sylvestris* and *Pinus pinaster*) alone account for 55% of the total area managed for *in situ* genetic conservation, while in the case of many other economically important tree species, only small areas are managed for the same purpose.

Furthermore, very few genetic conservation areas are managed for scattered tree species (e.g. *Populus nigra*, *Sorbus domestica*, *Tilia platyphyllosand*, *Ulmus laevis*), which are often considered of low importance. However, while these species may not be economically important, they have a high value in terms of maintaining forest biodiversity and ensuring ecosystem stability.

The assessment of the geographical representativeness of the *in situ* genetic conservation areas in Europe showed a clear need for the intensification of genetic conservation efforts. Significant gaps in genetic conservation exist, even in the case of common forestry species, for which large areas are managed for genetic conservation (see Figure 72 and 73). The geographical representativeness of the genetic conservation areas is considerably lower for most other tree species in Europe. These gaps mean that a large amount of valuable genetic resources are not managed for long-term genetic conservation.

Regarding *ex situ* genetic conservation, the collected data also reveal an imbalance in the efforts made for three species alone (*Pinus sylvestris*, *Picea abies* and *Quercus robur*), which account for 60% of the total *ex situ* genetic conservation areas in Europe. One exotic species, *Pseudotsuga menziesii*, is the fifth most important in terms of number of hectares, but accounts for just 3% of the area managed for *ex situ* genetic conservation in Europe.

Six stand-forming species (*Pinus sylvestris*, *Fagus sylvatica*, *Picea abies*, *Quercus petraea*, *Quercus robur*, and *Abies alba*) account for 60% of the total area managed for seed production. This indicates a strong emphasis on a very small number of economically important species in seed production.

Trends

Following the adoption of the Pan-European minimum requirements, which have been implemented by most European countries since 2010, it is possible to consistently analyse the trend for in situ genetic conservation areas for all European countries since 2010. Trends in ex situ genetic conservation and seed production can be examined between 1990 and 2015.

For the 34 countries that provided data in both 2010 and 2015, in situ genetic conservation between 2010 and 2015 displays some progress towards the conservation of the genetic resources of more tree species. In 2010, 74 % of the area managed for genetic conservation was composed of five economically important tree

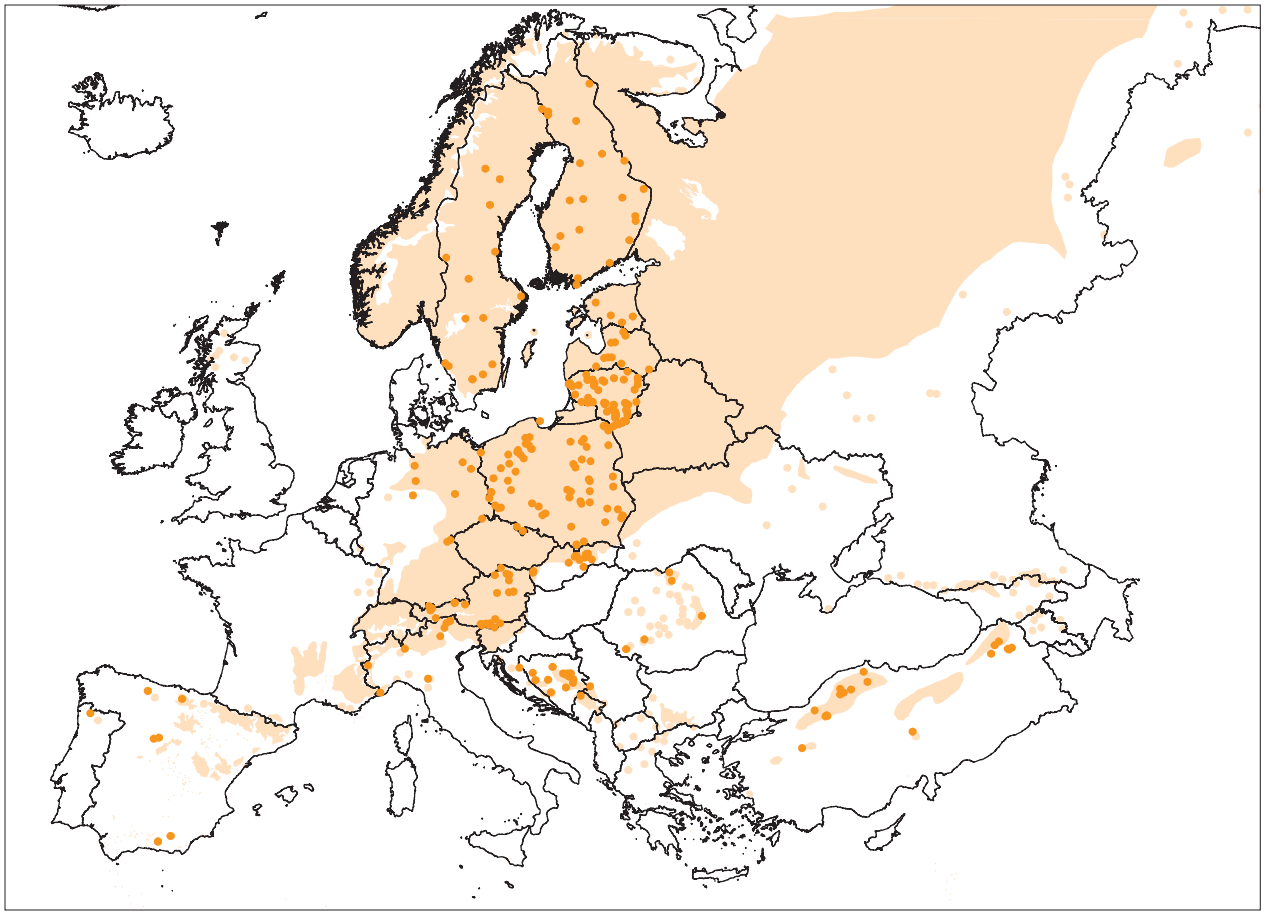


Figure 72. *Pinus sylvestris*: distribution range (shaded) and units managed for genetic conservation (dark dots). Data sources: EUFGIS Portal (http://portal.eufgis.org) and EUFORGEN (www.euforgen.org)

species, while in 2015 the same percentage included 12 species. In the case of many species, the *in situ* area declined in terms of hectares as a result of the harmonized definition. However, between 2010 and 2015, there was a considerable increase in the number of countries that have initiated conservation activities for new species and in the total number of genetic conservation units.

The areas managed for *in situ* conservation increased for 27 species (55%) and decreased for 19 species (39%). For 23 species, units were established in countries that did not conserve those species in 2010, representing a 50% increase in terms of the species.

The trend in areas managed for *ex situ* genetic conservation shows a continuous increase since 1990. The increase is more evident in Central-East Europe than the rest of Europe. While the total area managed for *ex situ* conservation tripled in the 28 countries that have reported data since 1990 (from 2,901 ha to 9,003 ha), it is possible to observe a general increase in the number of species conserved in each country. In the case of *ex situ* conservation, 67% of the countries reported an increase in the number of species conserved.

Based on the 26 countries that consistently provided data on the areas managed for seed production, it is possible to observe an increase from 672,160 ha in 1990 to 983,759 in 2015. It is also possible to note a greater focus on this activity in Central-East Europe (in terms of number of hectares managed for seed production), which alone accounts for around half of the European conservation effort.

In terms of the area managed for seed production for different species between 2010 and 2015, despite a noticeable reduction in terms of total number of hectares, there was an increase in the number of countries that established new areas for species not considered previously: 85% percent of the countries reported an increase in the number of species managed for seed production and a reduction can only be observed for three exotic species.

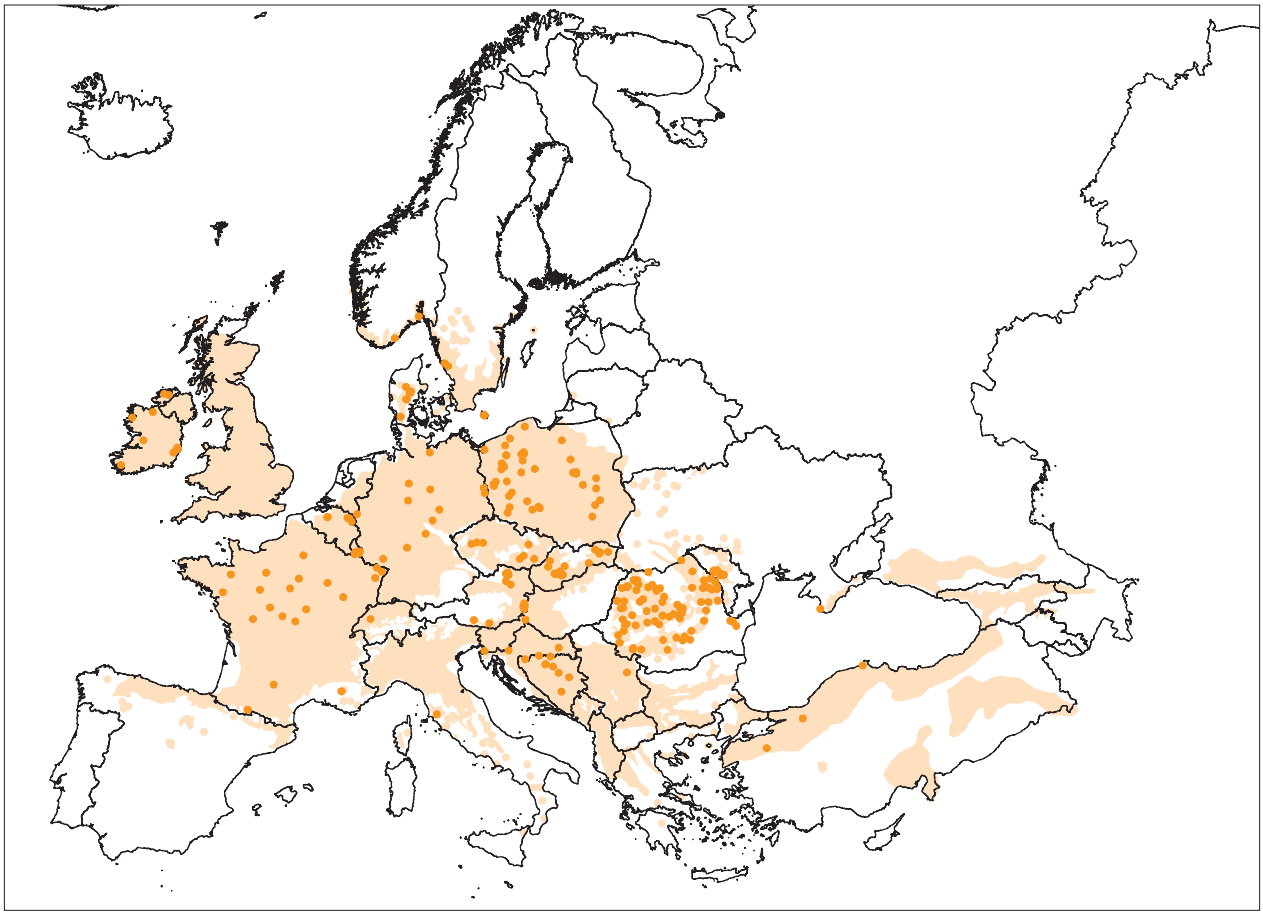


Figure 73. Quercus petraea: Distribution range (shaded) and units managed for genetic conservation (dark dots). (Data sources: EUFGIS Portal (http://portal.eufgis.org) and EUFORGEN (www.euforgen.org)

Indicator 4.7 Forest landscape pattern

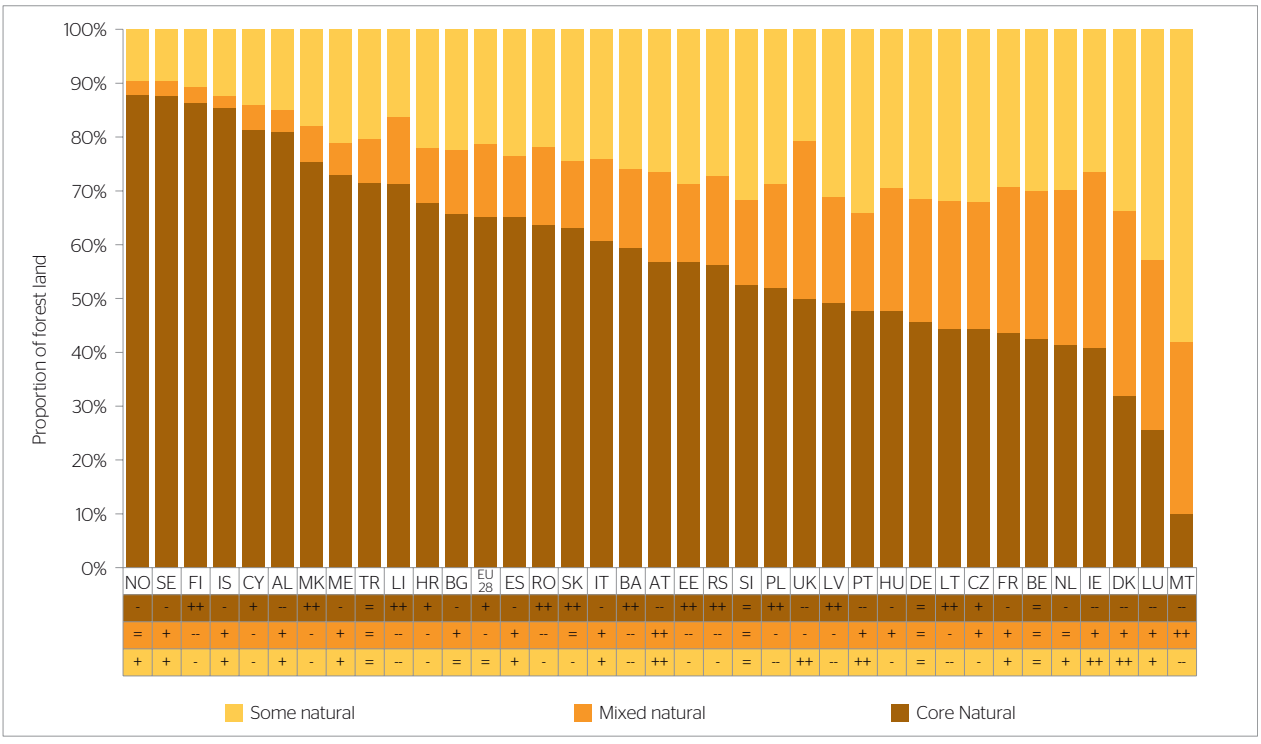
Introduction

The forest spatial pattern can be described by: (1) the spatial distribution of the forest cover; (2) the landscape mosaic composition in the forest surroundings, in terms how, by what and how much the forest cover is fragmented; and (3) the connectivity of forest cover, which also specifies how far apart forest areas are and which types of land separate them from the perspective of functional groups of forest species.

Fragmentation is mainly due to the expansion of agricultural areas, transport infrastructure and settlements. It may also be temporary and recoverable within forested land use areas following forestry operations such as cutting. Landscape patterns and their changes are important because they influence forest conservation and the provision of ecosystem services, such as habitat provision and disturbance regulation. They affect ecological processes, e.g. gene flow, pollination, wildlife dispersal and pest propagation, in different ways.

The area of forest in Europe increased in recent decades, mainly due to the planting of new forests and the natural expansion of forests onto former agricultural land. This increase is not homogeneously distributed and nationally aggregated area estimates do not provide an insight into the change in the forest spatial pattern following the cumulative impact of forest losses and gains. For example, new forest areas in a region can contribute significantly to habitat connectivity (e.g. woodland islets in the landscape acting as new stepping stones between isolated patches). Conversely, new forest areas may have minor impact on connectivity when they are planted too far from other woodlands or merely enlarge an existing patch.

Due to the poor availability and lack of harmonization based on a jointly agreed definition and assessment methodology, it has not been possible to evaluate the current situation and trends in forest patterns in Europe from national pattern data. For the purposes of this status report, a European-wide case study is presented. An integrated modelling framework based on four family indices is now available at the European Commission's Joint Research Centre (JRC). It was implemented to assess forest landscape patterns in a harmonized manner, and to measure progress in mitigating fragmentation and enhancing connectivity over the period 2000-2012. The proposed definition and methods represent an assessment scheme that is suitable for implementation at any scale in regions and in more complex implementation contexts, e.g. the entire European territory.



Source: European Commission Joint Research Centre (JRC); http://forest.jrc.ec.europa.eu/activities/forest-pattern-fragmentation

Figure 74. Country-based and Europe-wide forest cover shares of three fragmentation patterns in 2012 and trends in the period 2000-2012

How to read the graph: The graph shows how much forest per country displays a 'core natural' pattern, i.e. not fragmented and/or always adjacent to other natural/semi-natural lands, how much displays a 'mixed natural' pattern and is thus fragmented by agricultural and/or artificial land uses, but still in a predominantly natural context, and how much displays in a 'some natural' pattern whereby woodlands are strongly fragmented and embedded in a predominantly agricultural or artificial context. The countries and European Union are ranked per decreasing share of 'core natural' forest pattern in 2012. Below the chart, changes in shares over the period 2000-2012 are also shown for the three forest fragmentation patterns according to the following intervals: below -1% (--), between -1% and -0.1% (-), between -0.1% and 0.1% (=), between 0.1 % and 1 % (+) and above 1 % (++). Regardless of forest area changes, they highlight trends in the dynamics of fragmented patterns ('mixed natural' and 'some natural') versus the unfragmented pattern ('core natural'). The input data are from the Europe-wide Corine Land Cover maps for 2012 (preliminary version), 2006 and 2000.
Tha name of the countries in horizontal axix is abbreviated using ISO code (ISO 3166 alpha-2), except for Greece and the United Kingdom for which the abbreviations "EL" and "UK" are recommended. ISO 3166 MA also reserves "EU" for identifying the European Union.

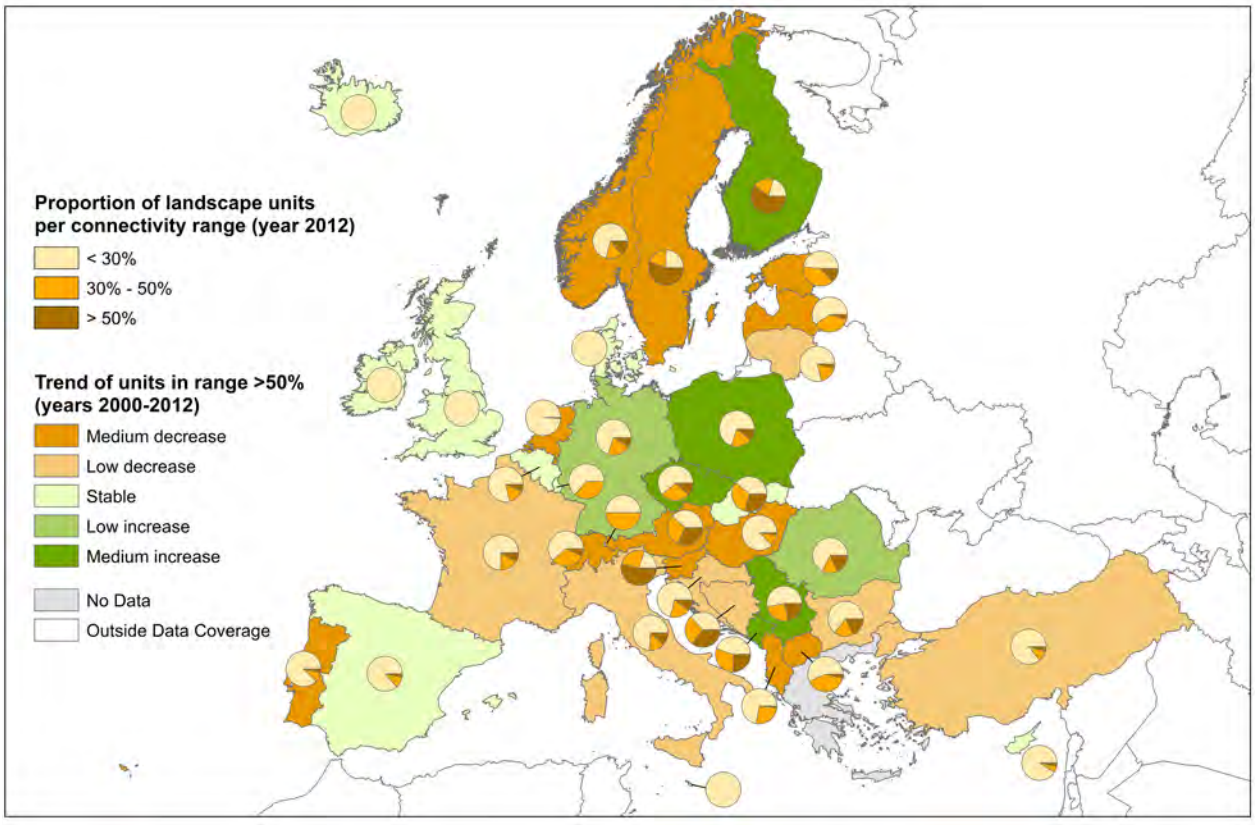
The available data and method

The assessment for year 2012 is based solely on the Corine Land Cover forest map (available for the years 2000, 2006 and, in its preliminary version, 2012). The assessed forests (with canopy cover of 30 %) include broadleaved, coniferous and mixed forests. This layer enables the observation of broad patterns of forest with a minimum mapping unit of 25 ha, however it tends to underestimate connectivity when compared with higher-resolution data. The high resolution European forest map for 2012 was not yet available for this report; by showing spatial details at a resolution of approximately one ha, this layer is able to capture fine-grained vegetation patterns like hedgerows and woodland islets, which are important for landscape permeability and forest connectivity.

Two measures were used: (1) The forest landscape fragmentation pattern measure which aims to identify where and how each hectare of forest land is surrounded by forest, natural/semi-natural lands, and fragmented by agricultural and/or artificial lands. It was calculated for a forest neighbourhood of 1 km^2 and three fragmentation patterns types were deduced (core natural, mixed natural, some natural). (2) The forest connectivity index which places greater emphasis on the forest patch size, distances and the permeability/suitability of the landscape between forest patches. It was calculated locally using landscape units of 25 km x 25 km for ecoprofiles of forest generalist species with median dispersal capability of 1 km. Three connectivity ranges for the forest in the landscape were deduced (poorly connected, intermediate, highly connected).

Status and trends 2000-2012: Forest connectivity

In 2012, 65% of the European forest lands were in a 'core natural' landscape pattern, meaning that they were not fragmented or were always adjacent to other natural/semi-natural lands. 35% were in a mixed pattern of natural, agricultural and artificial lands; more than half of them (22%) appeared as 'only some forest' embedded in predominantly agricultural and artificial landscape and the remaining 30% were located in a mixed but still predominantly natural context. On average in Europe, and for half of the countries between 2000 and 2012, the forest shares in a 'core natural' pattern tended to



Source: European Commission-Joint Research Centre (JRC); http://forest.jrc.ec.europa.eu/activities/forest-pattern-fragmentation

Figure 75. Country-based landscape forest connectivity: status in 2012 and trend in the period 2000-2012 for generalist forest species with a dispersal of one km

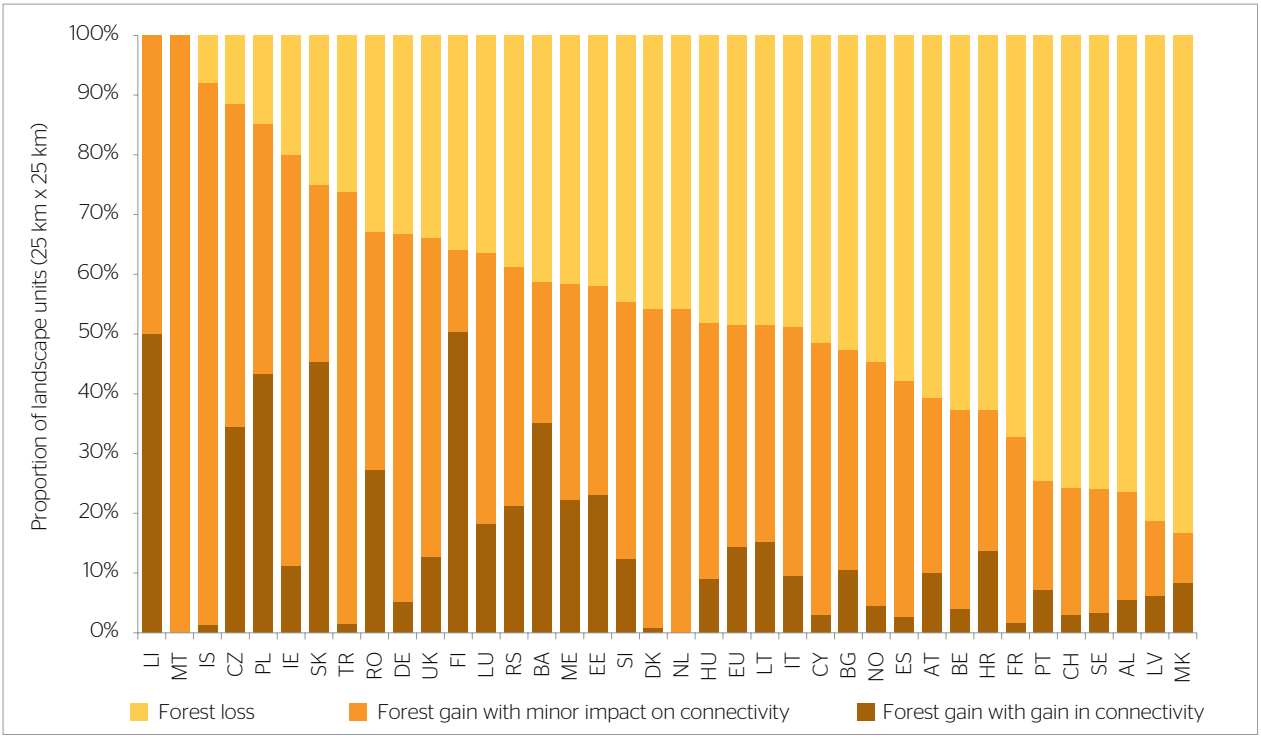
How to read the map: The index of forest connectivity is calculated per landscape unit of 25 km x 25 km. The pie-chart indicates the proportion of landscape units in three connectivity ranges (landscape with forest poorly connected for an index below 30%, intermediary, highly connected for an index above 50 %) for 2012 in each country. The index varies between 0 % and 100 % (all forest with maximum connection and no fragmentation), the spatial arrangement of the forest, in particular inter-patch distances and patch sizes, and the dispersal capacities of species (one km median dispersal of general forest species for this figure). The index was also computed per landscape unit for year 2000. The trend (medium/low increase/decrease or stable) of the proportion of units in the high connectivity range (above 50 %) is indicated for the period 2000-2012 per country. The input data are from the Europe-wide Corine Land Cover maps available for 2012 (preliminary version), 2006 and 2000. Example: Estonia and Lithuania, two countries with the same amount of forests (2.2 million ha), exhibit a different landscape distribution per connectivity ranges (81 % of landscapes with poorly connected woodlands in Lithuania versus 51 % in Estonia). In the period 2000-2012, landscapes with highly connected forest lands tended to decrease in both countries, but more significantly in Estonia.

increase due to natural expansion of forests and newly planted forests. Less forest fragmentation by (mainly) roads and agriculture probably explained the slowdown of the development towards a mixed landscape mosaic pattern.

Status and trends 2000-2012: Forest connectivity

In 2012, over 60 % of the European Union comprised landscapes with poorly connected woodlands for forest generalist species with a median dispersal distance of 1 km. In most countries, the number of landscape units with highly connected forest was either stable or decreased in the period 2000-2012.

Between 2000 and 2012 in Europe, only one third of the landscapes with a forest area increase, acknowledged also a significant increase in forest connectivity. This was due to the cumulative facts of enlarged forest patches, reduced distance and enhanced landscape permeability between forest patches. This finding supports the need to account for forest connectivity to provide better guidance for conservation and restoration efforts. This would be valuable for forest planning and monitoring, also in the context of the European Green Infrastructure strategy.



Source: European Commission Joint Research Centre (JRC); http://forest.jrc.ec.europa.eu/activities/forest-pattern-fragmentation

Figure 76. Country-based forest area changes and impact on connectivity for generalist forest species with a dispersal of one km in the period 2000-2012; insight into landscapes with a net forest area gain

How to read the graph: Countries are ranked per decreasing proportion of landscape units (25km x 25 km) with a forest area gain. The input data are from the Europe-wide Corine Land Cover maps available for 2012 (preliminary version), 2006 and 2000. Example, in the Czech Republic, forest area increased in nearly 90 % of the landscapes; this area gain enhanced significantly the connectivity of forests for less than half of them; otherwise it had only a minor impact (and probably only increased forest patch sizes).
Tha name of the countries in horizontal axix is abbreviated using ISO code (ISO 3166 alpha-2), except for Greece and the United Kingdom for which the abbreviations "EL" and "UK" are recommended. ISO 3166 MA also reserves "EU" for identifying the European Union.

Indicator 4.8 Threatened forest species

Number of threatened forest species, classified according to the World Conservation Union (IUCN) Red List categories, in relation to total number of forest species

Introduction

The most noticeable form of biodiversity depletion is the loss of plant and animal species. Slowing down the rate of species extinction due to anthropogenic factors is a key objective of biodiversity conservation. This is very much reflected in the corresponding international, European and national initiatives and actions. Examples of these include the Convention on Biological Diversity, the European 2020 targets, which were agreed on at the FOREST EUROPE Ministerial Conference in Oslo 2011, the EU Biodiversity Strategy 2020, and national and regional biodiversity strategies which express their ambitions through set targets (link to Indicator B6). It is further highlighted by the fact that threatened forest species are seen also as indicators of change in forest ecosystems.

According to the IUCN Red List categories, a species is listed as threatened if it falls within one of the following categories: 'critically endangered', 'endangered' or 'vulnerable'. A forest species is regarded as one that is dependent on a forest as its habitat, for either part or all of its requirements for day-to-day living or reproduction. Hence, an animal species may be considered a forest species even if it does not actually spend most of its life in a forest.

The relationships between threatened species, forest composition and habitat structures are complex but often of crucial importance. However, threats to a certain species can often be the result of multiple factors, making it difficult to determine clear causalities. In particular, the required amount and quality of deadwood is a topic that requires continuing research support. Many species are dependent on small key biotopes, habitats or habitat structures available in both protected forest areas and managed forests. To provide science-based input for raising awareness of the need to integrate biodiversity considerations into forest management, further attention needs to be focused on these elements by research and monitoring.

Data availability

The compilation and presentation of data for different species groups is a highly demanding and time-consuming task. The data obtained from the questionnaire survey form the basis for the analysis. The requested information includes numbers of threatened forest species and their relation to the total number of forest species for trees, birds, mammals, other vertebrates, invertebrates, vascular plants, and cryptogams and fungi. In terms of the reporting countries, the data coverage is most extensive for threatened forest-occurring tree species, followed by mammals, birds and vascular plants. It is less extensive in relation to the number of other vertebrates, invertebrates and fungi.

In total, 30 countries reported data for threatened forest-occurring species in at least one of the organism groups for the 2015 assessment (including '0' values). This indicates a slight increase compared with previous assessments (27 countries reported in 2011) and covers around 80% of the forest area in Europe. However, information is still lacking in countries of the South-East, South-West and Central-East Europe regions. Thus, only a partial picture is provided of threatened forest-occurring species in those regions. The best covered category is in all regions that of threatened forest-occurring tree species.

On closer examination, the country data appears to be rather heterogeneous. For several countries, the data reported for the 2015 assessment are identical to those provided for 2011 and even earlier reporting years. While some countries presented detailed inventories for forest and threatened species (Red Lists), others were only able to provide either incomplete or fragmentary information, or have designated all or certain IUCN categories as "data not available". In many cases the information is derived from national classification systems rather than the IUCN Red List. Furthermore, secondary sources are used and the data are often estimated due to the lack of quantitative measurements. The reliability and accuracy of the information can vary, depending on both the quality and coverage of the available data. This also applies to the assessment of the risk of a species becoming threatened.

In general, species diversity is higher in South Europe than in North Europe. However, forest-occurring species are proportionally more abundant in the North and in countries with extensive forest cover. Therefore, comparisons of absolute numbers between countries are not always meaningful. Also, if the total number of forest-occurring species is related to the unit area, i.e. divided by the area of forest land in a country, small countries may emerge as more species-rich. If Europe as a whole is considered, the situation of threatened forest species may differ and probably appears more positive than when individual countries are considered. For example, species that have a limited distribution in one country may be classified as threatened while they may be more widespread at European level.

Status

28 of 45 countries reported data for threatened forest-occurring tree species (Table 46). Those countries represent around three quarters of the total European forest area. The number of threatened forest-occurring tree species generally ranges between 1 and 9. 4 countries reported more than 10 species as threatened (Figure 77). The largest number was reported for Albania (32). Notable figures were also indicated for the Czech Republic, United Kingdom, Austria and Sweden. 5 countries indicated that they have no threatened forest-occurring tree species. The percentages of threatened forest tree species as compared to the total number of forest tree species in individual countries is highlighted in Table 47.

Sweden reported that 2 widespread tree species, *Fraxinus excelsior* and *Ulmus glabra*, are categorized as threatened. Their decline is caused by ash dieback and

Table 46. Numbers of threatened[2] forest-occurring tree species, birds, mammals, other vertebrates, other invertebrates, vascular plants and fungi (number of reporting countries: 30)

Country	Tree species	Birds	Mammals	Other vertebrates	Other invertebrates	Vascular plants	Fungi
Albania	32	-	-	-	-	-	-
Austria	11	18	13	18	-	267	97
Belarus	3	57	14	13	75	153	105
Belgium	4	-	13	4	-	34	-
Bulgaria	0	12	8	17	6	0	0
Croatia	3	26	5	1	11	32	257
Cyprus	4	6	1	2	-	102	-
Czech Republic	15	248	31	47	-	771	582
Denmark	6	20	9	6	372	54	818
Estonia	2	12	2	1	5	37	36
Finland	5	13	8	2	599	48	337
France	5	20	5	2	6	512	-
Germany	7	14	-	-	-	208	1475
Hungary	9	2	0	0	5	264	166
Iceland	1	0	0	-	-	1	-
Ireland	1	3	1	-	10	7	2
Italy	2	16	21	3	-	-	-
Latvia	3	19	9	2	46	76	28
Liechtenstein	0	-	-	-	-	-	-
Lithuania	0	0	2	-	4	-	-
Netherlands	0	0	0	0	0	0	0
Norway	0	10	9	0	571	43	501
Slovak Republic	8	20	22	30	644	242	100
Slovenia	2	43	23	30	227	-	82
Spain	3	44	17	32	21	142	-
Sweden	7	12	8	3	373	57	525
Switzerland	3	29	23	85	85	109	981
Turkey	-	-	4	-	-	-	-
Ukraine	-	95	69	88	290	500	148
United Kingdom	13	0	0	0	51	29	79

[2] Threatened forest-occurring species include the IUCN Red List categories "vulnerable", "endangered" and "critically endangered".

Dutch elm disease respectively. In the United Kingdom, all of the country's 13 *Sorbus* species are listed as threatened. Hungary differentiated its 9 threatened tree species by endangerment category with *Alnus viridis* being specified as vulnerable, *Taxus baccata* as endangered and *Pyrus magyaricaas* critically endangered. *Abies nebrodensis* and *Zelko vasicula* are critically endangered in Italy. 4 tree species in total were designated as extinct in the wild: 2 in Belgium and 1 in Albania and Hungary.

An overview of the distribution of forest-occuring tree species, which were classified under the IUCN Red List categories, shows that around 30% are classified as vulnerable, 49% are considered endangered and 18% as critically endangered (Figure 78). This also includes trees that are growing at the limits of their potential range. The threatened tree species do not include economically important and abundant tree species for wood production but may have a considerable value in terms of biodiversity.

Table 47. Threatened forest tree species in % of total forest tree species in individual countries (number of reporting countries: 19)

Country	Threatened forest tree species in % of total number of forest trees
Bulgaria	0.0%
Liechtenstein	0.0%
Lithuania	0.0%
Italy	1.7%
Belarus	1.9%
Spain	2.0%
Slovenia	2.7%
Croatia	4.4%
Czech Republic	5.4%
Switzerland	6.5%
Estonia	7.4%
Belgium	8.0%
Germany	8.8%
Cyprus	11.1%
Finland	16.1%
Hungary	17.0%
Denmark	17.1%
Austria	21.6%
Sweden	23.3%

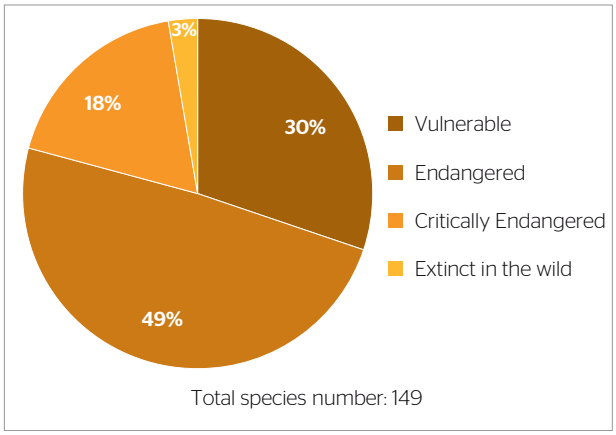


Figure 78. Share of vulnerable, endangered, critically endangered and extinct forest tree species of the total number of threatened forest-occurring tree species

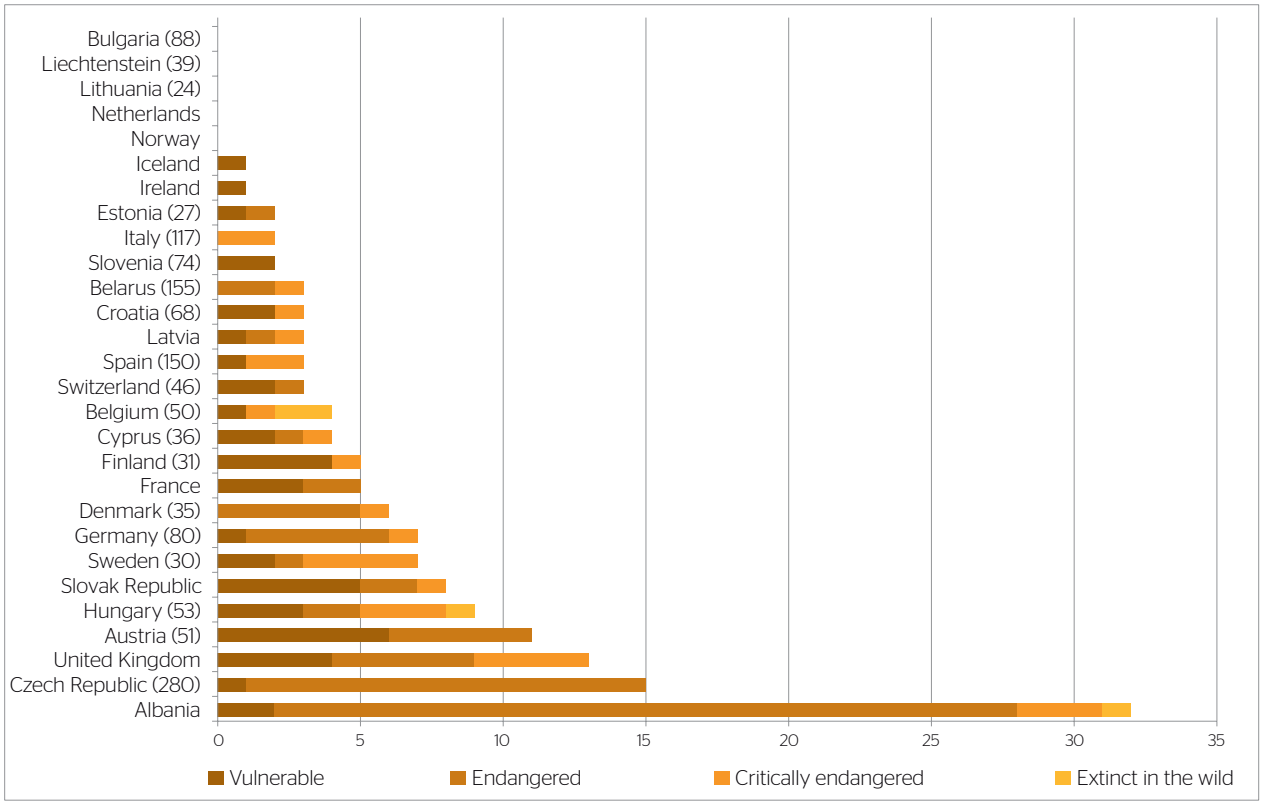


Figure 77. Number of threatened forest-occurring tree species, classified according to IUCN Red List categories (including 'extinct in the wild'). Note: The figure in brackets after the country name indicates the total number of forest-occurring tree species in a country where provided (number of reporting countries: 28)

The total number of extinct forest-occurring species reported for 2015 is lowest for tree species while higher numbers were reported for other organism groups with greater species diversity. Fungi, other invertebrates and vascular plants are the organism groups with the highest total number of extinct forest-occurring species (Table 48). On the other hand, some countries that have been making efforts to preserve species from extinction or re-colonize extinct species were able to report positive results. Austria, for example, noted the return of the wild cat which was previously extinct in its forests.

Next to the threatened forest-occurring tree species, mammals and birds are the species for which most data are available. Around half of the 45 reporting countries provided information for the remaining categories. Due to the high number of threatened forest birds reported for the Czech Republic (248), the most noticeable number is found in Central-East Europe (422). Other regions range between 59 and 80 threatened forest-occurring birds. For example, Italy listed 2 species, one of which is critically endangered (*Columba oneas*) and a second that has become extinct (*Aegypius monachus*).

The highest number of threatened mammals is reported for the Central-East Europe region (129, of which 17 are critically endangered); however, country coverage for that region is rather limited. Information is particularly lacking in countries of South-East and South-West Europe, thus providing only a partial picture in relation to threatened forest-occurring mammals. The best covered region is North Europe (100% of the forested area) where the number of threatened mammals ranges from 1 in Estonia and 9 in Denmark, Latvia and Norway.

The highest absolute numbers of threatened vascular plants are recorded for the Czech Republic, (711), France (512) and Ukraine (500). With respect to individual regions, Central-East Europe (1,902, with 5 of 9 countries reporting) and Central West Europe (1,152, with 8 of 10 countries reporting) report the highest numbers of threatened vascular plant species occurring in the forest.

23 out of 45 countries reported figures for other threatened vertebrates and 20 countries reported on other invertebrates and fungi. This represents an increase in coverage compared to earlier assessments. Very few countries in South-West Europe continue to provide information. North Europe has the most complete data coverage for these groups with noticeable number of 'other invertebrates' (1,853) and 'fungi' (2,184) designated as threatened. In Central-West Europe, in particular, Germany reported 1,475 fungi species as threatened, which represents an increase of more than 10% compared to the number reported for the previous assessment. For other invertebrates, Slovak Republic designated 644 species as threatened; no information was available was available on this category in previous assessments.

Trends

The reporting situation has developed positively with more countries providing information than for earlier assessments. However, the data on threatened forest-occurring species by country are still heterogeneous and sometimes fragmentary. Thus many of the reporting countries stated that trend analyses should be avoided.

An increase in the number of threatened species may not necessarily indicate a loss of biodiversity. For example, an increased number of vulnerable or endangered species can reflect either a real deterioration in the situation or an improvement in the scientific knowledge on species, the implementation of more comprehensive surveys and the availability of better mapping tools for species distribution. Furthermore, while the number of threatened species may have risen in one organism group within a particular country, successful measures may have been implemented in another to prevent it from becoming threatened or even extinct. In addition to the designation of protected forest areas, forest management practices are developing towards the greater integration of biodiversity issues. Such integrated forest management approaches may give rise to improved habitat conditions for threatened species e.g. through increasing the amount of standing and lying dead wood, designating stepping stones and habitat trees, and preserving habitat structures and allowing for their development. However, the effects of biodiversity-oriented forest management practices will become evident only with time. Therefore, in addition to such long-term commitments, the continuation of efforts in relation to the monitoring of the development of threatened forest-occurring species will be crucial.

Table 48. Numbers of extinct forest-occurring tree species, birds, mammals, other vertebrates, other invertebrates, vascular plants and fungi by regions, EU 28 and Europe (number of reporting countries: 45)

Region	*Trees*	*Birds*	*Mammals*	*Other vertebrates*	*Other invertebrates*	*Vascular plants*	*Fungi*
North Europe	0	6	2	1	117	9	61
Central-West Europe	2	5	6	5	4	14	214
Central-East Europe	1	0	7	3	13	28	39
South-West Europe	0	1	0	0	0	0	0
South-East Europe	1	10	4	1	16	12	0
EU 28	3	21	12	3	145	48	300
EU 28 (number of countries reporting)	19	20	20	18	16	16	15
Forest area of EU 28 covered (in %)	73	74	67	65	63	63	55
Europe	4	22	19	10	150	63	314
Europe (number of countries reporting)	25	25	25	21	17	19	18
Forest area in Europe covered (in %)	61	66	66	59	53	52	52

Indicator 4.9 Protected forests

Protected forests: Area of forest and other wooded land protected with the aim of conserving biodiversity, landscapes and specific natural elements in accordance with the MCPFE Assessment Guidelines

Introduction

Protected areas are one of the oldest instruments for conserving nature and natural resources, and constitute a main pillar of nature conservation laws across Europe. Explicitly designated protected areas focus mainly on conserving biological diversity, landscapes, natural monuments and the protective functions of forests.

Status

Information was provided by over 22 countries in accordance with the Assessment Guidelines. In some cases, countries could provide data for forest only and not for other wooded land. The area of forests and other wooded land was used as a basis for the European scale calculations. In cases where countries did not provide data on forest and other wooded land, the data for forest area was taken into account. The area protected for biodiversity in Europe totals around 29.9 million ha. This is equivalent to 12.2% of the European forest area (Table 49 and Figure 79 and 80).

Within the area of forest protected for biodiversity in Europe, the share (7.6% of forest area) for the category "active conservation management" (MCPFE class 1.3) is highest. The share (1.5% of the forest area) for the strictest category "no active intervention" (class MCPFE 1.1) is very low (Table 49).

The size of forest area protected for biodiversity varies considerably between the European countries. In addition, very clear differences can be observed between the countries in relation to the shares applicable for the subclasses (MCPFE 1.1–1.3), i.e. the strictness of management for biodiversity (Figures 80 and 81). The forest area protected for biodiversity (all MCPFE classes 1.1–1.3) is highest in Spain, Italy, Finland and Sweden.

Of the total area protected for biodiversity in Europe, at over half (two million ha), the largest forest area with no active intervention is located in Finland. Sizeable areas of over 100,000 ha with no active intervention can also be found in Italy, Estonia, Sweden and Belarus.

The largest forest areas with minimum intervention (MCPFE Class 1.2) that are protected for biodiversity are located in Italy, Sweden, Spain and Norway.

Large forest areas of active conservation management for biodiversity (MCPFE Class 1.3) can be found in Italy, Belarus, Finland and Portugal. Germany (3.1 million ha, for 2010) and Spain (4.8 million ha) also reported large forest areas with active conservation management for biodiversity, however, according to the explanatory country information, both countries included all forest areas where Natura 2000 sites are located in MCPFE class 1.3. In Germany, these areas are partly located outside the legally protected forest areas. Spain reported some Natura 2000 areas in Class 1.3 and also included all of the large forest areas containing Natura 2000 sites in the MCPFE Class 2 "landscape protection".

The differences in management reported for the protection for biodiversity reflect the various approaches adopted to forest protection: whereas Central, North-West and South European countries stress active management for biodiversity depending on forestry conditions, the Nordic/Baltic and East European countries focus strictly on protection.

The forest protection for "landscape and specific natural elements" (MCPFE class 2) supports the conservation goal of biodiversity, in particular by protecting special natural elements. However, this objective is principally aimed at achieving the goals of landscape diversity, cultural, aesthetic, spiritual and historical values, and recreation. In some cases this class also includes Natura 2000 areas. In general, commercial forestry is possible in these areas as long as it complies with the primary objective of landscape protection. Therefore, the results are described separately from the protected areas for biodiversity (MCPFE classes 1.1–1.3), whose principal conservation goal is strictly biodiversity.

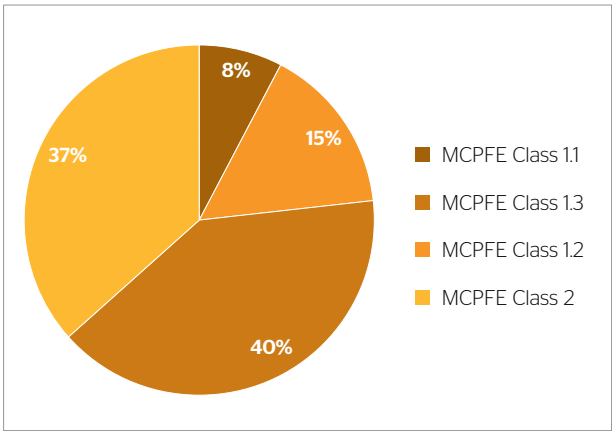


Figure 79. Share (percentage) of MCPFE classes 1.1–1.3 (1.1 no active intervention, 1.2 minimum intervention, 1.3 conservation through active management) and 2 (landscape protection) of the protected forest area in Europe, 29.9 million ha in 2015 (based on available data)

Up to 2015, around 17.3 million ha or 7% of forest and other wooded land in Europe, was protected for landscape and specific natural elements (Table 49).

Landscape protection prevails mainly in Central and West European countries. The countries with the highest proportion of landscape protection areas (over 15% share of the total forest area) are Germany, Portugal, Slovak Republic, Czech Republic, Switzerland, France and Hungary. The size of the landscape protection area in countries with a high proportion of boreal forests in the landscape and low population density, e.g. Finland, Sweden and Norway is very small.

Table 49. Area of forest and other wooded land protected (million ha) and percentage of protection (percent) for biodiversity (MCPFE Classes 1.1–1.3) and landscape (MCPFE Class 2) in Europe, 2015 (based on the available data; where on forest and other protected wooded land were not available, data for protected forest were used in the calculations)

	Europe	
Management objective	million ha	% of total forest area
Biodiversity, MCPFE categories 1.1–1.3	29,9	12.2
1.1 No active intervention	3,6	1.5
1.2 Minimum intervention	7,3	3.1
1.3 Conservation through active management	19,0	7.6
Landscape, MCPFE Category 2	17,3	7.2
Total – Biodiversity and Landscape combined	47,2	19.4

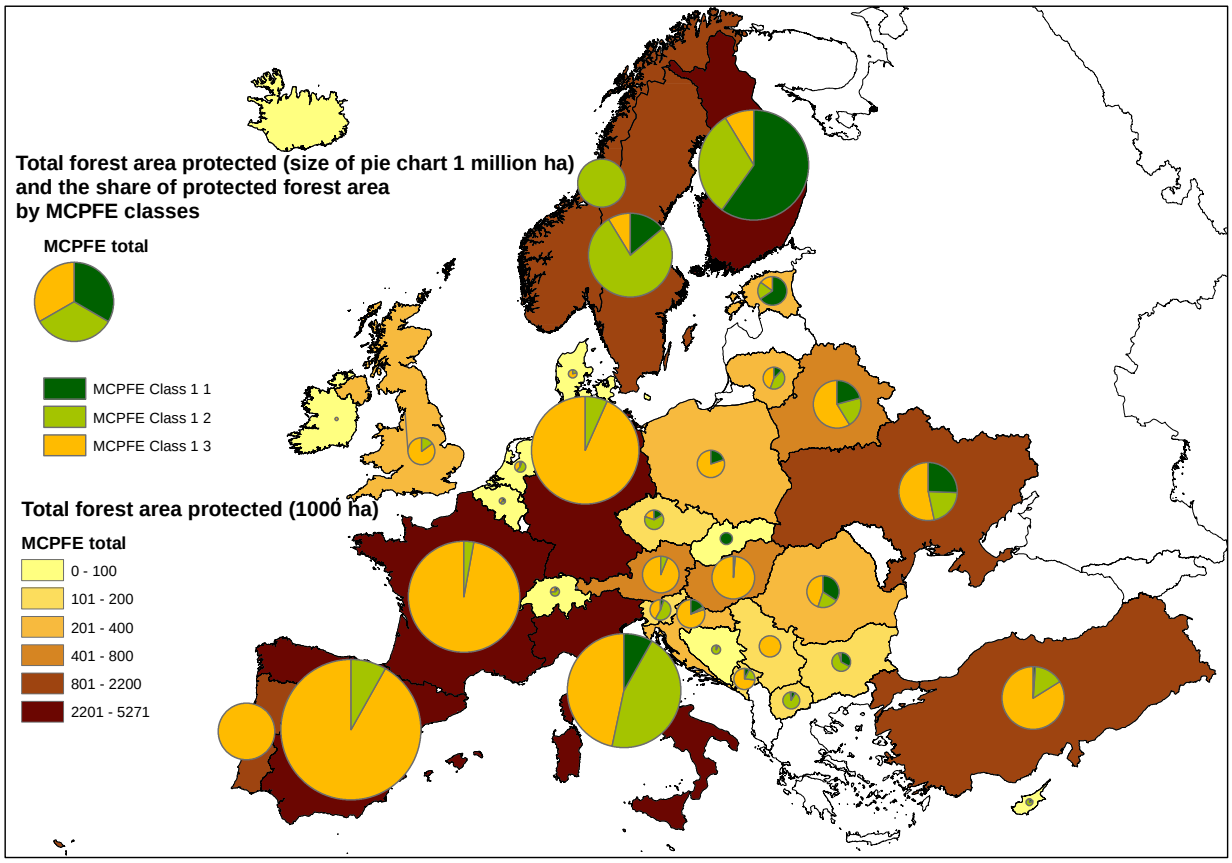


Figure 80. Total protected forest area and share of the protected area by MCPFE classes 1.1–1.3 (1.1 no active intervention, 1.2 minimum intervention, 1.3 conservation through active management) for biodiversity by country in Europe, 2015 (based on available data; where data were not available on forest and other protected wooded land, data for protected forest were used in the calculations)

Trends

It was possible to analyse the changes in the area of protected forests using data from 2000, 2005, 2010 and 2015; however, it was not possible to reconcile the situation in 1990 in the countries with the MCPFE classes. A clear trend involving an increase in the area of forests protected for biodiversity and landscape in Europe can be observed over the last 15 years (Figure 82). The figures indicate, in particular, that the protected forest area with active management for biodiversity (MCPFE classes 1.2 and 1.3) has increased. The area of strictly protected forest areas (MCPFE 1.1) did not increase significantly between 2015 and 2010. This may be explained by countries being aware of the most important, rare and vulnerable forest areas and having already segregated the protected areas without human impact.

The area of protected forests for biodiversity and landscape in Europe increased by around 500,000 ha annually over the last 15 years.

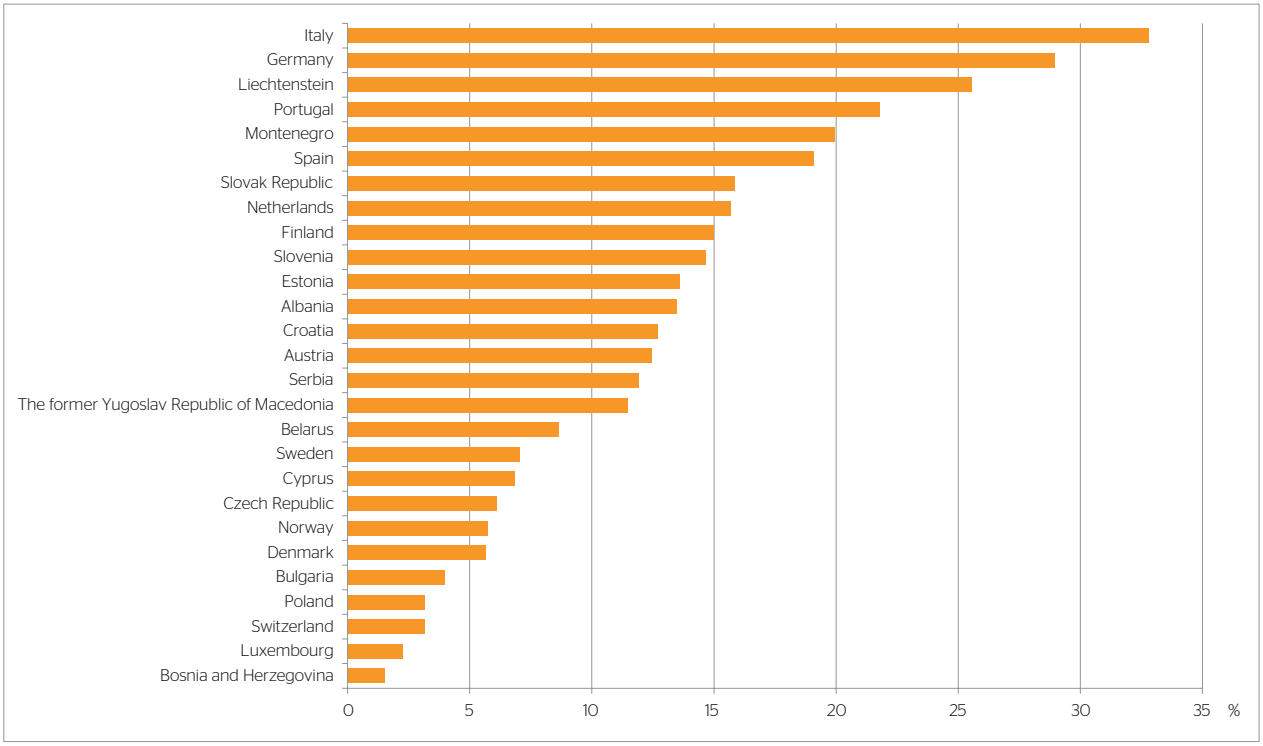


Figure 81. Total forest area protected (1,000 ha) by MCPFE Classes 1.1–1.3, for 2015 (based on available data). Data for Germany and Switzerland based on data for 2010

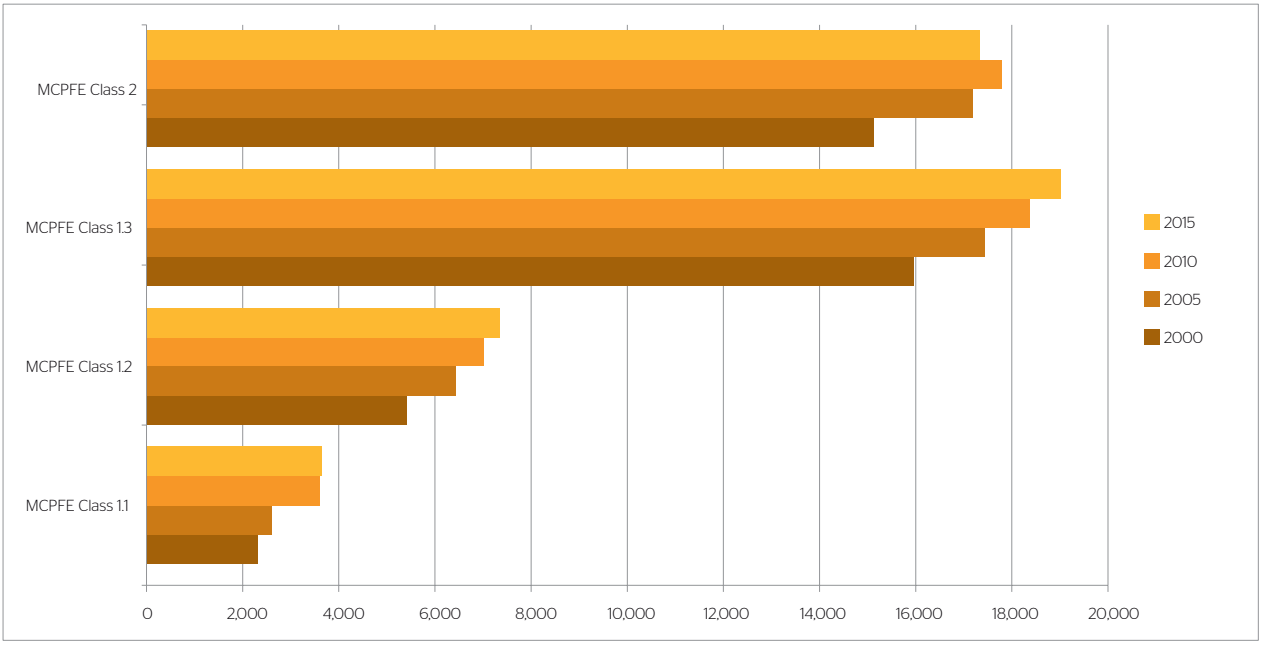


Figure 82. Area of protected forest (1,000 ha) in Europe by MCPFE class (1.1–1.3 and 2) in 2000, 2010 and 2015 (based on available data)

Qualitative Indicator

Indicator B6 Biodiversity

Biodiversity remains an important area of engagement for sustainable forest management and forest policy with significantly different strategies reported by the states in Europe

Status, trends and main changes in policy objectives since SoEF 2011

90% of reporting signatories have specific objectives in relation to biodiversity that have remained stable since the last reporting period

Biodiversity remains an important dimension of forest management in Europe. The majority of reporting signatories (31 of 34) reported specifically formulated policies (objectives) in relation to biodiversity. The key objectives and instruments of these policies are:

- To increase protected forest areas (Albania, Belgium, Latvia, Luxemburg, Montenegro, Norway), inter alia in conjunction with the implementation of Natura 2000 network of protected areas under the European Union's Habitats and Birds Directives (Bulgaria, Croatia, Hungary, Italy, Slovak Republic, Slovenia, Serbia).
- To practise multifunctional or close-to-nature forest management (many countries).
- To protect rare and endangered species and deal with issues relating to invasive alien species (Austria, Cyprus, Czech Republic, Finland, Italy, Latvia, Romania, Switzerland, United Kingdom).
- To protect forest genetic resources (Bulgaria, Italy, United Kingdom).
- To preserve natural environments of cultural or aesthetic value (Estonia, Sweden).
- To improve knowledge about forest biodiversity and management through research and communication (Germany, Iceland, Latvia) and also (new) monitoring (Austria, Turkey).

Overall, biodiversity-related forest policy objectives remained stable compared to the previous reporting period; the reported changes (11 of 34 countries) refer to one of the above-listed objectives and instruments. Regarding protected forest areas, several countries have adopted quantified objectives which differ significantly with regard to the quantity and qualification of the protection status (e.g. Albania plans for 25% of its forests designated as protected areas by 2020; in Luxemburg 5% of public forests shall be 'total reserves' in the future).

Only 6 out of 34 reporting signatories submitted responses on key lessons learnt with most of them referring to better performance regarding biodiversity conservation and/orthe better integration of biodiversity conservation into forest management. Some of the most prominent examples include: the integration of Natura 2000 and other forest biodiversity requirements into forest management practice (Slovenia) and the enhancement of cooperation between foresters and conservationists as current disputes are counter productive (Slovak Republic).

Institutional framework

Continuity in institutional frameworks for most reporting countries

Regarding institutional frameworks, around 25% of the signatory countries reported changes. Changes were mostly related to general administrative reforms in the forest and environmental sector. Turkey reported the establishment of a Biodiversity Division in the Non-Wood Forest Products and Services Department.

Legal/regulatory framework and international commitments

Half of the signatories reported changes, most of which were driven by the implementation of the Natura 2000 networking programme

Regarding the policy mix applied for the governance ofbiodiversity-related management in forests, regulatory instruments play an essential role. In total, 15 of 34 reporting signatories reported changes regarding the legislative framework, relating specifically to:

- the adoption and amendment of national legislation in relation to Natura 2000 (Belgium, Montenegro, Croatia, Hungary);
- the development of national programmes/strategies on the protection and reproduction of forest tree species and/or biodiversity in general (Czech Republic, France, Romania, Spain);
- compensation mechanisms for biodiversity conservation, primarilyrelating to Natura 2000 (Belgium, Hungary, Slovak Republic, Sweden).

In general, the EU's biodiversity policy and, specifically, Natura 2000 appear to provide an important trigger for legal changes in the European countries, in particular in the 'new' EU Member States in Central and Eastern Europe and also in EU accession countries.

Financial instruments and economic policy, and informational means

Few changes reported regarding financial and informational means

Few changes are reported regarding financial (25 of 34 countries report no change) and informational (26 of 34 countries report "no change") instruments relating to biodiversity conservation and management in forests. With regard to financial instruments, a few countries report changes relating to compensation mechanisms, e.g. for Natura 2000 forest sites. For example, Hungary introduced Natura 2000 payments for 120,000 hectares to improve the management of privately owned forests protected under the EU network of protected areas.

Regarding informational instruments, only 4 countries reported new developments that are specifically relevant to biodiversity and forests. These involve, for example, annual forest communication plans (Finland), the use of social media (Austria) and new publications (e.g. on the protection of animal species, Luxembourg).

Selected objectives of the EU Biodiversity Strategy to 2020 of relevance to forests:

1) Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible.

2) Putting forest management plans or equivalent instruments in place for all forests that are publicly owned and for forest holdings above a certain size so as to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 baseline.

3) Fully implementing the Birds and Habitats Directives with a view to improving conservation status through the implementation of 100 percent more habitat assessments and 50 percent more species assessments under the Habitats Directive and establishing secure or improved status through the implementation of 50 percent more species assessments under the Birds Directive.

Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably Soil and Water)

Coordinating Lead Authors: Quantitative Indicators: Jesús San-Miguel Ayanz
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Qualitative Indicators: Indicator B7: National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator 5.1 Protective forests – soil, water and other ecosystem functions

A considerable number of forests, i.e. about one fifth of the forest and other wooded land area in Europe, are reported as serving the protection of water supplies, the prevention of soil erosion and the provision of other important ecosystem services. Although the mechanisms for ensuring and safeguarding these services may vary, the importance of these functions is clearly recognized. Due to the variability in the interpretation of the indicator, trends over time need to treated with caution.

Indicator 5.2 Protective forests - infrastructure and managed natural resources

Around 3.3 million hectares, or 1.5% of the European forest area, are designated for the protection of infrastructure and managed natural resources against natural hazards. The protective role of forest often covers a wide range of areas, including infrastructure, managed natural resources, and other services, such as water, soil and ecosystems. Countries that provide data usually have mechanisms in place for identification or designation of forests with these protective functions. They are especially relevant in countries with mountainous terrain, for example Switzerland, Austria and Poland. The data available for trend analyses are very limited and should be treated with caution as a varying number of countries have been reporting on this indicator over time and changes may have arisen in the survey methodology or policies applied.

Qualitative Indicator

Indicator B7 Protective forests and other wooded lands

The main policy objectives relating to the protective functions of forests, namely the protection of soils, water resources and biodiversity, have remain unchanged since 2007. This is indicative of the long-term commitment to maintaining and enhancing the protective functions of forests. Most of the reporting signatories identified soil protection as a main policy objective, with particular attention being paid to the mitigation and prevention of soil erosion; around one third of the countries identified the protection of water resources as a priority. The existing institutional regulatory frameworks, financial instruments and informational means provide a solid basis for the implementation of the related policies.

Indicator 5.1 Protective forests – soil, water and other ecosystem functions

Area of forest and other wooded land designated to prevent soil erosion, to preserve water resources, or to maintain other forest ecosystem functions, part of MCPFE Class "Protective Functions"

Introduction

Forests can play a vital role in preventing soil erosion, protecting water supplies and maintaining other specific ecosystem functions. Measures are in place in some countries for either recognizing or safeguarding these specific functions. Such measures may include the restriction or enhancement of certain management practices and the zoning of forests. Forest designations are administrative in nature or the result of decisions made in the context of land-use and forest management planning.

Status

In 2015, 35 countries provided information on forests in relation to the prevention of soil erosion, preservation of water resources and maintenance of other ecosystem services. European countries reported that a total of over 25 million hectares, or 11.8%, of forest were designated to fulfil these functions (Table 50). However, only 49% of European countries (47% EU countries) provided specific information on the extent of protective forests and other wooded land for soil, water and other ecosystem functions. The reported share of protective forests – soil and water and other ecosystem functions – ranges from 0 to over 70%. 3 countries reported that 15 to 20% of their forests are considered protective while 6 indicated a share exceeding 20%. Protective forest area is highest in Italy (87%) followed by Romania (above 35%). South-West Europe has the most extensive relative protective forest cover (Table 50) while North Europe appears to have very little relative cover. However, this is because several countries do not distinguish between forest designated for the protection of soil, water and ecosystem functions (Indicator 5.1) and that primarily designated for the protection of infrastructure and managed natural resources (Indicator 5.2). Figure 84 shows that if this undifferentiated area is taken into account, it would appear that Central-West Europe is the region with the smallest area of designated protective forest. Explanatory information provided by the countries shows that the assessment guidelines were not interpreted consistently as the definitions of protective forest applied can vary widely. It appears that some countries are increasingly reluctant to define a proportion of national forest area as specifically designated for environmental protection, possibly because this could imply that the remaining areas fail to provide the associated services. While the guidelines require a legal basis or designated management plans that ensure a long-term commitment to protective functions, these are often implemented in conjunction with other functions (e.g. production, recreation). The explanatory information provided by the countries reveals that protective forests were identified as having clearly distinguishable protective functions based on surveys (e.g. mapping of forest functions/services), given physical characteristics (e.g. slope, being above a certain elevation) or designations of some kind.

Several countries commented that, while forests fulfil protective functions, their primary aim is "multiple use", hence they do not qualify for reporting under Criterion 5. This highlights the fact that while a considerable amount of forest and other wooded land is designated and managed to ensure the protection of water supplies and prevent soil erosion, much of the remaining forest and other wooded land in Europe plays a similar role based on the other ecosystem goods and services that they provide.

Table 50. Forest land reported for the protection of soil, water and other ecosystem services in 2015 by region

Country group	Total forest	Protective forest (Indicator 5.1)	Percentage of forest area
	1,000 hectares		in percent
North Europe	70,832	523	0.7
Central-West Europe	38,582	900	2.3
Central-East Europe	44,494	7,988	18.0
South-West Europe	30,913	13,156	42.6
South-East Europe	30,446	2,837	9.3
Europe	215,267	25,405	11.8
EU 28	161,082	20,946	13.0

Trends

25 countries are included in the presentation of temporal trends for the period 1990-2015. There has been an increment in the area of forest managed for the protection of soil, water and other ecosystem functions. However this is almost certainly an artefact of variations in the country reporting between 2010 and 2015. For example, Germany did not define any protective forest in 2015, referring to "many political discussions that not give a clear picture about the development". Albania and Serbia reported in a similar vein. The trends in protective forest area (Figure 84) reflect these changes in reporting, which have a significant impact on the overall trends for Europe and the EU 28 countries. The apparent trend for an increase in area in South-West Europe is probably an artefact of the estimation method used by one country. Thus, due to the variability in the interpretation of the indicator, the presentation of trends over time in Figure 84 should be treated with caution. The observed changes are due to the limited comparability between reference years, modifications in survey methodologies and intensity, and policy decisions about the definition of protection forests. Finally, changes in the composition of country reporting inevitably affects the comparability of the data from the different reporting periods.

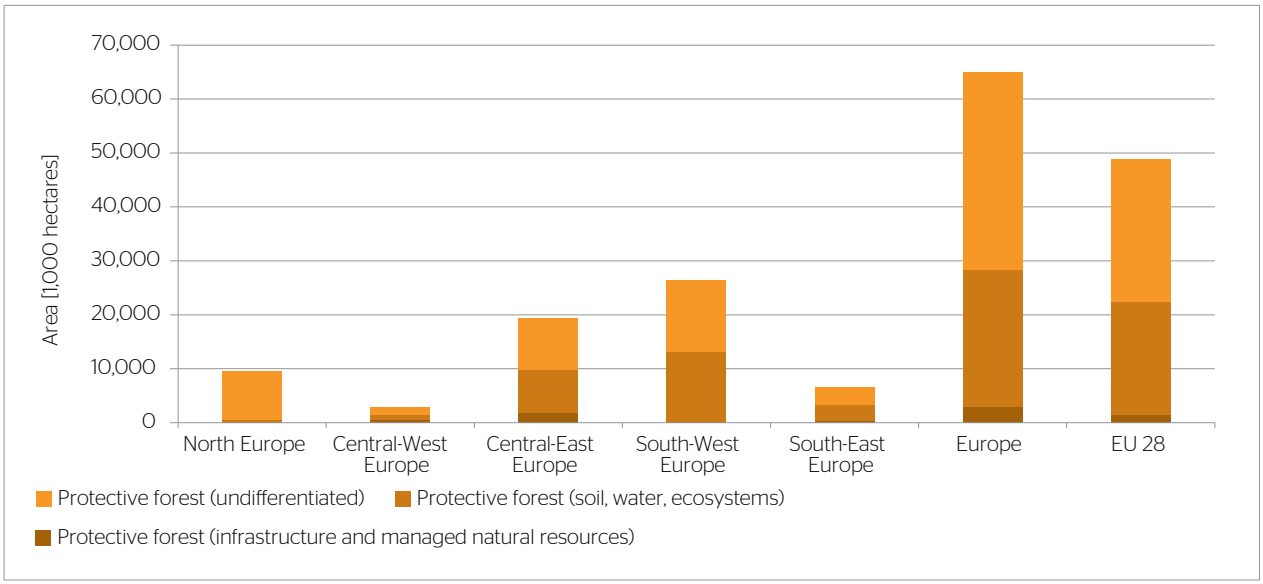

Figure 83. Area of protective forest as assigned by contributing countries to Indicator 5.1 (soil, water and ecosystems), Indicator 5.2 (infrastructure and managed natural resources) or undifferentiated

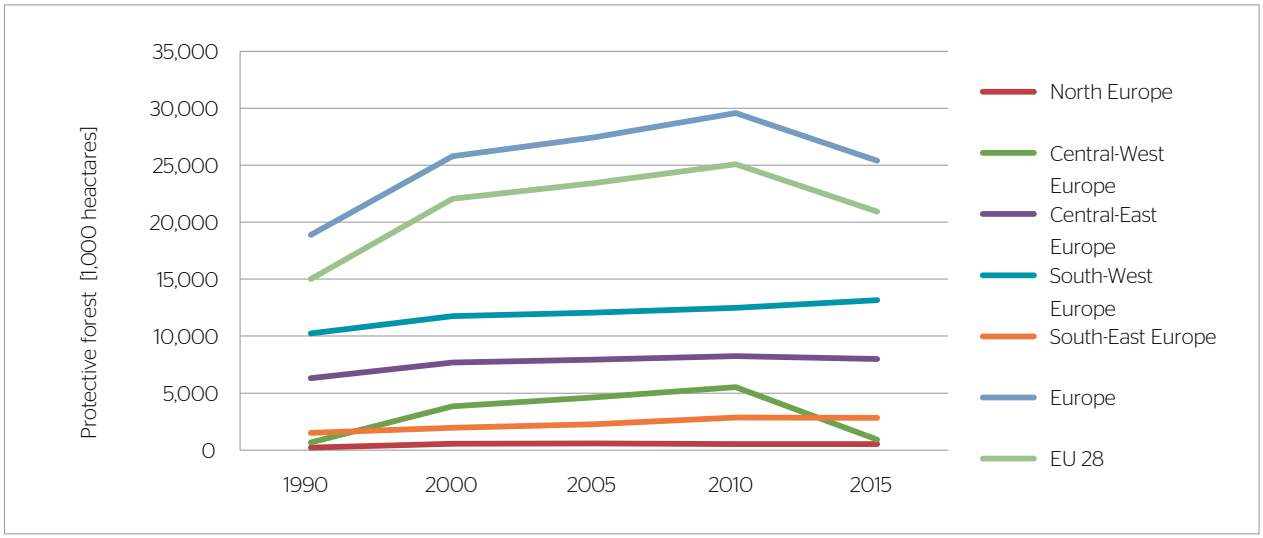

Figure 84. Trends in the area of protective forest from 1990 to 2015 by region

Indicator 5.2 Protective forests – infrastructure and managed natural resources

Area of forest and other wooded land designated for the protection of infrastructure and managed natural resources against natural hazards, part of MCPFE Class "Protective Functions"

Introduction

A wide variety of man-made infrastructure relies on the protection provided by forests. Such protective functions are mostly found in mountainous areas or areas subject to extreme climatic conditions. Countries reported the presence of forests that protect roads and railways, human settlements and other facilities, health resorts, cultivated soils and forest stands of special value, and they can act as shelter belts. Forests offer protection from various impacts, including rock fall, avalanches, wind, noise, emissions and climate. Adapted regimes have been developed for the specific needs of particular types of protective forests.

Status

The data provided for the Indicator 'Protective forest – infrastructure and managed natural resources' in 2015 were rather fragmentary. The countries often found it difficult or impossible to differentiate between the two indicators under Criterion 5. They also noted that functions relating to both indicators are often allocated to the same forest area and thus give rise to overlaps. For this reason not all countries could be included in the analysis and explanations for this are provided below.

Of 45 countries, 23 provided information for 2015. 9 countries allocated forest area to this indicator while 14 reported '0' values. The remaining countries indicated that such data is not available, not separable, or that an overlapping of functions makes it impossible to provide reliable information. Based on the data received from countries, approximately 1.5% of the forest area is allocated to Indicator 5.2. The highest percentages are found in Switzerland (44%), Czech Republic (12%), Austria (10% of forest and other wooded land), Poland (9%) and Ukraine (7%). 4 countries provided data that

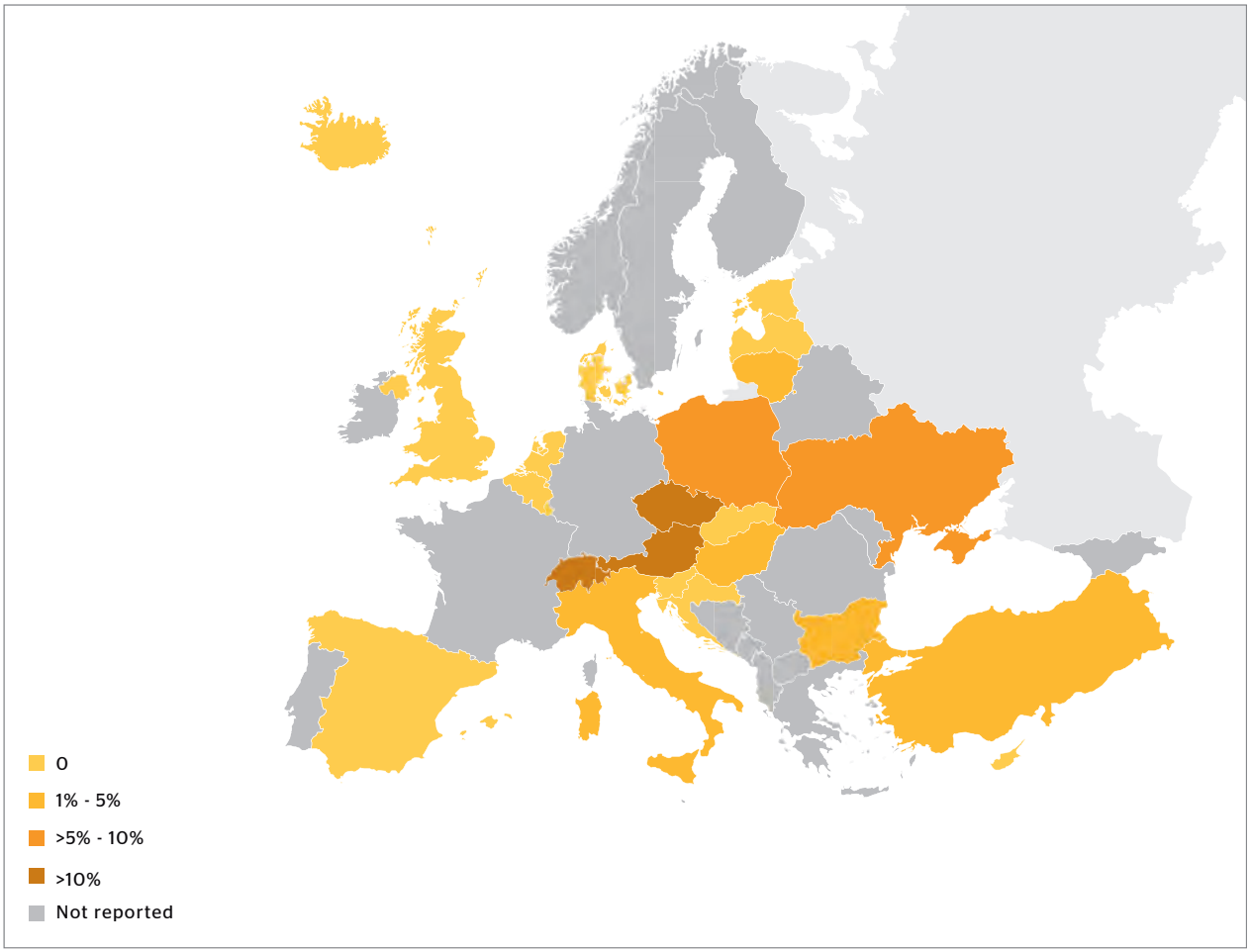

Figure 85. Forest area reported for the protection of infrastructure and managed natural resources in 2015 (percentage of forest area)

Note: Austria provided data for forest and other wooded land combined. Given the lack of data for forest area, this percentage was used for Austria and displayed on the map. Countries reporting combined data for Indicator 5.1 and Indicator 5.2 are not shown in the map.

did not differentiate between Indicator 5.1 and Indicator 5.2. The percentages of forest area accounted for by both indicators are 1% in Finland, 34% in Norway, 14% in Sweden and 7% in Montenegro.

Switzerland noted that its figures are based on a legally binding GIS layer, which is regarded as valid for the coming years. Further comments provided by the reporting countries on the types of forest designation applied under Indicator 5.2 included, e.g., water body and embankment protection, city forests and settlement protection, forest areas surrounding state parks or factories, forest belts along motorways and railroads, forest areas around health resorts, protection against emissions and noise pollution, forests of aesthetic value, and designated military areas. For example, Austria reports so-called 'object-protecting forests' ('Objektschutzwälder') as stated in its Forest Act. These are "forests which protect humans, human settlements or facilities, or cultivated soil in particular against natural hazards or injuring environmental impacts and which require special treatment to gain and ensure their protective or beneficial effect".

Trends

The data available for trend analyses are very limited, thus Table 52 should be approached with caution. Overall, 24 countries provided trend data on forests that protect infrastructure and managed natural resources. Of the 24 countries, 14 specified '0' values for all three reporting years (2005, 2010, 2015). Despite the fact that it only provided trend data for forest and other wooded land combined, Austria is included in the trend analysis. Overall, there were only minor changes in protective forest area in the different European regions and Europe as a whole. An annual increase of around 55,000 ha can be observed for Europe between 2005 and 2015, with the highest reported figure recorded in 2010. A slightly decreasing trend of 5,500 ha per year was reported in the EU 28. It is noted that changes in trends may partly also originate from the provision of information by a varying set of countries, changes in survey methodology and policy developments.

Table 51. Forest reported for the protection of infrastructure and managed natural resources in 2015 by region

Region	Total forest area	Protective forest area	Percentage of total forest area
	1,000 ha		in percent
North Europe	70,832	24	0.03
Central-West Europe*	38,582	933	2.42
Central-East Europe	44,494	1,875	4.21
South-West Europe	30,913	61	0.20
South-East Europe	30,446	404	1.33
Europe	215,267	3,298	1.53
EU 28	160,931	1,802	1.12

*including data for Austria (forest and other wooded land combined)

Table 52. Trends in the area of forest reported for the protection of infrastructure and managed natural resources by region (2005 – 2015)

Region	Total forest area	Protective forest area 2005	Protective forest area 2010	Protective forest area 2015	Annual change (2005-2015)
	1,000 ha				
North Europe	70,832	22	24	24	0.2
Central-West Europe*	38,582	280	918	933	54.8
Central-East Europe	44,494	2,157	2,009	1,875	-28.1
South-West Europe	30,913	61	61	61	0.0
South-East Europe	30,446	232	355	404	17.2
Europe	215,267	2,752	3,366	3,298	54.6
EU 28**	160,931	1,857	1,930	1,802	-5.5

*including data for Austria (forest and other wooded land combined)
**including data from Croatia for 2005 and 2010

Qualitative Indicator

Indicator B7 Protective forests and other wooded land

The protective functions of forests, i.e. the protection of soil, water resources and biodiversity, are constantly high on the political agenda in Europe

Status, trends and main changes in policy objectives since SoEF 2011

The majority of countries state that the main policy objectives are the maintenance and enhancement of the protective functions of forests for preventing soil erosion and improving water quality and quantity

The majority of the reporting signatories (26 of 34) declared specifically formulated policy objectives in relation to protective forests. Most of the reporting signatories (Belgium, Bulgaria, Croatia, Cyprus, Estonia, Finland, Germany, Hungary, Iceland, Italy, Latvia, Norway, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Ukraine, UK) focus on further maintaining and enhancing the protective functions of forests for preventing soil erosion (19 countries) and improving water quality and quantity (16 countries). The third most visible policy objective relates to the protection of biodiversity (10 countries). Several of the reporting signatories also flagged the prevention of natural hazards and floods, climate change, the protection of landscapes and infrastructure, and the enhancement of human health and recreational functions as policy objectives. In addition, the signatories reported other specific objectives in relation to protective forests, for example:

- assessing the protective effects of forests; applying forest land-use planning and area-related planning across sectors (Austria);
- improving quality of life through the protection and enhancement of social and cultural forest functions (Bulgaria);
- acknowledging the importance of forests for the defense of the country and the development of local communities (Croatia);
- converting up to 1,000 hectares of commercial forest to native conservation woodland between 2015 and 2020 in order to protect sensitive water systems (Ireland);
- quantifying the value of protective functions and ecosystem services and providing payments for protective functions (Romania).

25 signatories reported that there had been no significant changes their in main policy objectives since 2011. However, 5 signatories reported changes in their main policy objectives which focused on payments for protective functions (Romania), the inclusion of specific objectives in the national legislation (Iceland), special protection mechanisms under the National Catalogue of Public Utility Forests (Spain), the introduction of melioration through agroforestry (Ukraine) and greater emphasis on tree diseases (United Kingdom).

Almost half of the reporting signatories (15 of 34) mentioned the implementation of key measures on protective forests. The most frequently reported key measures were implemented through national and regional forest programmes, action plans, strategic programmes, guidelines (Austria, Finland, Hungary, Slovak Republic, Spain, Turkey, Ukraine, United Kingdom), and national forest or forest relevant legislation (Bulgaria, Czech Republic, Cyprus, Ireland, Slovenia). The use of research programmes and projects (Finland, Romania) and the mobilization of EU funds through the national rural development programmes were also reported. Ireland identified opportunities for converting and restructuring commercial forests into low intensity native woodland in order to protect sensitive water systems and habitats, Spain maintained the Spanish forest catalogue of protective forests, Slovak Republic initiated investments in flood prevention, Turkey launched a National Afforestation and Combating Erosion Action Plan Campaign, and the European Commission introduced the new EU Forest Strategy for implementing the identified policy objectives.

Only 2 countries provided information on key lessons learned. Slovak Republic highlighted the fact that the lack of financial resources is hampering further progress in relation to the enhancement of protective functions. Spain reported that the 2006 amendment of the basic Forest Law (Ley 43/2003) with Law 10/2006, through which a new kind of protective forests is included in the legislation, has emerged as ineffective and unworkable at national level.

Institutional framework

Around 85 % of signatories report stability in the institutional frameworks

The institutional frameworks relating to the protective functions of forest presented few changes compared to 2011. The responsible institutions are mainly ministries, state forest enterprises, state authorities, forest owners, research institutes, municipalities and regional governments. Only a few signatories (5 of 34, i.e. Bulgaria, Croatia, Finland, Spain, United Kingdom) reported institutional changes. However, these changes were not specifically bound to protective functions and involved institutional structural changes relating to national forestry responsibilities in general.

Legal/regulatory framework and international commitments

Forest and conservation laws are the main legal frameworks and didnot change in the majority of the reporting signatories

In most of the reporting signatories, the forest law regulates protective services, often in combination with the nature conservation legislation. Only 5 of 34 signatories reported changes in this area relating to protective forests since 2011. Bulgaria amended its forest legislation in relation to erosion and floods in 2013 to enhance the protection of forest territories against erosion and floods through the construction of erosion prevention systems. Cyprus also amended the national legislation in order to meet national demands and comply with international commitments. The Irish Forestry Act of 2014 updated the legislative framework governing forestry, which grants the responsible minister a wide range of options for regulating all aspects of forestry, including protective functions. Montenegro introduced a new system for establishing protective forests. Ukraine adopted the concept of melioration through agro-forestry in 2014.

Financial instruments and economic policy

Stability of financial instruments and economic policy as a main trend for 75% of countries

Over three quarters of the reporting countries (28 of 34) reported that there had been no major changes in overall financial instruments and economic policysince 2011. In the other cases, the reported changes do not explicitly affect protective functions. Only Montenegro reported the introduction of a financial scheme for compensating forest owners for related losses of income.

Informational means

No major changes in relation to informational means

The majority of the signatories stated that the informational means reported in 2011 remained unchanged. Only a few (3 of 34) reported on changes in this area. However, most of these changes were not directly linked to protective functions but the raising of awareness about forests in general (Finland). Austria increased the use of social media since the International Year of Forest in order to reach out to younger generations. Slovak Republic introduced an online GIS platform to support forestry practitioners with a free flow of information.

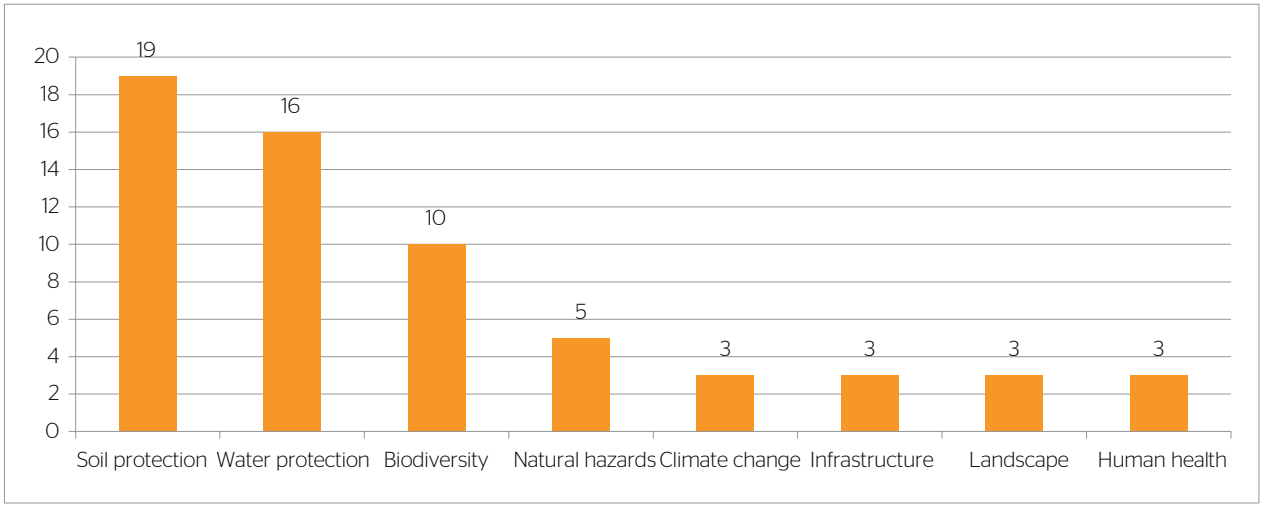

Figure 86. Issues covered by the main policy objectives relating to protective forests and other wooded land for the period of 2011-2014

Criterion 6: Maintenance of other socio-economic functions and conditions

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Qualitative Indicators:	Indicators B.8, B.9, B.10, B.11, B.12 – National reports on Reporting on the pan-European Qualitative Indicators for Sustainable Forest Management

Key findings

Indicator 6.1 Forest holdings

Although significant forest areas in Europe have been privatised, the total public forest area remains of the same order as 20 years ago as the loss of public forests has been compensated by the general expansion of forests in many countries. Private forest area increased by approximately 18% over this period. Public and the private forest area in Europe are both slightly over 100 million ha in size. While the total number of private forest holdings increased substantially between 1990 and 2000, and thereafter at a somewhat slower rate, the number of forest holdings in public ownership in most countries remained relatively constant or decreased. The main driving force behind the changes in forest ownership structure is the drive towards the privatisation and restitution of forest lands in countries with formerly centrally planned economies.

Indicator 6.2 Contribution of forest sector to Gross Domestic Product

The total gross value added in the forest sector in Europe in 2010 amounted to EUR 103 billion. The forest sector contributed 0.8% to GDP in the region as a whole, down from 1.2% in 2000. This occurred because the sector has not been able to keep pace with overall economic growth in Europe. Although 7 out of the top 10 countries with the highest value added in the forest sector are located in Central-West Europe and South-West Europe, relatively speaking, the sector is more important to local economies (i.e. higher percentage of GDP) in North Europe and Central-East Europe. The generally downward trend in the value added of the pulp and paper industry in Europe continued, however the decline was not as steep as it used to be. The forest sector was affected by the recent global economic recession in 2008-2009 and has been on a slow path of recovery since.

Indicator 6.3 Net revenue

The net value added per ha varies considerably between regions. The highest value in 2010 was recorded by Central-West Europe (145 EUR/ha). During the period 2005-2010 all regions except Central-East Europe and Russian Federation recorded an annual increase in net value added, which ranged from 0.1 to 5.3 % per year. During the same period, net entrepreneurial income was negative for North Europe and South-East Europe. However, caution is advised when comparing periods and regions, among other things because the variation in the countries included in the statistics from period to period is significant.

Indicator 6.4 Expenditures for services

Governments in Europe currently spend a minimum of almost EUR 5 billion on forest services, which corresponds to an average of EUR 41 per ha. The variability of expenditure across the individual regions is considerable, and global European expenditure in real terms declined considerably between 2000 and 2010. Government revenue from forest products and services reached a minimum of EUR 2.0 billion in 2010, i.e. an average of EUR 51 per ha. In nominal terms, revenue increased constantly over the decade 2000-2010 in all European regions. However, if inflation is taken into account, real total European revenue decreased consistently from 2000 to 2005, and almost returned to the original 2000 level in 2010.

Indicator 6.5 Forest sector workforce

Employment and income for about three million people are provided by the European forestry (620,000 employees), wood manufacturing (790,000 employees) and the paper (790,000 employees) industries. Forestry and wood manufacturing are micro-

enterprise environments where at least 1 in 5 persons is self-employed or an entrepreneur. Educational standards in forestry are generally good; however qualifications vary enormously between regions. The forestry sector is and remains a "male domain".

Indicator 6.6 Occupational safety and health

Too many accidents occur in forestry with 1 in 10 people suffering from accidents in some countries. Despite considerable efforts in the area of accident prevention over the last two decades, forestry remains one of the most dangerous occupations.

Far too many countries do not have a monitoring system for assessing the safety situation in the forestry sector – this is indicative of a lack of awareness and preventive action.

Indicator 6.7 Wood consumption

Wood consumption varies considerably between the different regions of Europe, mainly based on the endowment with forest resources and cultural differences in the use of wood. Following steady growth in wood consumption between 1990 and 2005 in most regions, due to the financial and economic crises, there was a considerable slowdown in consumption between 2005 and 2010. Structural (downward) trend breaks in the consumption of (mainly graphical) paper added to the effects of the economic downturn.

Indicator 6.8 Trade in wood

The trade in roundwood and all of its products within Europe and with its trading partners was on the rise until the 2008-2009 global financial and economic crisis. Exports doubled in volume between 1990 and 2005 and imports increased by 60%. With many European countries in recession during the period, the volume of trade decreased, however the value of trade remained steady from 2005 when adjusted for currency movements. Europe has developed from a net-importer to a net-exporter of primary wood and paper products. In Europe as a whole and the EU-28 this shift occurred from 2005, chiefly as a result of contracting consumption and imports. Government policies supporting renewable wood energy resulted in a boom in the trade in chips and pellets.

Indicator 6.9 Energy from wood resources

North Europe has the highest per capita consumption of wood-based energy, a fact that reflects the (general) abundance of forest resources and prominence of wood-based industries in the region. Annual per capita wood consumption increased in both North and Central-West Europe between 2009 and 2011, reflecting, in part at least, the drive to meet renewable energy targets. While fuelwood consumption per rural inhabitant decreased in the European countries covered by the Joint Wood Energy Enquiry (JWEE) in 2011, there was a notable increase in the per capita consumption of wood pellets.

Indicator 6.10 Accessibility for recreation

75% of countries report that access to at least 90% of their forest and other wooded land was available to the public for recreational purposes in 2010; the figure exceeds 95% in half of the countries that reported on this indicator. Two thirds of the countries report that less than 6% of their forest and other wooded land area had recreational use as a main management goal. In terms of the number of visits, the estimates provided by the countries vary enormously. However, direct comparisons between the countries are not feasible as the data are based on different sources, estimation methodologies and reference years.

Indicator 6.11 Cultural and spiritual values

Around one and a quarter million sites of cultural and spiritual value have been recorded within forests and other wooded land across Europe, of which around three-quarters were classified as 'Cultural heritage'. Around three-quarters of all sites were recorded in Sweden. The total number of sites has increased by around 15% since 2011, primarily in Sweden but also in South-East Europe. The number of countries able to provide data on at least one category of site was 28, compared to 29 in 2011. This represents an increase from the 22 sites reported in 2007.

Qualitative Indicators

Indicator B 8 Economic viability

The majority of reporting countries have specific policy objective in relation to the economic viability of forestry. Very few countries reported changes in those policies since SoEF 2011.

Almost half of the reporting signatories (15 of 34) reported on the introduction of key measures on productive forests (e.g. NFP, Forest Acts, research programmes, rural development programmes, tax measures and subsides). In most case, the economic viability of forests is linked to policy areas B4 and B5.

Most of the countries reported no changes in relation to legal, economic or financial support measures or in relation to informational and communication means. Few countries reported changes relating to institutional frameworks.

Indicator B 9 Employment

The majority (25 of 34) reporting signatories have specific objectives relating to employment (mostly aimed at, inter alia, the maintenance or increase of forest employment, improvement of working conditions and skills and qualifications). For most countries (30 of 34), these objectives are in continuity with those reported in 2011.

Few signatories (6 of 34) reported changes in the institutional arrangements, most of which were linked to overall institutional reforms, and 6 reporting signatories also reported changes in forest health and safety legislation. The majority of countries reported on continuity of the financial and informational mechanisms in comparison to 2011.

Indicator B 10 Public awareness and participation

A total of 25 of 34 signatories countries reported specifically stated policy objectives in relation to public participation and awareness. Compared to 2011, more countries now aim to promote and improve participation in forest planning and decision-making processes. For nearly one third of the reporting countries, the overall main objective is to enhance public awareness about forest protection and conservation, and increase understanding of the multifunctional role of forests.

Regarding the institutional framework, most signatories (24 of 34) reported no significant changes since 2010 and forest law continues to provide the main legal and operational basis for public awareness and participation. As already stated in 2011, a wide variety of awareness-raising activities (e.g. self-explanatory informational initiatives, sometimes implemented in combination with economic instruments) and informational and educational means (as for instance publications, flyers, brochures, films, websites, annual reports or statistical books, informational and media campaigns, forest events or exhibitions, etc) are deployed.

Indicator B 11 Research, training and education

Most signatories (26 of 34) reported specifically stated objectives in relation to research, training and education, and around 25% reported developments in relation to specific objectives in this area since 2011. Regarding education and training, the situation remains similar to the previous reporting period.

Most signatories (21 of 34) reported no changes in their institutional frameworks in relation to research, training and education. However, administrative and/or organizational changes took place over the period 2011-2014 in 7 countries.

In many countries, research, training and education policies are based on forest laws, general legislation on training and education, or specific forest-related research, training and education policies. Only 4 countries reported having amended their main reference legal documents or having adopted new specific regulations or policies in relation to research, training and education (e.g. a new framework convention for forest research 2014-2019) since 2011. Several countries mentioned the importance of the EU Horizon 2020 framework for research.

Around 80% of the signatories reported continuity in relation to financial and informational instruments since 2011.

Indicator B 12 Cultural and spiritual values

The number of countries that provided data on this indicator increased from 29 to 31 over the last four years, and 60% of them reported positive changes in some regard.

Regarding key measures adopted, almost 30% of the countries that submitted data reported on diverse measures in relation to cultural and spiritual values.

Most countries reported no changes in the overall financial instruments and economic policy contributing to cultural and spirituals values. Regarding informational instruments, few (5 out of 31) countries reported positive developments in relation to cultural and spiritual values (e.g. Nature Parks and information centres for visitors, new publications), more cultural events and forest school programmes.

Indicator 6.1. Forest holdings

Number of forest holdings classified by ownership categories and size classes

Introduction

In the Baltic States and several countries of Central-East and South-East Europe with formerly centrally planned economies, political decisions resulted in a drive towards privatisation and the restitution of forest lands to former forest owners or their descendants. Other possible reasons for changes in ownership structure include the division of holdings due to inheritance and the reorganisation of companies fully or partly owned by the State.

Ownership is assumed to be a key factor that influences forest land management and protection (Siry et al. 2010). The number of forest holdings, the size of landholdings and nature of ownership are assumed to have implications for forest management and various other socio-economic circumstances. However, these relationships vary across countries and depend on several factors that have not yet been fully investigated. Studies have indicated that, in general, the volume of market-based goods, such as timber, provided by private forests exceeds their share of land ownership, while public lands produce more fuelwood and multiple use goods and services. The environmental performance of private forests in terms of forest management plans, forest certification, and compliance with forest regulations appears to be similar to that of public forests.

Status

Particularly high proportions of privately owned forest are found in Austria, France, Denmark, Norway, Sweden, Slovenia, Portugal and Spain. At only around 3% of the total forest area, Portugal is the country with the smallest proportion of public forest. Public ownership is dominant in Central-East and South-East Europe where the average share lies between 80 and 90%. This high average percentage is influenced by countries in these regions, in which all or nearly all forests are in public ownership, i.e. Belarus, Georgia, Moldova, Ukraine, Malta, Albania and Turkey. The average share of forests in public ownership is slightly over 30% in Central-West Europe and slightly under 30% in North Europe and South-West Europe. The variations in ownership between countries are shown in Figure 87. In the case of missing data, it is assumed that values remain the same as in the nearest reference year, or data from the previous FOREST EUROPE report are used (2011).

For many countries, the number of forest holdings is unavailable completely or in part, which makes it difficult to describe the exact status of the various regions. Generally, the number of private forest holdings is much higher than that of public holdings, especially in the smaller size classes. The number of private forest holdings is especially high in some countries, e.g. France, Poland and Croatia. By far the majority of these holdings are in the size class of less than 10 ha. The lack of a harmonised minimum holding size in the national statistics also makes it difficult to compare countries directly.

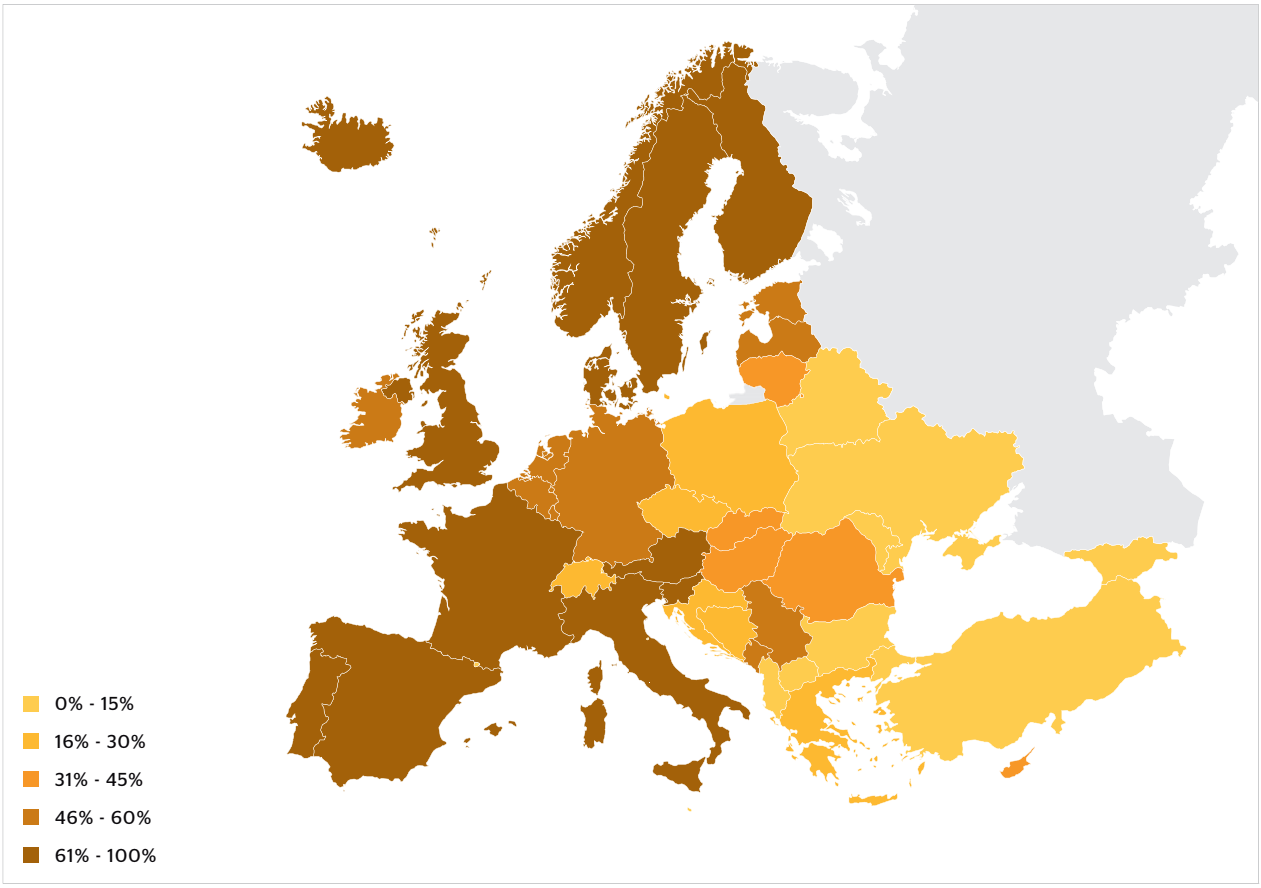


Figure 87. Area of privately owned forest as a percentage of total forest (2010)

Trends

The status in forest ownership for 2010 and the developments in private forest area are shown in Figure 88 and Figure 89.

Public forest area clearly decreased in North Europe between 1990 and 2010. This reduction is due to the restitution and privatisation process under way in the Baltic countries. Changes in the Scandinavian countries during the same period were minimal. In Central-East Europe, there was a moderate decrease in publicly-owned forest area over the period between the reference years; this was accompanied by a strong relative increase in private forest, which, however, was quite moderate in absolute terms. No distinct trend can be ascertained for public forest in Central-West Europe, however there was a slight decrease in private forest area. In South-East Europe, no strong trend can be identified, despite the clear decrease in public forest area in Slovenia. The private forest area also increased in this region. An increase of over 20 % was observed in public forest in South-West Europe between 1990 and 2010. This trend appears to be due to a general increase in the forest area of Italy and Spain; a similar development was also observed for private forest.

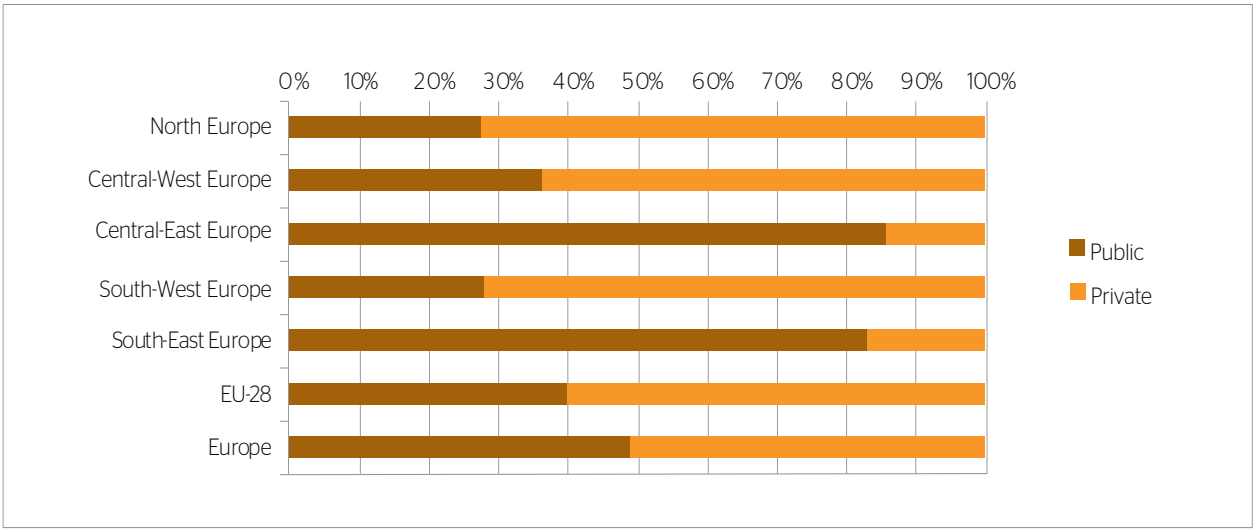


Figure 88. Distribution of forest area in 2010 by ownership classes and region

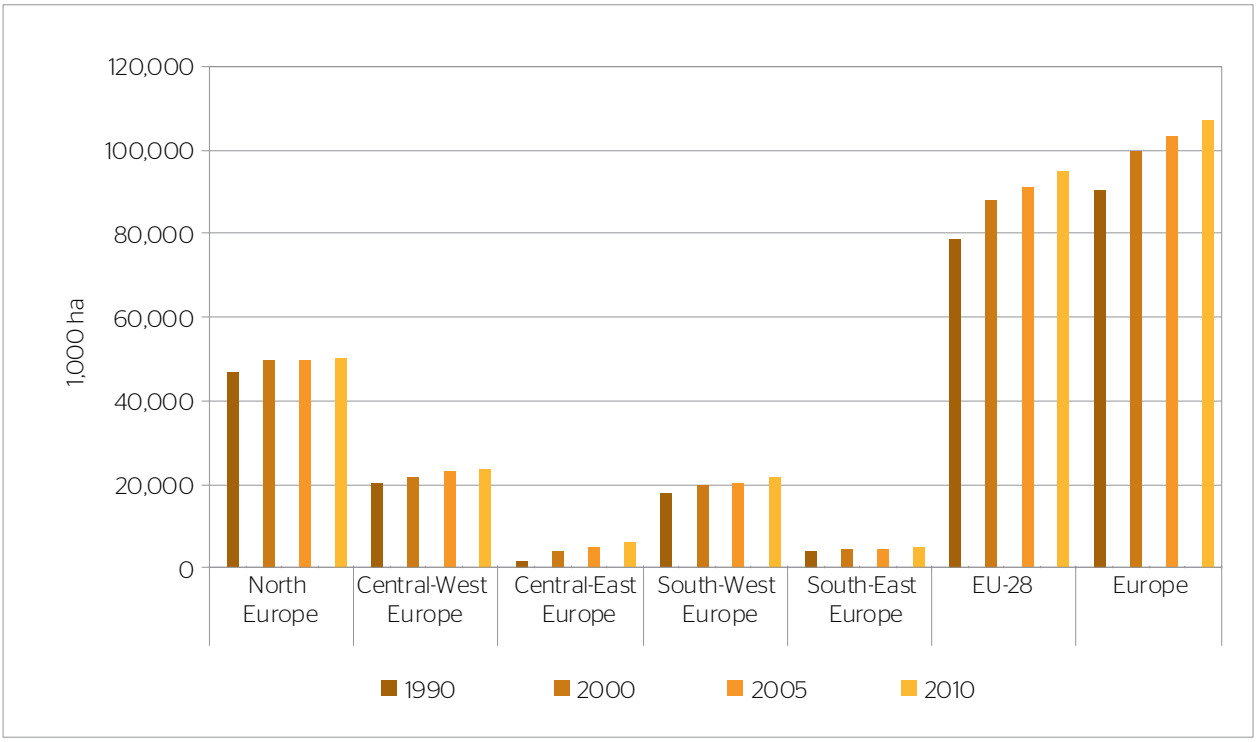


Figure 89. Private forest area 1990 - 2010 by region

The increase in private forest in North Europe appears to be of the same order as the reduction in public forest. The private forest area in Central-East and North Europe increased by more than 8 million ha, largely as a result of restitution and privatisation measures. In the FOREST EUROPE region, privatisation led to a substantial increase in the area of private forest in Estonia, Latvia, Lithuania, Czech Republic, Hungary, Romania, Slovak Republic and Bulgaria. In general, the countries of the former Yugoslavia already had a significant proportion of private forest in 1990, hence subsequent changes in the ownership structure have been moderate. It might be expected that a decrease in the area of public forest would be balanced by a corresponding increase in the area of private forest (or vice versa), but that does not always appear to be the case as the overall trend in forest area may complicate the picture to some extent. Central-West Europe experienced an increase in the area of private forest despite the fact that the area of forest in public ownership remained relatively constant. A noticeable increase in the area of private forest was reported both for South-East and South-West Europe.

Overall, at slightly above 100 million ha, the area of public forest in the Forest Europe countries (excluding the Russian Federation) remained fairly stable between 1990 and 2010. On the other hand, the area of privately owned forest increased by 18% to approximately 107 million ha. The EU-28 region consists of a mixture of countries with formerly centrally planned economies and countries with a long history as market economies. A moderate decrease in the area of public forest together with a somewhat stronger increase in private forest can be observed there.

The number of forest holdings in public ownership has been relatively constant for the reporting countries in Central-East Europe. A noticeable increase in the number of private forest holdings was reported by Hungary and Slovak Republic. With some exceptions (e.g. Ireland), the number of both public and private forest holdings in Central-West Europe generally remained constant or decreased slightly. In North Europe, the number of private forest holdings increased substantially in the Baltic states and Iceland, but remained fairly stable for the Scandinavian countries. Due to limited data, it is difficult to draw general conclusions for South-East and South-West Europe.

As the reporting on the number of holdings was rather incomplete, it was not possible to draw any definite conclusions. For public holdings, the general trend appears to involve a slight decline. For countries where privatisation and restitution have taken place, the number of private forest holdings increased considerably between 1990 and 2010. Although the number of private forest holdings in the smallest size category (< 10ha) is very high for some countries, their share of the total forest area in all geographical regions is generally relatively limited. The exceptions to this are Lithuania and the South-East European countries which have a few larger private forest holdings.

Forest ownership structure is known to have implications for forest management and the production of timber and other forest products and services. However, these relationships are not very well known. Splitting up forest holdings into smaller ones may pose a potential problem for sustainable forest management, particularly when it comes to maintaining a certain level of production and employment. The change in ownership structure that took place in FOREST EUROPE countries between 1990 and 2010 is mainly affected by the restitution and privatisation process that took place in countries with formerly centrally planned economies. The average size of private forest holdings tended to decrease during this process (e.g. Latvia, Hungary, Slovak Republic and Slovenia) and also in other countries with an increasing forest area due to afforestation measures (e.g. Iceland, Ireland).

Indicator 6.2 Contribution of forest sector to Gross Domestic Product

Contribution of forestry and the manufacturing of wood and paper products to gross domestic product (GDP)

Introduction

The economic contribution of forestry and the manufacturing of wood and paper products to gross domestic product (GDP) is indicative of the forest sector's macroeconomic importance. Gross value added (a component of GDP) is the total value of products produced (output) minus the value of the goods and services consumed as inputs during production (intermediate consumption). Based on the same methodology as that used in the previous edition of SoEF, the data provided for this indicator only reflect the direct contribution of activities in the major formal forest sector to GDP,[1] i.e. the addition of value in forestry,[2] the wood industry,[3] and the pulp and paper industry.[4] However, the sector's full range of economic contributions to GDP may also include the impacts from some other forest-based industries (e.g. forest-based tourism, wood energy, furniture manufacture) and the ripple effects the sector has throughout the rest of the economy (e.g. manufacturing of wood processing equipment, induced impacts of the sector). Therefore, the total economic contribution of the forest sector is far greater than the estimates presented here.

Information about gross value added by the forest sector was collected from countries for three years (2000, 2005 and 2010) and disaggregated into the value added by three subsectors: forestry, wood industry, and pulp and paper industry. These figures were converted into a common currency unit (EUR) for aggregation at the European and regional levels.[5]

Apart from a few exceptions (e.g. Albania, Georgia, Liechtenstein, Moldova, Serbia, Turkey, and Monaco), the majority of countries provided value added data. Moreover, the data for some countries may not be available for all subsectors in any given year. However, the countries that provided data for all years account for more than 97% of the total forest area in Europe. In order to achieve comparability across the regions and over time, the dataset was supplemented with the latest national accounts statistics obtained from Eurostat and national statistics offices.

Status

The total gross value added in the forest sector in Europe in 2010 amounted to EUR 103 billion and contributed 0.8% to GDP in the region as a whole. Among the three subsectors, the pulp and paper industry made the largest contribution to GDP, accounting for 42% of the total value added in the forest sector. With a 38% share of this total, the wood industry was the second largest contributor while forestry and logging activities made up the remaining 20% of gross value added in the forest sector.

The economic importance of the forest sector and the distribution of value added among the three subsectors vary greatly between countries and regions. Table 53 and Figure 90 present the gross value added of the forest sector and its contribution to GDP by region in 2010.

Table 53. Status of the forest sector's value added distribution and its contribution to GDP by region in 2010

Region	Gross value added in the forest sector in 2010							Contribution to GDP (%)
	Forestry (ISIC/NACE 02)		Wood industry (ISIC/NACE 20)		Pulp and paper industry (ISIC/NACE 21)		Forest sector (ISIC/NACE 02, 20, 21)	
	billion EUR	%	billion EUR	%	billion EUR	%	billion EUR	
North Europe	8.2	39	5.8	27	7.3	34	21.3	2.1
Central-West Europe	6.2	13	19.1	39	23.3	48	48.6	0.7
Central-East Europe	3.1	28	4.9	44	3.1	28	11.1	1.3
South-West Europe	2.3	11	8.4	43	9.1	46	19.8	0.8
South-East Europe	0.6	27	1.0	42	0.7	31	2.3	0.7
Europe	20.4	20	39.2	38	43.5	42	103.2	0.8
EU 28	19.3	20	35.8	37	42.0	43	97.0	0.9

[1] Data were collected and presented in accordance with ISIC Rev. 3.1(2004) and NACE Rev 1.1 (2002).
[2] ISIC/NACE Division 01: Forestry, logging and related service activities.
[3] ISIC/NACE Division 20: Manufacture of wood and wood products.
[4] ISIC/NACE Division 21: Manufacture of pulp, paper and paper products.
[5] Unless otherwise stated in the text, the figures presented here are in nominal terms.

A considerable majority of value added in the forest sector (around 80%) is produced in three regions: North Europe, Central-West Europe and South-West Europe. This is largely due to the high levels of value added achieved in the processing subsectors in these regions. Central-West Europe and South-West Europe combined made up more than two-thirds of the gross value added in the forest sector, and around 90% of this originated from the processing subsectors (wood industry and pulp and paper industry).

At country level, the value added (nominal) of the forest sector was highest in Germany (EUR 18.5 billion), followed by Italy (EUR 10.8 billion), France (EUR 9.5 billion), Sweden (EUR 9.4 billion), United Kingdom (EUR 7.3 billion), Finland (EUR 6.9 billion), Spain (EUR 6.6 billion), Austria (EUR 4.8 billion) and Poland (EUR 4.6 billion).

Relatively speaking, forestry and logging activities are more important to the forest sector in North Europe where they accounted for around 40% of the total value added in the sector. In Central-East Europe and South-East Europe, the share accounted for by forestry is also higher than the average for Europe as a whole. The subsector's share in the forest sector is slightly over 10% in Central-West Europe and South-West Europe.

The wood industry generated 40% or more of the forest sector's value added in most regions except North Europe. In Central-West Europe and South-West Europe, the value added by the forest sector is highly concentrated in the pulp and paper industry.

In relative terms, the forest sector is more important to the local economies in North Europe and Central-East Europe where it contributed 2.1% and 1.3% to the regional GDP respectively in 2010. The forest sector is particularly important for the economies of Latvia, Finland, Estonia and Sweden where it accounts for between 3 to 6% of national GDP. The sector is also important to Lithuania, Austria, Romania, Czech Republic, Portugal, Belarus and Poland where it accounts for 1.5 to 2% of national GDP. The forest sector contributed less than 1% to the national GDP of all other countries in Europe.

Trends

Figure 91 shows the trends in the forest sector's value added by industry and contribution to GDP in Europe. For comparability and consistency over time, the countries that provided only partial data are excluded. The countries presented in the graph accounted for around 90% of Europe's GDP and value added in the forest sector. Therefore, the trends presented in the graph provide a good picture of the overall trends in Europe as a whole. Tables 54, 55 and 56 present the forest sector's gross value added by subsector and region for 2000, 2005, and 2010.

In nominal terms, the annual gross value added of the forest sector in Europe remained quite stable at around EUR 103-104 billion from 2000 to 2010. However, the sector's real gross value added declined about 20% during the period at an annual rate of 2.3%.

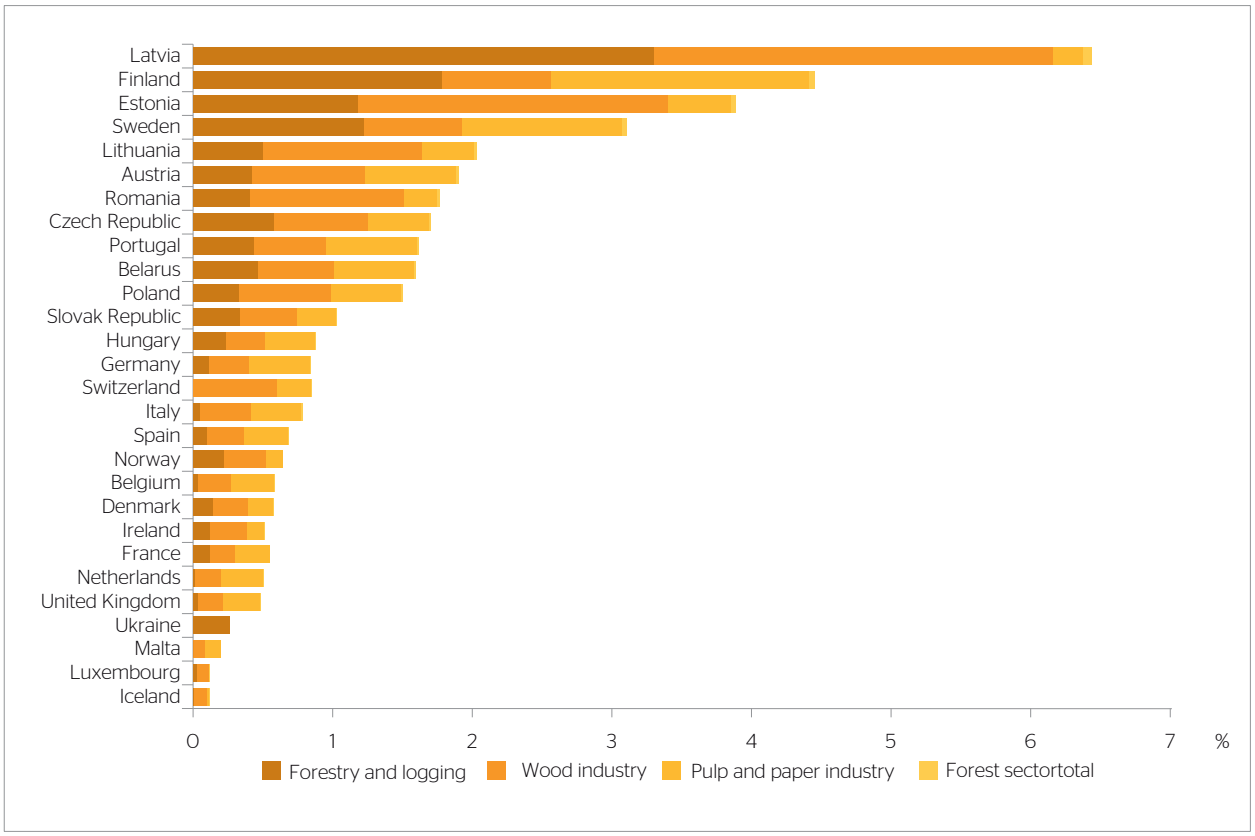


Figure 90. Contribution of the forest sector to GDP in selected countries (percentage of GDP) in 2010

The contribution of the forest sector to GDP in Europe declined from 1.2% in 2000 to 0.8% in 2010. This was mainly due to the expansion of the economy in the region (10% in real GDP) and the simultaneous decline in the value added of the forest sector. In other words, the forest sector was unable to keep pace with other rapidly growing sectors over the past decade and was not the driving force of economic growth in the regional economies. This is consistent with the general global trend observed in the recent decades (FAO, 2014).

The trends in value added (real) varied across subsectors. Due to the strong growth of the industry in some countries of North Europe and Central East Europe (e.g. Latvia, Sweden, Romania and Belarus), the forestry industry grew steadily at 0.1% annually over period 2000-2010. The wood industry was quite stable from 2000 to 2005 until it was disrupted by the recent global economic downturn in 2008-2009. It declined at a rate of 3.1% annually from 2005 to 2010. The value added (real) of the pulp and paper industry in Europe decreased by 3.4% annually during the 2000-2010 period, mostly due to competition from digital media in advertising and publishing and the rapid growth of production capacities in other regions of the world. The pulp and paper industry's share of the forest sector's total value added in Europe declined from slightly less than half (48%) in 2000 to 42% in 2010 while the forestry industry's share increased from 16% to 20% over the same period.

As observed in the previous reports, the pulp and paper industry in Europe continued to be confronted with many challenges. Although the impacts of the decrease in the demand for graphic paper were partly offset by the development in the paper and paperboard packaging industries, the industry as a whole still suffered a significant loss in value added in the region. During the period 2000-2010, the combined annual value added of the pulp and paper industry in the top 5 largest producing countries in the region (Germany, France, Finland, United Kingdom, Sweden) fell by a dramatic EUR 15.3 billion, or approximately 40%. On the other hand, there was a modest increase in the value added of the pulp and paper industry in Bulgaria, Czech Republic and Lithuania. The industry has been undergoing significant restructuring to remain competitive (e.g. enhanced technological innovation, the development of higher value-added products, improvement of access to raw materials, and mergers and acquisitions).

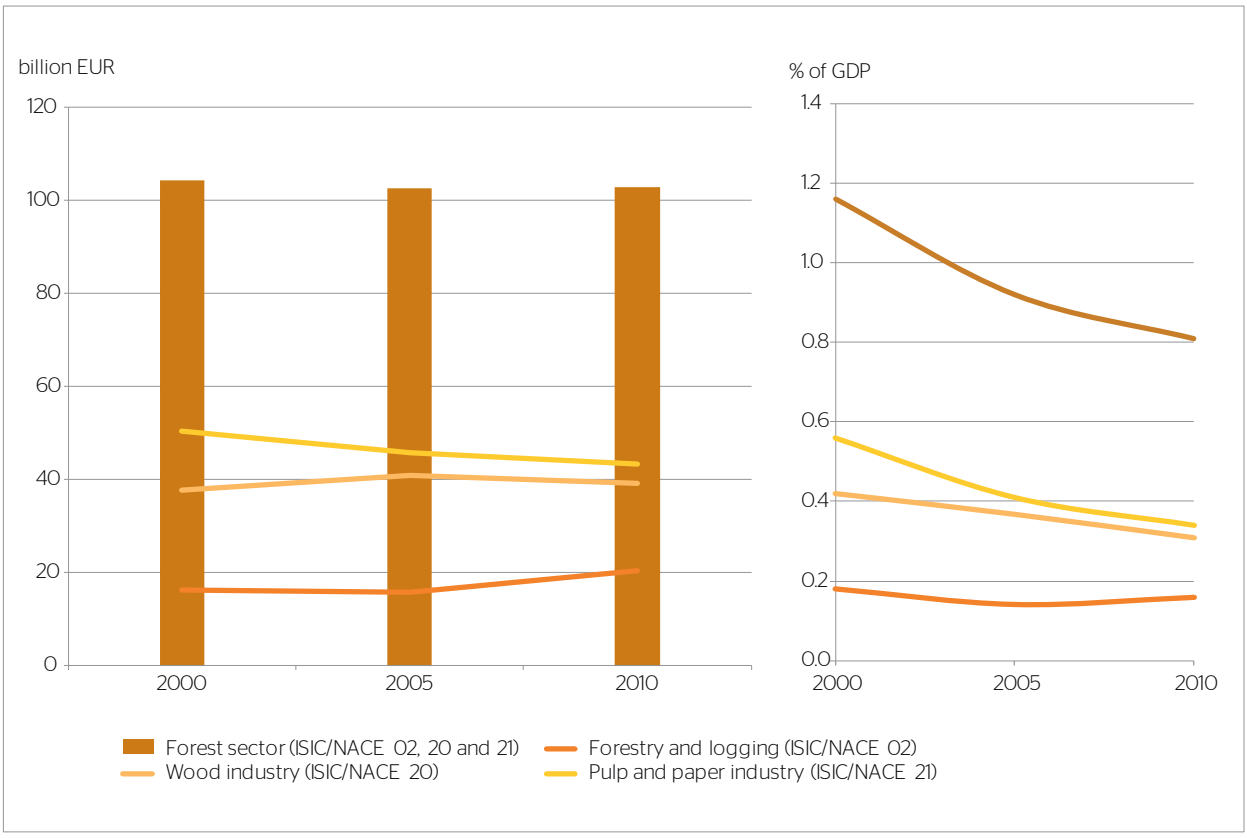


Figure 91. Trends in the forest sector's value added by industry and contribution to GDP in Europe

The regional distribution of the forest sector's value added in Europe also changed slightly during 2000-2010 (Figure 92). Central-West Europe's share decreased from 51 to 47%. Most of the decline arose in the wood and pulp and paper industries due to weakened demand and increased competition from other regions of the world. In Central-West Europe, real value added decreased by 25% in the wood industry and by 31% in the pulp and paper industry over the period 2000-2010. Meanwhile, Central-East Europe's share increased from 6 to 11% mainly due to the gains in the value added in the wood and pulp and paper industries, particularly in Romania and Poland. Although the share accounted for by North Europe only declined slightly for the forest sector as a whole, there were some structural shifts among subsectors in the region. The real value added of the pulp and paper industry in North Europe dropped nearly 8 billion EUR, or 52%, between 2000 and 2010, largely due to the decline in the industry in Finland and Sweden. However, the real value added of the forestry industry increased modestly in North Europe over the same period (e.g. Latvia, Sweden). The shares of other regions in the total value added of the forest sector in Europe remained roughly the same during the period 2000-2010.

At country level, most of the countries in Europe experienced some decline in value added in one or more forest subsectors between 2000 and 2010. For example, the value added (real) of the forest sector experienced the highest decline in Germany (EUR 6.0 billion), followed by United Kingdom (EUR 5.4 billion), Finland (EUR 4.5 billion), France (EUR 4.2 billion), Sweden and Italy (EUR 2.7 billion each). Poland, Czech Republic Romania, and Latvia are among the few countries that increased their value added in all three subsectors of the forest sector over the same period.

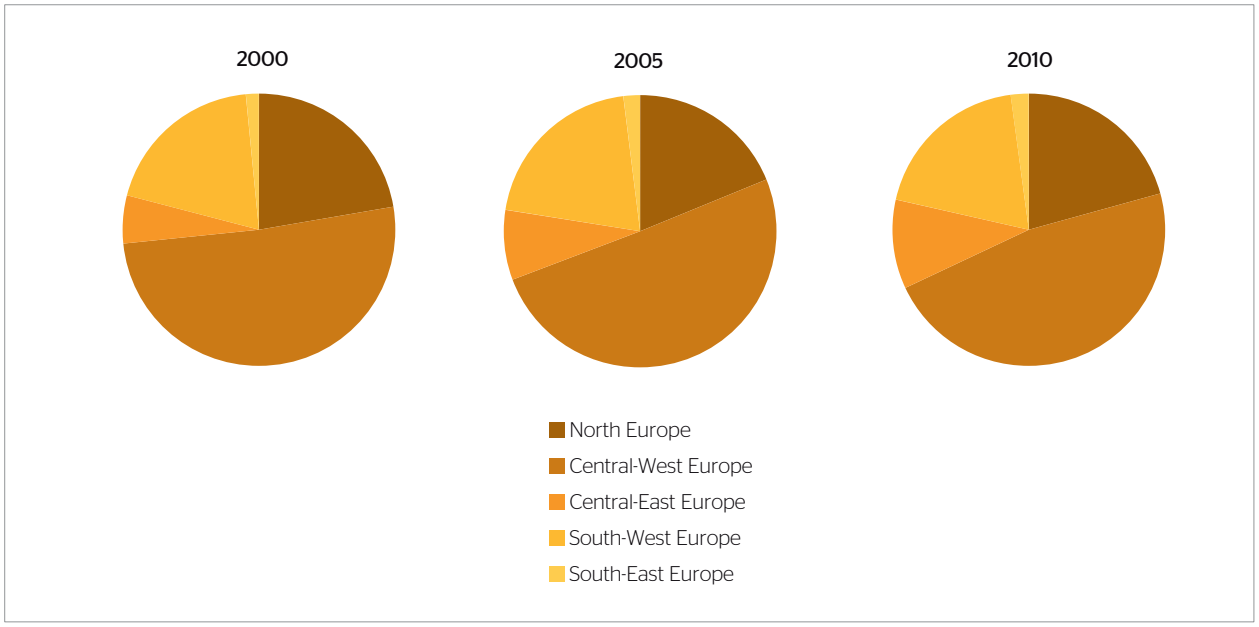


Figure 92. Trends in the regional distribution of forest sector value added 2000-2010

Table 54. Forestry (ISIC/NACE 02) value added and contribution to GDP

Region	Gross value added (billion EUR)			Contribution to GDP (%)		
	2000	2005	2010	2000	2005	2010
North Europe	6.1	4.8	8.2	0.9	0.6	0.8
Central-West Europe	5.5	5.5	6.2	0.1	0.1	0.1
Central-East Europe	1.8	2.4	3.1	0.5	0.4	0.4
South-West Europe	2.6	2.8	2.3	0.1	0.1	0.1
South-East Europe	0.3	0.4	0.5	0.2	0.1	0.2
Europe	16.3	15.9	20.3	0.2	0.1	0.2
EU 28	15.4	14.9	19.3	0.2	0.1	0.2

Table 55. Wood industry (ISIC/NACE 20) value added and contribution to GDP

Region	Gross value added (billion EUR)			Contribution to GDP (%)		
	2000	2005	2010	2000	2005	2010
North Europe	5.1	6.4	5.8	0.7	0.8	0.6
Central-West Europe	20.6	20.3	19.1	0.4	0.3	0.3
Central-East Europe	2.4	3.8	4.9	0.7	0.7	0.6
South-West Europe	9.0	9.5	8.4	0.5	0.4	0.3
South-East Europe	0.6	1.0	1.0	0.4	0.4	0.3
Europe	37.7	41.0	39.2	0.4	0.4	0.3
EU 28	35.3	37.9	35.8	0.4	0.4	0.3

Table 56. Pulp and paper industry (ISIC/NACE 21) value added and contribution to GDP

Region	Gross value added (billion EUR)			Contribution to GDP (%)		
	2000	2005	2010	2000	2005	2010
North Europe	12.1	8.2	7.3	1.7	1.0	0.7
Central-West Europe	27.2	25.9	23.3	0.5	0.4	0.3
Central-East Europe	1.7	2.3	2.9	0.5	0.4	0.3
South-West Europe	8.7	8.8	9.1	0.5	0.4	0.4
South-East Europe	0.6	0.7	0.7	0.4	0.2	0.2
Europe	50.3	45.8	43.3	0.6	0.4	0.3
EU 28	48.6	44.3	42.0	0.6	0.4	0.4

Indicator 6.3 Net revenue

Net revenue of forest enterprises

Introduction

The net revenue of forestry is an important indicator of the degree of economic sustainability of forest management. The net revenue of forest enterprises includes all of the forest owner's sources directly related to forestry, including subsidies and excluding taxes. From the national perspective, increasing net revenue from forestry contributes to economic growth and to rise in the economic sustainability of forests.

Based on statistics from Eurostat's Economic accounts for forestry (ISIC/NACE) and the reports from individual countries, two variables for net revenue are used here: net value added and net entrepreneurial income. They are reported at constant 2005 prices, which have been adjusted for inflation using the GDP deflator.

Status and trends

The net value added at factor cost (factor income) of forestry measures the remuneration generated by forestry activities at market prices (including subsidies and excluding taxes) and equals the sum of labour costs and profit. Table 57 shows that the net value added per ha varies considerably between regions with Central West-Europe recording the highest figure (145 EUR/ha) in 2010, followed by (in declining order) North Europe, Central-East Europe, South-West Europe and South-East Europe. Caution is advised when interpreting the figures in Table 56 because the share of Forests Available for Wood Supply (FAWs) with data on net revenue varies considerably between regions (from 33% for South-West Europe to 98 % for Central-West Europe in 2010) and the quality of the national statistics varies. The trend is even more difficult to interpret because the number of countries included in the statistics for each region varies over time. However, it would appear that in the period 2005-2010 all regions except Central-East Europe recorded an average annual increase in net value added ranging from 0.1 to 5.3%.

Net entrepreneurial income is the net operating surplus in forestry before tax and including subsidies and equals net value added minus labour costs. The statistics for net entrepreneurial income in Table 57 indicate that, in 2010, this income per ha was highest in South-West and Central- West Europe (191 and 72 EUR/ha respectively), followed by North Europe and South-East Europe. The high value for South-West Europe was due to Portugal, the only country in this region to report on this variable in 2010. The uncertainty factors referred to for Table 57 above are equally applicable to Table 58.

Table 57. Trends in net value added at factor costs in forestry 1990-2010. Data source: ISIC/NACE

Region	Information availability of FAWS			Net value added*)				Annual change rate**)					
	No of countries reporting	Regional forest area of reporting countries for 2010 (1,000 ha)	Area of reporting countries in % of total regional forest area in 2010	EUR/ha forest area				1990 - 2000		2000 - 2005		2005 - 2010	
				1990	2000	2005	2010	EUR/ha	%	EUR/ha	%	EUR/ha	%
Central East-Europe	2-4[1)]	10,966	35	-	55	118	97	-	-	12.6	14.6	-4.2	-3.9
Central West-Europe	5-7[2)]	34,385	98	209	142	144	145	-7.7	-4.4	0.4	0.3	0.2	0.1
North Europe	3-7[3)]	53,555	97	121	95	85	109	-2.6	-2.4	-2	-2.2	5	5.3
South-East Europe	1-5[4)]	9,871	55	125	33	30	36	9.2	11.6	-0.6	-1.9	1.2	3.6
South-West Europe	2-3[5)]	10,126	33	116	98	82	88	-1.7	-3.4	-3.2	-3.6	1.2	1.4
EU 28	11-19[6)]	93,630	59	137	105	103	114	-3.2	-2.8	-0.4	-0.4	2.8	2.5
Europe	12-24[7)]	118,902	79	141	106	102	110	-3.5	-2.8	-0.8	-0.8	1.6	1.5

*) At constant 2005 prices.
**) Annual change in % of middle value
1) For 2000: Hungary and Slovak Republic. For 2005: Hungary, Slovak Republic and Czech Republic. For 2010: Czech Republic, Hungary, Slovak Republic and Romania.
2) For 1990: Austria, France, Netherlands, Switzerland and United Kingdom. For 2000: Austria, France, Netherlands, Switzerland, United Kingdom, Belgium and Germany. For 2005: Austria, France, Netherlands, Switzerland, United Kingdom and Germany. For 2010: Austria, France, Netherlands, Switzerland, United Kingdom, and Germany.
3) For 1990: Denmark, Finland and Sweden. For 2000: Denmark, Finland, Estonia, Iceland and Sweden. For 2005: Denmark, Finland, Estonia, Iceland and Lithuania. For 2010: Denmark, Finland, Estonia, Iceland, Latvia, Norway and Sweden.
4) For 1990: Greece. For 2000: Albania, Greece and Slovenia. For 2005: Albania, Bulgaria, Greece and Slovenia. For 2010: Albania, Bosnia Herzegovina, Bulgaria, Greece and Slovenia
5) For 1990, 2000 and 2005: Italy, Portugal and Spain. For 2010: Italy and Portugal
6) For 2010: 19 countries- no data for 9: Belgium, Croatia, Cyprus, Ireland, Lithuania, Luxembourg, Malta, Poland and Spain.
7) For 2010: 24 countries.

Table 58. Trends in net entrepreneurial income from forestry 1990-2010. Data source: ISCC/NACE

Region	Information availability of FAWS			Net entrepreneurial income*)				Annual change rate**)					
	No of countries reporting	Regional forest area of reporting countries for 2010 (1,000 ha)	Area of reporting countries in % of total regional forest area in 2010	EUR/ha forest area				1990 - 2000		2000 - 2005		2005 - 2010	
				1990	2000	2005	2010	EUR/ha	%	EUR/ha	%	EUR/ha	%
Central East-Europe	3-5[1)]	19,094	61	-	11	28	31	-	-	3.4	17.2	0.6	2,0
Central West-Europe	5-7[2)]	34,384	98	128	52	51	72	-7.6	-8.4	-0.2	-0.2	4.2	6.8
North Europe	3-4[3)]	30,351	54	78	71	67	64	-0.6	-0.8	-0.8	-1.2	-0.6	-0.9
South-East Europe	3[4)]	8,084	45	-	-	13	11	-	-	-	-	-0.4	-3.3
South-West Europe	1-2[5)]	2,147	21	99	88	67	191	-1.1	-1.2	-4.2	-5.4	24.8	19.2
EU 28	9-16[6)]	93,630	59	95	62	53	68	-3.3	-4.2	-2.2	-3.6	2.6	4.3
Europe	10-19[7)]	94,061	63	95	61	51	59	-3.4	-4.4	-2.0	-3.6	1.6	2.9

*) At constant 2005 prices.
**) Annual change in % of middle value.
1) For 2000: Hungary, Poland and Slovak Republic. For 2005: Czech Republic, Hungary, Poland and Slovak Republic. For 2010: Czech Republic, Hungary, Poland, Romania and Slovak Republic.
2) For 1990: Austria, France, Netherlands, Switzerland and United Kingdom. For 2000: Austria, Belgium, France, Netherlands, Switzerland, United Kingdom and Germany. For 2005 and 2010: Austria, France, Netherlands, Switzerland, United Kingdom and Germany.
3) For 1990: Denmark, Finland and Sweden. For 2000: Denmark, Estonia, Finland and Sweden. For 2005: Denmark, Estonia, Finland, and Lithuania. For 2010: Denmark, Estonia, Finland and Norway.
4) For 2005: Bulgaria, Greece and Slovenia. For 2010: Bosnia & Herzegovina, Bulgaria and Greece.
5) For 1990, 2000 and 2005: Portugal and Spain. For 2010: Only Portugal.
6) For 2010: 16 countries- no data for 12: Belgium, Croatia, Cyprus, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Slovenia, Spain and Sweden.
7) For 2010: 19 countries.

Indicator 6.4 Expenditures for services

Total expenditures for long-term sustainable services from forest

Introduction

Indicator 6.4 includes all government expenditures on forest-related activities. Hence, it measures all expenditures made by governments for maintaining and increasing the capacity of forests to produce goods and services. Indeed, in the absence of adequate government funding, the benefits that forests can provide can easily decline. The indicator also includes all government revenue collected from the domestic production and trading of forest products and services. This revenue provides the economic incentive for governments to spend on forest-related activities.

Only 2 of 45 countries submitted all of the requested data and 16 provided no information at all. With regard to total expenditures and total revenue, only 12 countries were able to provide full data sets for all three years. Hence, in view of the considerable gaps in the data, any analysis will have a high level of uncertainty. In particular, it was not possible to compare gross revenue and gross expenditure from public forests as only 3 countries provided figures for both categories.

Status

The current (2010) status of expenditure on forest services in Europe is summarised in Table 59. In total, the countries reported total expenditure of almost EUR 5 billion, of which the vast majority was accounted for by the EU-28 countries. Gross expenditure on public forests is the most important component of this expenditure; transfers to the private sector and administrative costs are much lower. However, the last two items are likely to be underestimated as administrative costs are difficult to disentangle from gross expenditures on public forests, and many countries only reported direct subsidies as transfers to the private sector. Given that only 5 countries provided the complete breakdown of total expenditures for 2010, the aforementioned totals clearly cannot tally and the lack of data creates problems when trying to interpret the figures.

The current (2010) status of all government revenue collected from the domestic production and trading of forest products and services is summarised in Table 60. The countries reported total revenue of approximately EUR 2 billion.

Table 59. Government expenditure on forest services in 2010 by type of expenditure and region

Region	Total expenditure on forest services (million EUR)				Total expenditure on fore services per ha (EUR/ha)			
	Breakdown of expenditure on forest services			TOTAL	Breakdown of expenditure on forest services			TOTAL
	Gross expenditure on public forests	Transfers to the private sector	Administration		Gross expenditure on public forests	Transfers to the private sector	Administration	
Central East-Europe	-	5	13	81	-	4	5	5
Central West-Europe	531	456	121	1,190	22	19	6	36
North Europe	49	59	4	202	6	3	2	11
South-East Europe	657	476	-	2,685	73	53	-	98
South-West Europe	2	17	27	600	2	4	13	27
EU 28	1,237	1,010	160	4,223	30	17	6	47
Europe	1,239	1,012	165	4,758	29	17	6	41

Table 60. Government revenue from forest products and services in 2010 by type of revenue and region

Region	Breakdown of expenditure on forest services			Breakdown of expenditure on forest services		
	Total revenue	Gross revenue from public forests	All other government revenue from forestry and forest products	Total revenue	Gross revenue from public forests	All other government revenue from forestry and forest products
Central East-Europe	141	29	15	23	7	7
Central West-Europe	294	197	27	15	8	15
North Europe	614	32	19	29	3	29
South-East Europe	-	-	-	-	-	-
South-West Europe	966	14	31	44	3	44
EU 28	560	266	92	13	6	3
Europe	2,014	272	93	29	6	3

Trends

Trends in the reported data are generally difficult to analyse, also due to the numerous changes in accounting procedures in the last two decades. The trends in government expenditure from 2000 to 2010 are shown in Table 61. Although the nominal European expenditure on forest services has not varied much in general over the 10 years under consideration, the variations across regions are extremely important. However, if inflation is taken into account, it emerges that real total European expenditure on forest services declined considerably from 2000 to 2010. A high level of variation across regions cannot be observed in the trend for government revenue expressed in nominal terms from forest products and services, which, as shown in Table 62, has increased consistently in all regions.

However, if inflation is taken into account, real total European revenue decreased consistently from 2000 to 2005, and almost returned to the original 2000 level in 2010. Finally, it is worth mentioning that only the data from countries that reported for all three years (2000, 2005, 2010) were taken into account in the trend analysis.

Results and conclusions

The analysis reveals extensive variability in expenditure on forest services and in revenues from forest products and forest services across Europe. However, considering the major gaps in the data, any conclusions that may be drawn would have a high margin of error. On average, Central-East and South-West Europe appear to have spent more per ha in recent years than the other regions; however the degree of correlation between total expenditure and national income is not clear. Total expenditures follow largely uncorrelated patterns across the different regions, while, in terms of Europe as a whole, real total expenditure on forest services fell considerably between 2000 and 2010. In contrast, real total European revenue decreased from 2000 to 2005 and almost returned to original 2000 levels thereafter.

Table 61. Trends in government expenditure on forest services by type of expenditure and region

Region	Total government expenditure on forest services (million EUR)			Total government expenditure on forest services per ha (EUR/ha)		
	2000	2005	2010	2000	2005	2010
Central East-Europe	97	50	40	35	18	14
Central West-Europe	1,083	1,136	1,067	34	36	33
North Europe	80	108	202	5	6	11
South-East Europe	1,280	1,133	1,133	142	125	125
South-West Europe	339	457	481	20	27	28
EU 28	2,602	2,499	2,529	39	37	38
Europe	2,878	2,883	2,922	37	37	37

Table 62. Government revenue from forest products and services by type of revenue and region

Region	Government revenue from forest products and services (million EUR)			Government revenue from forest products and services per ha (EUR/ha)		
	2000	2005	2010	2000	2005	2010
Central East-Europe	52	59	71	19	21	25
Central West-Europe	251	260	294	67	70	79
North Europe	176	350	614	8	17	29
South-East Europe	-	-	-	-	-	-
South-West Europe	459	583	861	25	32	47
EU 28	379	417	491	9	10	12
Europe	937	1,253	1,840	21	27	40

Indicator 6.5 Forest sector workforce

Number of persons employed and labour input in the forest sector, classified by gender and age group, education and job characteristics.

Introduction

Although the numbers of people employed in the forest sector have been reduced in recent decades, the sector still plays an important role in relation to employment. In the reference year 2010, the entire forestry sector in Europe provided jobs and income for at least three million people, plus the unknown number of people in informal employment who are not covered by the reported data. Hence, the forest sector makes a huge contribution to the livelihood of rural areas.

The following analysis shows that the forestry workforce in many parts of Europe, which is mainly employed in micro-enterprises, has achieved a very high level of productivity. The efficient organisation of labour and technological development is leading to lower labour intensity in all branches of the forest sector. A very high degree of variability between regions in Europe can be observed in this regard. While regions exist in which the level of mechanisation is up to 100%, the potential for further rationalisation remains very high in other regions. This will be accompanied by an increasing demand for the competencies and skills of workers, staff and entrepreneurs. The biggest challenge for the forest sector in overcoming the threat of a lack of workers with the necessary skills and desire to work in the sector lies in maintaining the necessary capacities in the workforce and motivating young entrants.

Status

Based on the officially reported figures for 2010, the entire forest sector in Europe[6] provides employment and income for around 3 million people in the forestry, wood manufacturing and paper industries. At 1.4 million, the biggest share of the jobs is provided by the wood manufacturing sector. The paper industry accounts for 790,000 jobs, and 620,000 jobs are reported for forestry itself. In the case of forestry, in particular, the reported figures are obviously not indicative of the total number of people working in the sector. A huge amount of forest work is carried out by private forest owners and their family members and by members of local communities, none of whom feature in the official employment statistics. Hence, the sector provides income and jobs for a considerably higher number of people than indicated by the statistics.

Observation of the period from 2000 to 2010, for which data are available for a considerable number of countries, reveals that the sharp decline in employment in forestry observed in previous decades appears to have slowed down and the total number of people employed in forestry throughout Europe appears to have stabilised (Figure 93).

Comparison by region shows, however, that the steady reduction of the workforce continued in Central-East Europe while the variances in the other regions are mainly due to country-specific changes in employment, e.g. while the workforce in Sweden grew by almost one third over the same period, the Baltic states in Northern Europe experienced a steady decline in the workforce.

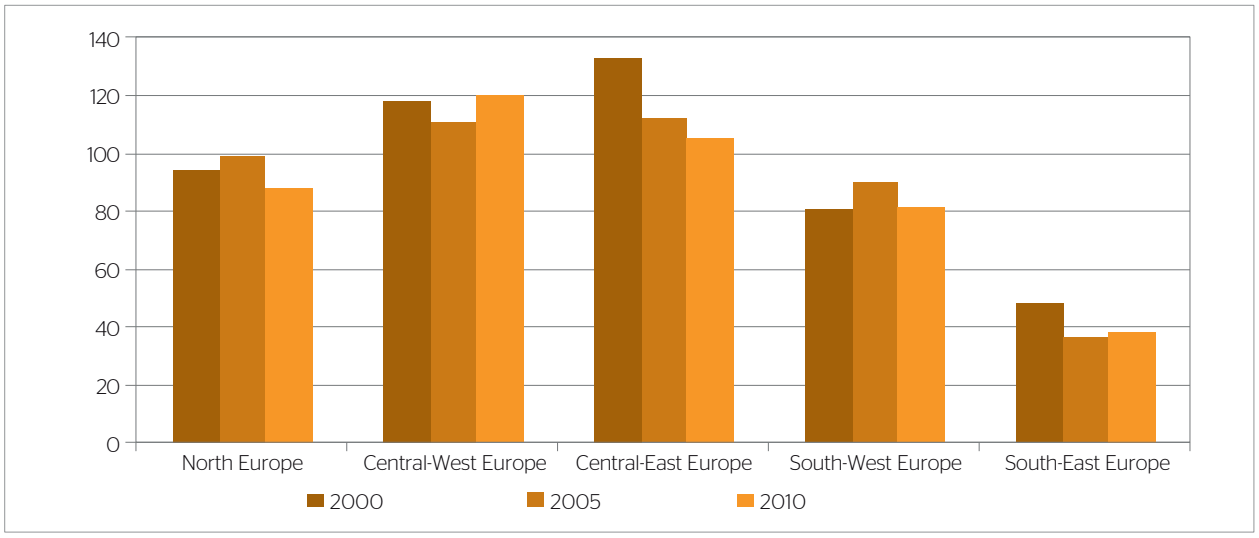


Figure 93. Development of forest-related employment from 2000-2010

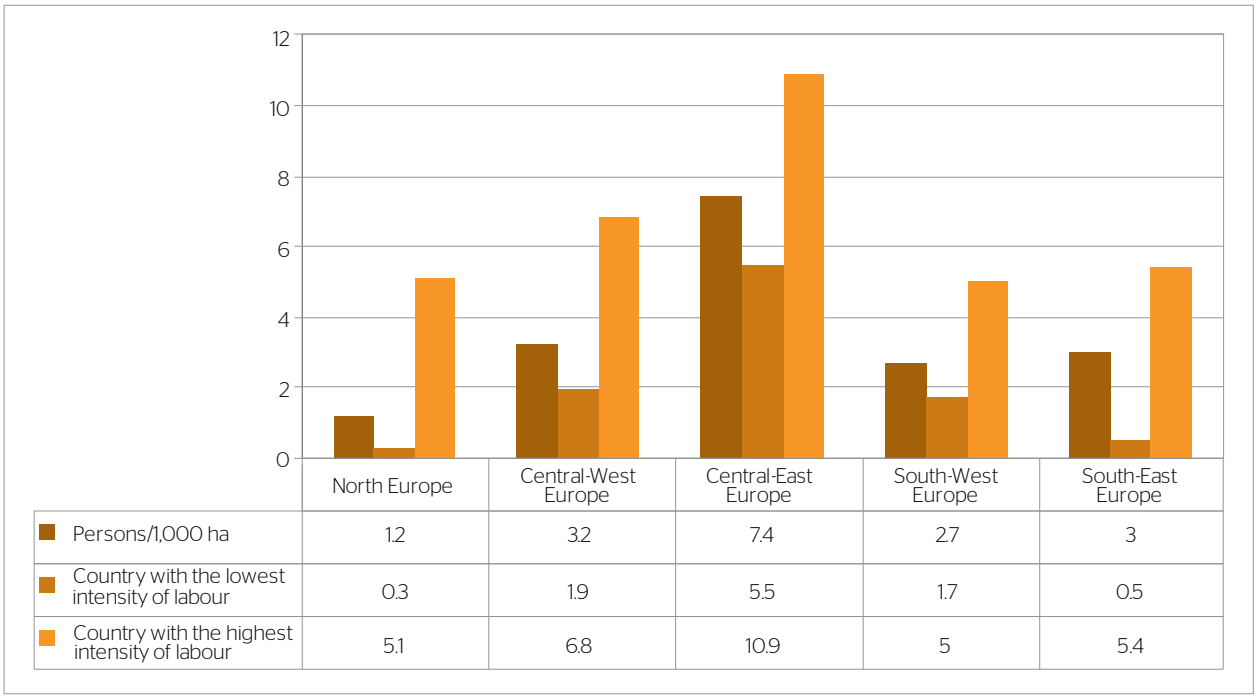
[6] Excluding the Russian Federation

A decrease of around one quarter to one third in wood manufacturing and paper production can be observed between 2000 and 2010 in most countries. However, again, employment increased in some countries, most probably due to the intensification of the industries in these countries.

The analysis shows that the forest sector in Europe is very heterogeneous and indicates that national forest and industrial policy has a huge impact on the employment situation.

The heterogeneity is best accounted for by the labour intensity in forestry. There are enormous differences between and within the regions. The lowest number of forestry employees per 1,000 ha forest can be found in North Europe. However, the range presented in Figure 94 illustrates that a high labour intensity can also be observed in this region, which is in the range of Central-East European values. The highest labour intensity can be found in Central-East Europe.

The labour intensity is, of course, a result of rationalisation and mechanisation, which, again, is reflected in productivity. Figure 95 shows productivity expressed by the harvested volume per person.



	North Europe	Central-West Europe	Central-East Europe	South-West Europe	South-East Europe
Persons/1,000 ha	1.2	3.2	7.4	2.7	3
Country with the lowest intensity of labour	0.3	1.9	5.5	1.7	0.5
Country with the highest intensity of labour	5.1	6.8	10.9	5	5.4

Figure 94. Intensity of labour in forestry in European regions in 2010 (persons per 1,000 ha)

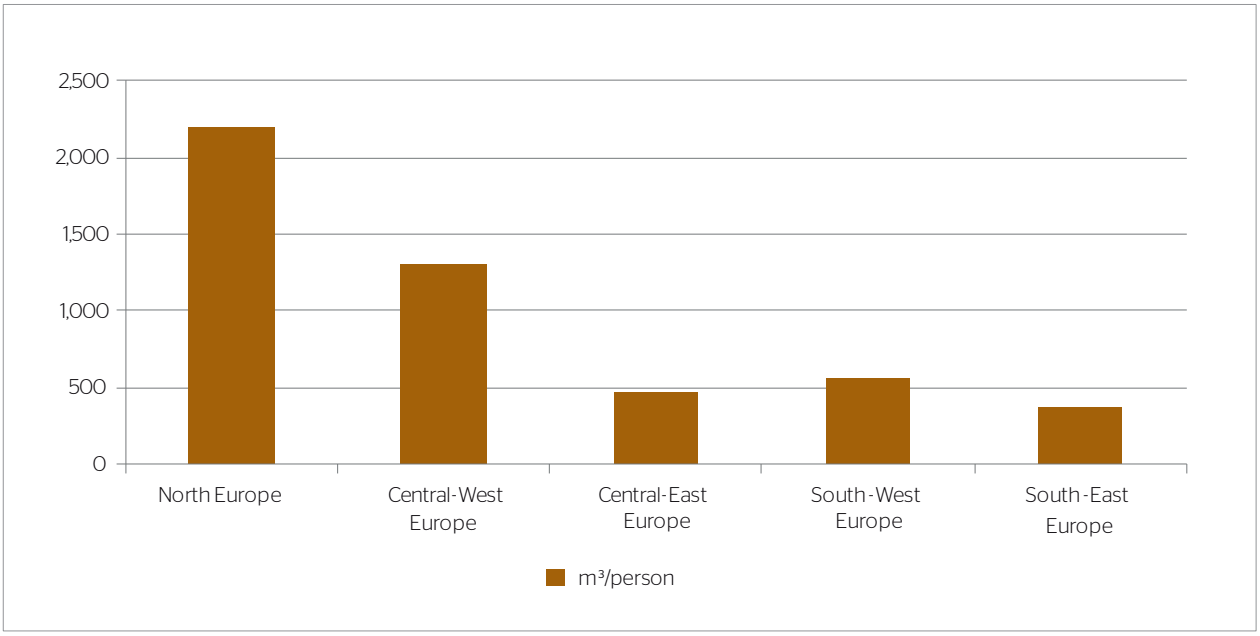


Figure 95. Productivity in European regions in 2010 (m³ harvested timber/person employed)

Since the reported employment figures are not separated into staff categories, this analysis shows the productivity of the entire system, including management and office staff.

Forestry is a profession exercised in a micro-business environment. This is indicated by the number of people who are employed in companies compared to people who work as contractors or company owners. With few exceptions, employed persons represent around three quarters of the workforce. This means that roughly one quarter of the total workforce is either self-employed or a business owner. This, again, is indicative of the structure of the sector, which is dominated by micro-enterprises and has very few medium-sized enterprises.

Company size in the wood-manufacturing sector also tends to be very small. However the structure of the wood industry differs across Europe. This can be illustrated by comparing Central-West Europe, where over 80% of the workforce are employees, with South-West and South-East Europe where less than 40% of the workforce in some countries are employees. This indicates that average company size in this sector is very small.

The qualification of the workforce is characterised by three levels of education which can be summarised as basic, vocational and professional. As a general trend for all of Europe, the forestry workforce is well educated, with about half of the workforce having completed secondary education or vocational training, and one fifth to one quarter holding a professional qualification. However, considerable variances can be observed in some countries, particularly in South-West Europe where a very high percentage of persons have only a basic education; this applies to over 80% of the workers in one country.

Overall, the majority of employees in the wood manufacturing sector have vocational training. Again, in South-West Europe alone, two thirds of the workforce have only a basic education.

A level of professional qualifications can be observed in the paper industry in North Europe where 80% of the workers have completed secondary education.

The comparison between regions and countries reveals that while the training and education of the workforce in all three sub-sectors is remarkably low in some countries, but in most countries the workforce is educated at vocational level.

Among the three sub-sectors, the highest proportion of professionally educated employees is found in the forestry sector. This reflects the fact that the forestry workforce throughout Europe consists to a great extent of staff with academic training in forest management while the wood-manufacturing sector in most countries is still dominated by small handicraft enterprises with a tradition in vocational training.

A comparison between the three sub-sectors shows that forestry is the sub-sector with the oldest workforce. The basis for the assessment is the percentage of workers in the 15-49 year age group. The proportion of older workers (over 49 years) in the forest sector in many countries exceeds around one third. Countries even exist in which over half of the workforce consists of people over 49 years old. Exceptions from this general trend are very rare, however in Belgium, for example, 85% of the workers are younger than 50 years.

In the paper industry, which can be considered as an example of industrial employment, the proportion of older workers (over 49 years old) in most countries is around one fifth. This analysis indicates that forestry faces the problem of an ageing workforce.

The workforce in the forest sector is mainly male. The percentage of male employees in most countries is in the range of 80-90%. One country in South-East Europe even reported 100 % male employment. Since the reported data do not make a distinction between the different tasks and functions of employees, it is not possible to assess whether women are generally employed in management, as it may be assumed that the percentage of female employees in forestry work is very low.

The majority of workers in wood manufacturing are male while, in contrast, in some countries females make up around half of the workforce in the paper industry.

Trend

This analysis is based on reporting data with the reference year 2010 and does not provide a sufficient basis to provide a prognosis for future development as it does not cover the trends in recent years and potential changes in the workforce.

Up to the year 2010 it could be observed that the quantitative development of the forestry workforce had stabilised after decades of sharp declines in the labour forces. This can be seen as indicative of the need for sufficient capacities in terms of staff and workers. Nordic countries, which have been in the vanguard of mechanisation and rationalisation appear to be re-employing people.

The analysis also provides some indications that the trend towards a smaller workforce will continue in some regions in the future. Where low productivity and high labour intensity can be observed, e.g. Central-East Europe, the potential for increased mechanisation remains high and will most likely be used. However, the situation in Central-West Europe appears to reflect the limitations of mechanisation. Therefore a considerable decrease in workforce is rather unlikely in the near future.

Despite the vast differences between countries, the generally high age level of the workforce poses a real threat for the future of forestry. There is no indication that the trend could be halted or reversed through the recruitment of young entrants. Maintaining capacity constitutes a real challenge for forestry, particularly in view of the fact that the quantitative development shows that, in general the retirement of older workers can only be compensated by mechanisation to a limited extent.

The general picture in 2010 was that forestry and wood manufacturing are male domains. It is not possible to predict whether there will be a considerable change in the future, however since forestry operations are unlikely to attract women in considerable numbers, a change of the ratio of operative workers to management staff with a higher ratio of women working in operations would increase the contribution of women to the forestry workforce.

The structure of the sector with micro-enterprises follows a development which evolved over recent decades. There are no indications of a change towards larger enterprises in forest operations. Hence, the focus of maintaining a competent workforce, particularly for forest operations, must remain on enterprise development in small service enterprises.

Indicator 6.6 Occupational safety and health

Frequency of occupational accidents and occupational diseases in forestry

Introduction

Occupational safety and health is much more than the prevention of accidents. Occupational safety and health also embraces the absence of both physical and mental work related illnesses. Although they are not available for all countries, the quantitative data that provide some evidence of the safety and health situation in the forest sector are accident reports.

Although accident frequency is only one aspect of safety and health, it can be considered as a key indicator for working conditions, enterprise culture and the intensity of investment in human resources. Therefore, accident statistics are frequently used to deduce information about the social conditions in enterprises and sectors. Accident frequency reflects the level of work organisation and technology. In countries where highly mechanised systems are used as the standard in harvesting operations, the number of accidents is much lower than in countries where the use of chain saws for felling and delimbing remains standard procedure.

Status

The data reported for accident frequency generally show that forestry is and remains a very hazardous profession with very high accident rates. For example, some countries in Central-West Europe report that one in eight workers suffers from an accident per year. Moreover, between 1990 and 2010, around 80 workers lost their lives annually in forest operations in Central-West Europe. A much lower accident frequency than in Central-West Europe can be observed in North Europe where accidents are reported for less than 1 in 200 workers annually in some countries.

There is a huge difference between countries – even within regions. In Central-East Europe, in particular, there are countries in which the reported annual accident rate per 1,000 workers is 30, while others report an annual rate as low as 2, which is on the level of some North European countries.

The data show that between 2000 and 2005 a reduction was achieved in the number of accidents could be achieved. However, in the following years from 2005 to 2010 the accident frequency in Central-West, Central-East and South-East Europe remained on the level of 2005 (Figure 96). The total number of accidents even increased in some countries during the last five years of the reporting period.

Trends

Remarkably, a further reduction was achieved in the accident frequency over the last five years of the reporting period, even in North Europe where the accident rate is already the lowest in all European regions due, not least, to the dominance of mechanised harvesting systems. On the other hand, there were no further improvements in the safety situation in Central-West, Central-East and South-East Europe between 2005 and 2010.

As illustrated by the Nordic countries where high levels of mechanisation account for the reduction in the exposure to accident risks related to motor-manual harvesting systems, mechanisation is one way of reducing the accident risk of forestry work. In addition to differences in the efforts made to implement preventive measures in the respective national forest sector this may explain why countries in North European report a much lower accident frequency than most countries in other European regions where motor-manual systems are still the most commonly used harvesting procedures.

A noteworthy observation from the data analysis is that many countries failed to provide information about the safety and health situation in their forest sectors. Solid analyses of the actual situation as well as a solid data assessment form the basis of any effective preventive measures. These are urgently required to make forestry work safer and make the forestry sector an attractive professional environment.

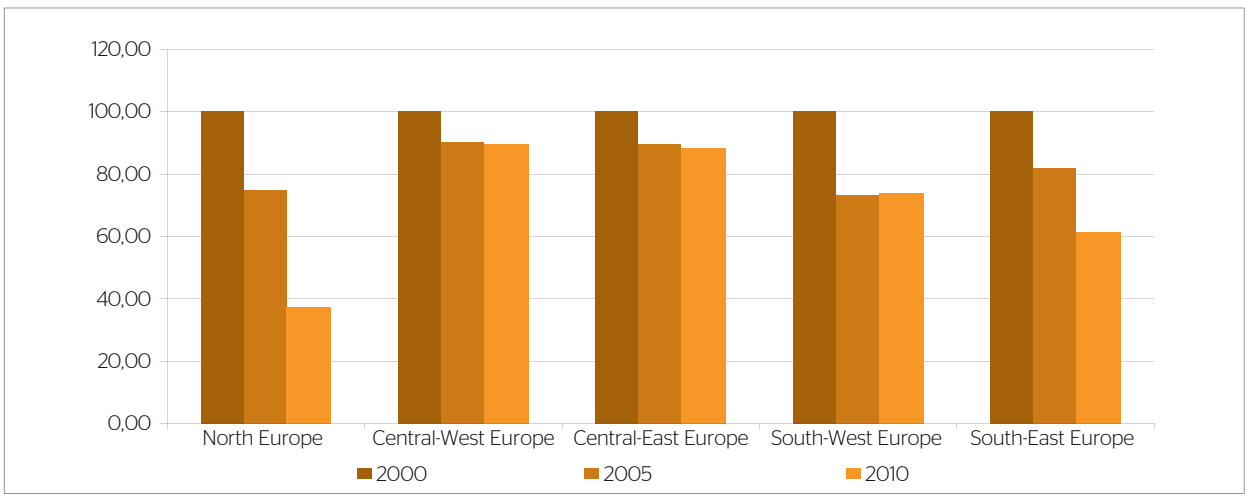


Figure 96. Development of number of accidents in European regions from 2000 to 2010. Frequency per region expressed as percentage of the reference year 2000, which is set to 100%

Indicator 6.7 Wood consumption

Per capita consumption of wood and products derived from wood

Introduction

Wood consumption includes woodfuel, sawn wood, wood-based panels, paper and paper board, and (industrial) roundwood. It estimates the volumes of wood consumed in each region based on the local production level and net trade (exports and imports). The data are reported in cubic metres of roundwood equivalent per 1,000 inhabitants.

Sustainable forest management in Europe is directly contingent on sustainable markets for forest products and vice versa. The consumption of roundwood and all of its products and by-products is a factor in the sustainable development of the forest sector. Profitability in most forests is dependent upon sales of roundwood, and, to a growing extent, sales of forest residues for energy. The revenue from sales of wood supports most activities and treatments in forests. The price of saw logs is particularly important for the profitability of forest operations, thus the demand for solid wood products plays a crucial role for the mobilisation of pulpwood and forest residues. In this context it is worth noting that the recognition of the environmental benefits of the use of wood in construction is slowly increasing throughout Europe. This could result in far greater consumption in the future. Green building, which is often promoted by governments as well as the forest sector, is based on the greater use of renewable wood in structural applications as well as for insulation and decorative purposes.

Status

The wood consumption level varies between the European regions, ranging from 713 m^3 per 1,000 inhabitants in Southern-East Europe to 2,597 m^3 per 1,000 inhabitants in North Europe in 2010 (Table 63 and Figure 97). This variation is largely due to cultural differences in the use of wood and the balance between local forest resources and market needs. In particular, building with wood is widely practised in North Europe where wood represents between 85% and 95% share in the single-family housing market (Norway, Sweden, Finland). In contrast, building with wood is much less common in Southern Europe.

Wood consumption in Europe remains well below forest growth. Thus, harvests fall short of annual growth by approximately 36%. This means that one-third of the annual growth is added to the forest growing stock every year. As a result, with continued sustainable forest management, Europe will continue to be able to support increasing rates in the consumption of wood and paper products as well aswood-based energy. However, it should be noted that not all growth may be harvestable for economic and technical reasons, set-aside for environmental reasons, etc.

Table 63. Consumption of forest products 1990-2010

Region	Cubic metres of roundwood equivalent per 1,000 population				Annual change	
	1990	2000	2005	2010	1990-2010	2005-2010
Central East-Europe	1,903	2,632	2,926	2,597	1.74%	-2.36%
Central West-Europe	1,433	1,520	1,567	1,422	-0.04%	-1.92%
North Europe	447	494	703	805	3.33%	2.75%
South-East Europe	891	1,188	1,237	988	0.57%	-4.39%
South-West Europe	501	542	656	713	1.98%	1.67%
EU 28	974	1,113	1,225	1,145	0.90%	-1.34%
Europe	651	827	930	856	1.53%	-1.65%

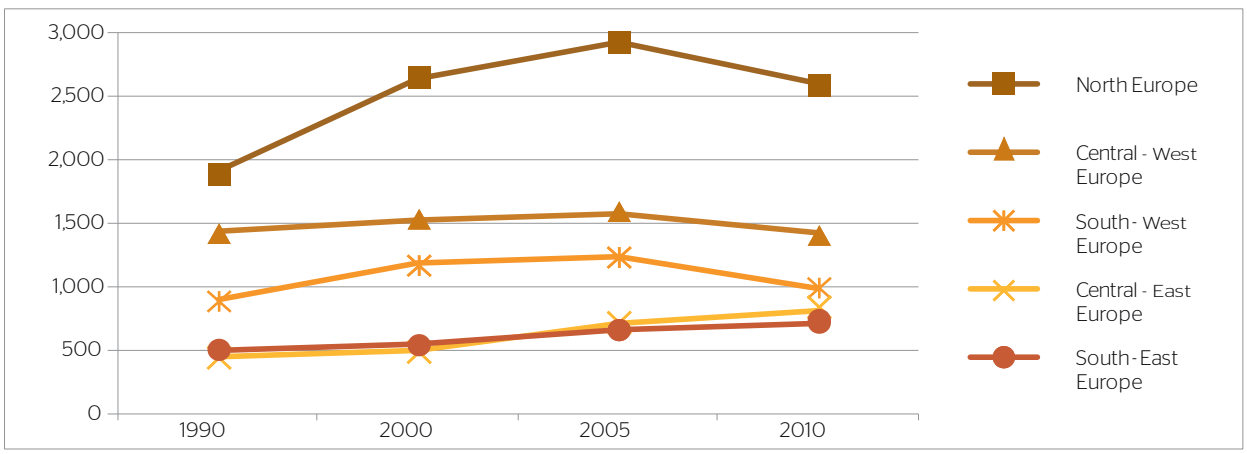


Figure 97. Wood consumption increased in all regions between 1990 and 2010

Trends

The trends in wood consumption depend on overall economic development, particularly in the construction sector, and on the development of wood market share.

Wood consumption increased in all regions between 1990 and 2010 (Table 62). Specifically, the different European regions generally experienced steady growth between 1990 and 2005 (while Central-West Europe experienced a stagnation in consumption over the period as a whole, there was a considerable increase between 1990 and 2005). This growth was partly supported by public policies which encouraged the use of wood in the construction and renovation sector through the implementation of energy efficiency policies. Wood consumption was also driven by European policies for the promotion of renewable energy sources. Indeed, woody biomass represents one of the most important sources for achieving the 20-20-20 Targets set by the European Union. However, and despite these favourable policies, between 2005 and 2010, wood consumption decreased in North, Central- and South-West Europe. This development is mostly the result of the financial and economic crisis of 2008-2009 which had a strong impact on final demand, in particular the drop in housing starts and ensuing fall in the demand for construction timber. Wood consumption continued to grow in Central and South-East Europe, although per capita consumption remain the lowest in Europe. Structural (downward) trend breaks in the consumption of (mainly graphical) paper added to the effects of the economic downturn. Hence, FAOSTAT figures indicate a drop in the total consumption of paper and paperboard of around 20 million m^3 of roundwood equivalents for Europe for the period 2010 to 2013. As a matter of fact, the only growth in consumption in Europe between the years 2010 and 2013 was related to fuel-wood.

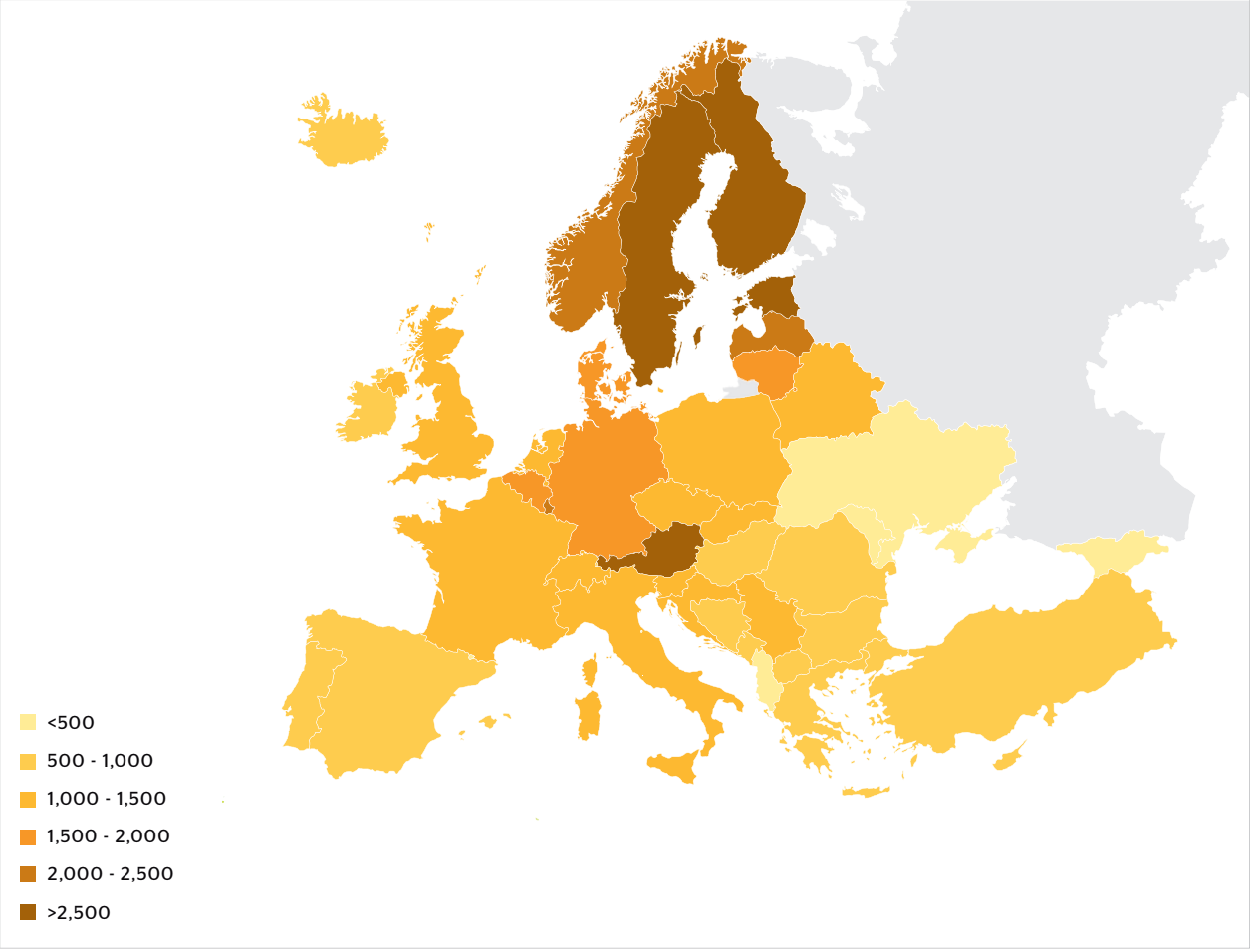


Figure 98. Wood consumption per capita (m^3/1,000 habitants)

Indicator 6.8 Trade

Imports and exports of wood and products derived from wood

Introduction

The trade in wood reflects exchanges of wood products based on the locations of production and consumption, and includes exports and imports of roundwood, sawn wood, wood-based panels, paper and paperboard. A vigorous trade in forest products is essential for sustainable forest management as it enables renewable wood and paper products to meet the needs of consumers in Europe and elsewhere. Forestry often suffers from low profitability, and this has had a negative impact on the sustained development of the sector. The fact that export values rose in all regions over the approximately 20 years covered by this analysis is a positive sign.

Status

Europe is a net exporter of primary wood and paper products. In 2010, there was a trade surplus of EUR 4.5 billion, which contrasts with the trade deficit of EUR 1.6 billion in 2000 (Table 68). However, considerable differences exist between the different European regions. The surplus is mostly due to the Nordic countries, which export a considerable share of their local production (e.g. sawn wood and paper products) to other European countries and, increasingly, outside the European Union (e.g. to China). In contrast, Central-West Europe is a net importer of primary wood and paper products, however its deficit was halved between 1990 and 2010 (Figure 101). Finally, while the trade deficit decreased in South-West Europe over the last reporting decade (2000-2010), Central-East Europe and South-East Europe recorded a growing deficit over the entire survey period (1990-2010).

Trends

The volume of wood and wood product exports in most regions, and generally in Europe, suffered a downturn during the economic crisis as construction activity slowed dramatically. Having doubled from 1990 to 2005, exports stagnated in the period around 2010. As was the case with wood consumption, the South and East regions coped best with the economic slowdown, and even recorded positive export growth, albeit at lower rates (Table 64). The value of exports also showed a slight increase in the period 2005 to 2010 in both the EU-28 and Europe as a whole. The South-East region was responsible for this (albeit minor) growth while North and Central-West Europe recorded slightly decreasing exports in terms of value (Table 65).

As was the case for exports, following significant increases up to 2005, imports were negatively affected by the 2008-2009 economic crisis both in most regions and in Europe as a whole. As a matter of fact, as can be deduced from Table 66, the contraction in import volumes for the EU-28 and Europe as a whole during the period from 2005 to 2010 was greater than for exports. The East regions were the only ones to record any growth in import volumes during the 2005-2010 period (Table 66). Europe has developed from a net-importer to a net-exporter of primary wood and paper products. For the EU-28 and Europe as a whole, this shift occurred from 2005, chiefly as a result of the contraction in consumption and imports. The development of import values largely mirrors that of import volumes. Again, following increases up to the economic crisis, there were contractions in all regions apart from the East ones. As is apparent from Table 67, import values remained largely unchanged for the Europe as a whole. Due to concerns about illegal logging and the deforestation of tropical forests, demand for tropical timber products and the corresponding volume of imports into Europe have declined since 2000.

There has been a trend for the substitution of tropical timber with timber from temperate and boreal forests with oak being widely used as a substitute for tropical hardwood timber. Moreover, within the EU, there has been a shift from imports of tropical timber to further processed products. A substantial part of these further processed tropical timber products come from Asia. Indeed, imports of primary and secondary processed wood products have increased enormously, i.e. by over 30% in value since 2005. Most of these increased imports come from China, whose exports to Europe have grown by over 60% since 2005. The European Union has instituted policies to halt the trade in illegal timber through the Forest Law Enforcement, Governance and Trade programme and its Timber Regulation. These policies aim to increase the legal trade in sustainably produced forest products. It is still too early to say what kind of impact these policies will have on trade patterns.

Table 64. Exports of primary wood and paper products 1990-2010 in volume

Region	Million cubic metres of roundwood equivalent				Annual change	
	1990	2000	2005	2010	1990-2010	2005-2010
Central East-Europe	106	164	178	162	2.37%	-1.89%
Central West-Europe	109	157	203	194	3.24%	-0.86%
North Europe	13	36	51	57	8.58%	2.11%
South-East Europe	20	30	39	45	4.70%	2.73%
South-West Europe	6	9	14	18	6.47%	4.66%
EU 28	253	395	485	475	3.55%	-0.41%
Europe	236	368	449	442	3.55%	-0.31%

Table 65. Exports of primary wood and paper products 1990-2010 in value

Region	Million Euro				Annual change	
	1990	2000	2005	2010	1990-2010	2005-2010
Central East-Europe	15,031	23,752	24,980	24,370	2.72%	-0.49%
Central West-Europe	17,355	30,106	34,927	34,663	3.92%	-0.15%
North Europe	1,037	3,644	5,920	7,445	11.57%	4.69%
South-East Europe	3,065	5,771	7,296	8,273	5.67%	2.55%
South-West Europe	705	1,153	1,688	2,336	6.88%	6.72%
EU 28	37,193	64,431	74,811	77,086	4.13%	0.60%
Europe	34,767	60,443	70,507	72,870	4.20%	0.66%

Table 66. Imports of primary wood and paper products 1990-2010 in volume

Region	Million cubic metres of roundwood equivalent				Annual change	
	1990	2000	2005	2010	1990-2010	2005-2010
Central East-Europe	28	53	62	48	3.06%	-5.33%
Central West-Europe	205	241	264	246	1.03%	-1.40%
North Europe	6	25	40	48	12.14%	3.90%
South-East Europe	58	83	91	78	1.66%	-2.91%
South-West Europe	11	20	30	34	6.54%	2.36%
EU 28	307	420	487	454	2.19%	-1.40%
Europe	292	392	450	414	1.96%	-1.64%

Table 67. Imports of primary wood and paper products 1990-2010 in value

Region	Million euro				Annual change	
	1990	2000	2005	2010	1990-2010	2005-2010
North Europe	3,182	5,454	6,773	6,126	3.71%	-1.99%
Central West-Europe	31,046	41,221	42,818	41,392	1.61%	-0.67%
Central East-Europe	551	3,798	6,117	7,939	15.98%	5.35%
South-West Europe	7,845	12,371	13,296	11,781	2.28%	-2.39%
South-East Europe	1,603	3,228	4,382	5,325	6.90%	3.98%
EU 28	41,355	61,244	67,463	65,518	2.59%	-0.58%
Europe	44,227	66,072	73,406	72,563	2.79%	-0.23%

Table 68. Net-exports of primary wood and paper products for 1990-2010 in volume

Region	Million cubic metres of roundwood equivalent			
	1990	2000	2005	2010
Central East-Europe	78	111	115	114
Central West-Europe	-95	-83	-62	-52
North Europe	7	11	12	9
South-East Europe	-39	-53	-52	-33
South-West Europe	-5	-11	-16	-16
EU 28	-54	-25	-2	21
Europe	-55	-24	0	28

Table 69. Net-exports of primary wood and paper products for 1990-2010 in value

Region	Million euro			
	1990	2000	2005	2010
Central East-Europe	11,850	18,299	18,207	18,243
Central West-Europe	-13,692	-11,115	-7,891	-6,730
North Europe	486	-155	-197	-494
South-East Europe	-4,780	-6,600	-6,000	-3,508
South-West Europe	-898	-2,075	-2,694	-2,989
EU 28	-7,034	-1,646	1,424	4,523
Europe	-6,588	-800	3,044	7,353

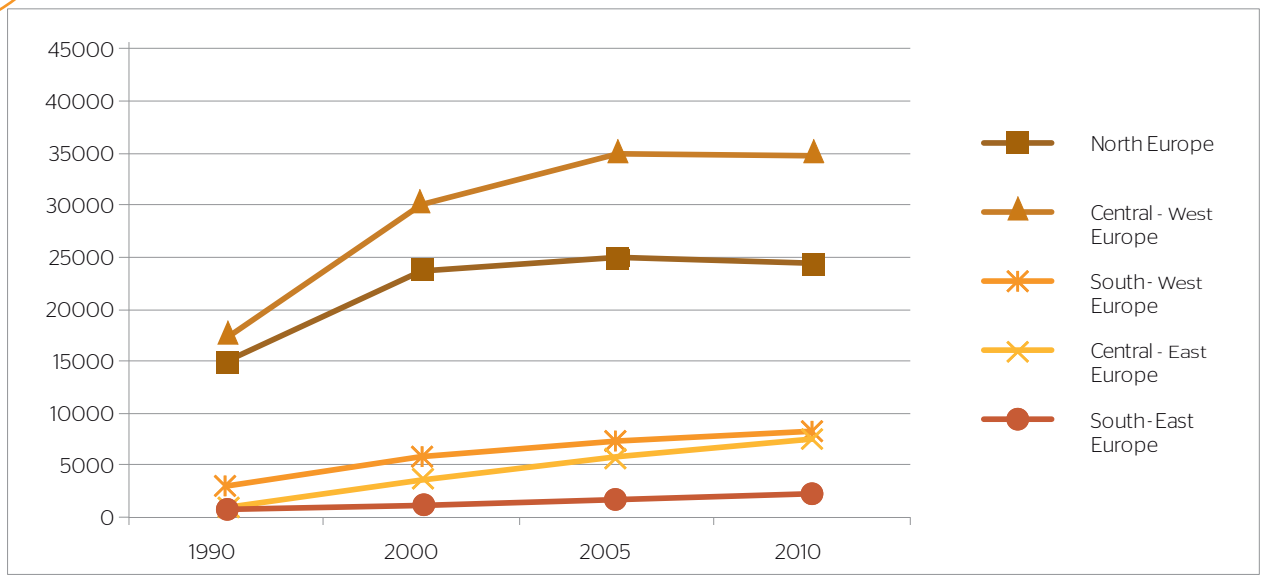


Figure 99. Exports (million EUR) 1990-2010

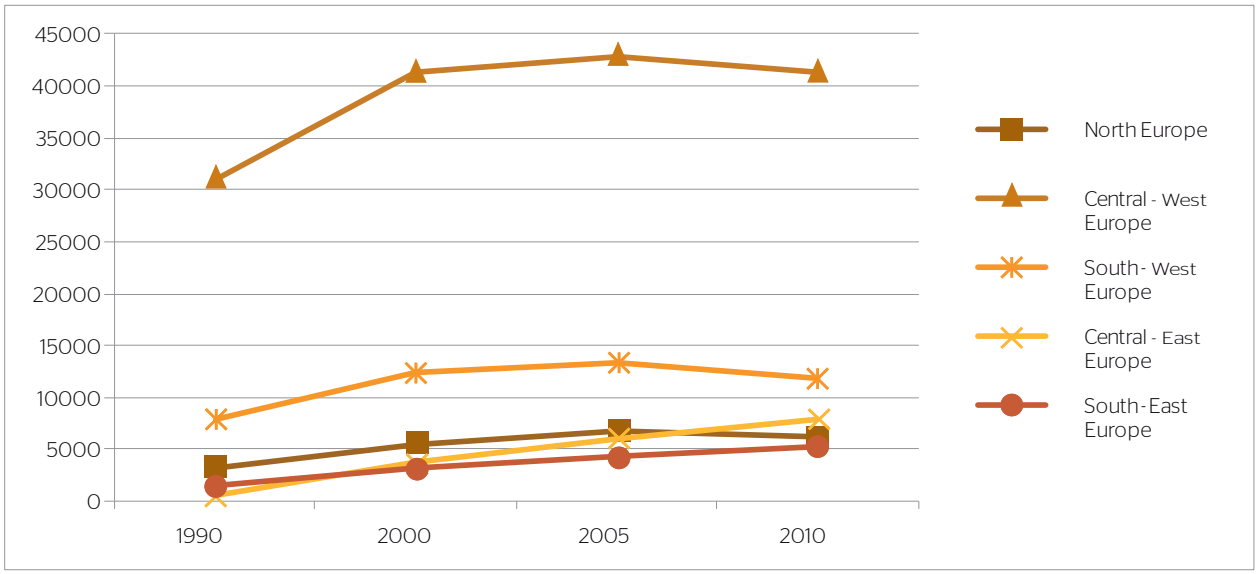


Figure 100. Imports (million EUR) 1990-2010

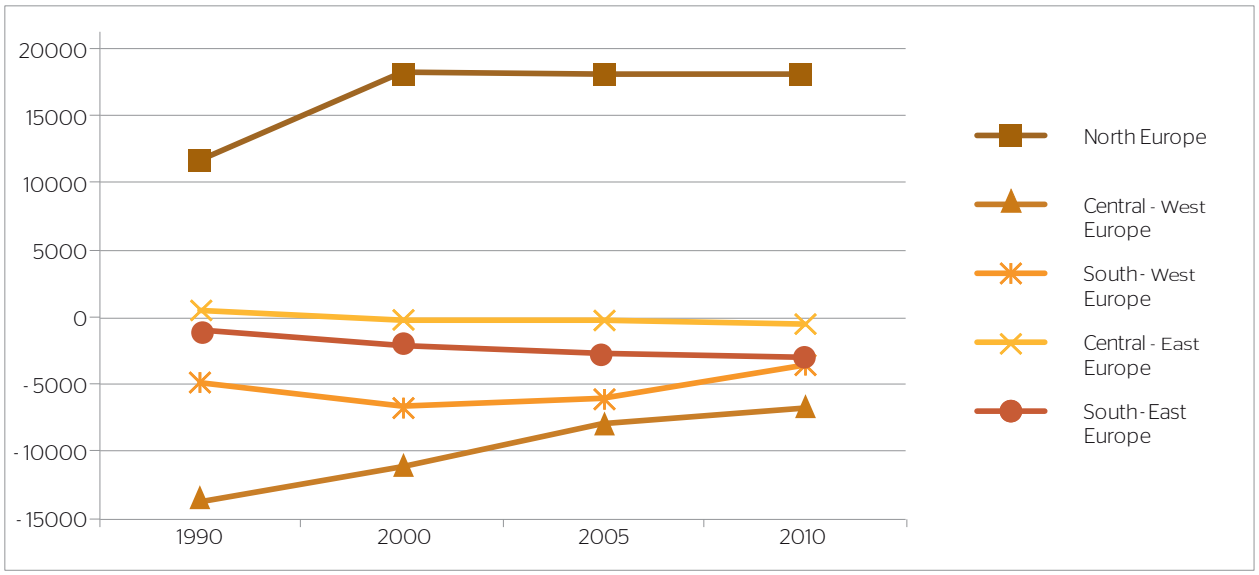


Figure 101. Net trade (million EUR)

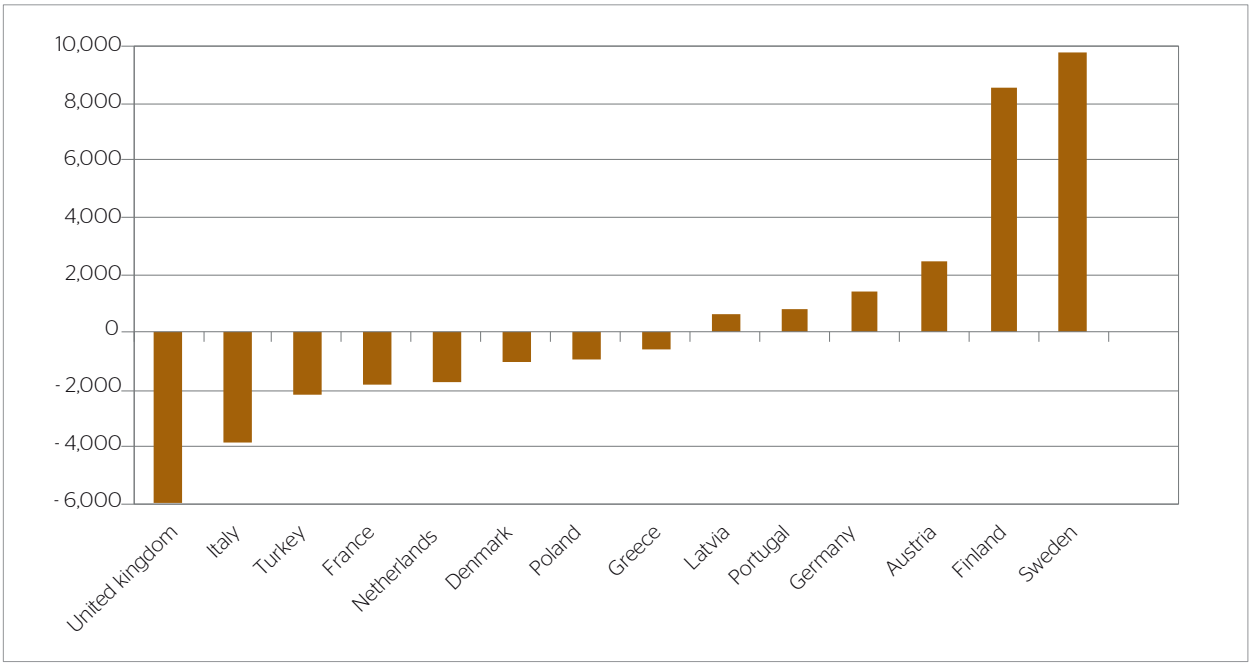


Figure 102. Net trade (million EUR) for selected countries

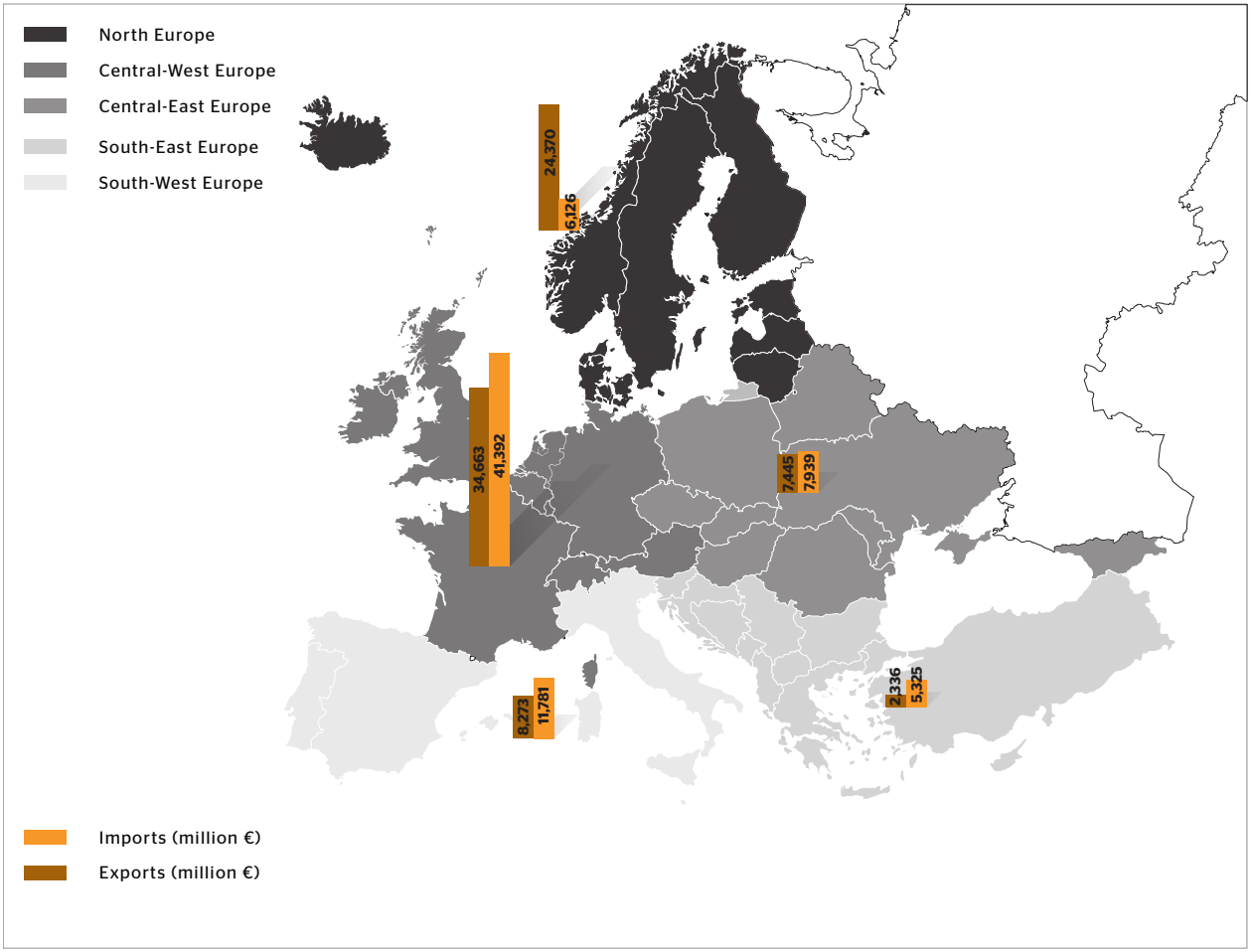


Figure 103. Trade in wood and wood products 1990-2010

Indicator 6.9 Energy from wood resources

Share of wood energy in total energy consumption, classified by origin of the wood

Introduction

Wood energy as reported under Indicator 6.9 can have many different forms and origins. Modern wood fuels can be solid or liquid and derive from many different sources. Hence, forests are only one source among many others, such as other wooded land and trees outside forests, residues from wood processing, post-consumer recovered wood, and specially prepared processed woodfuels, such as pellets, briquettes and charcoal.

The objective of Indicator 6.9 is to measure the relative importance of wood energy for both the energy and forestry sectors. Information for Indicator 6.9 cannot be taken directly from international energy statistics as these include woody biomass under the general definitions of solid biomass. Details on wood energy sources also complement energy statistics as these focus on energy consumption and transformation rather than the underlying supply patterns and fuel origins. Some countries appear to have been required to report energy data from official energy statistics, thus the data they provided for this indicator may not be fully consistent with the forest sector data presented in other indicators.

The available data provide sufficient information about North and Central-West Europe as data were submitted for all countries in these two regions. All of the information on hand for the other regions dates from 2009. However, this data covers less than half of the countries and accounts for only one third of the forest area. In addition, the consumption figures for Hungary (Central-East Europe) are obviously incorrect as they indicate a consumption of 2,000 million tons. More data are available for 2011 as wood-based energy is indicated as part of the total share of the energy consumption within a region, however there are no figures for total energy consumption within the respective countries. Data for the years 2009 and 2011, as presented in the Output Tables, constitute the basis for the analysis.

Table 70. Annual wood energy consumption, total and per capita

Region	Million metric tonnes dry matter in 2011	Metric tonnes dry matter per capita	
		2009	2011
Central East-Europe	56.3	1.70	1.86
Central West-Europe	67.8	0.24	0.27
North Europe	24.1	-	0.20
South-East Europe	-	-	-
South-West Europe	16.1	-	0.16
EU 28	-	-	-
Europe	-	-	-

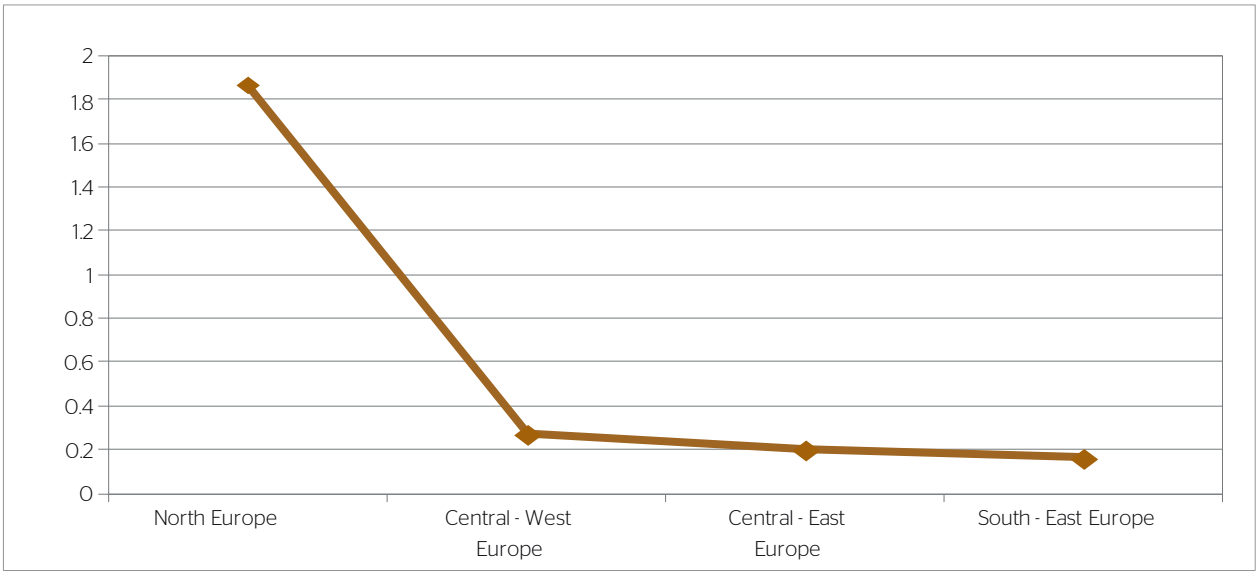


Figure 104. Annual wood energy consumption by region (metric tonnes dry matter per capita)
Note: Only regions, for which the available data represent over 80% of the population are included

Status

The results for the regions are based on data for countries representing over 80% of the population in the respective region. The total wood energy consumption for the two regions North and Central-West Europe is around 124 million tonnes (Table 70). Central-West Europe, which has a much larger population, consumes around 20% more wood-based energy than North Europe. However, North Europe has a much higher per capita consumption, which reflects the (general) abundance of forest resources in this region. This circumstance is underlined in Figures 104 and 105, which presents per capita consumption per region and country.

Wood fibre patterns in energy production reflect the prominence of the wood-based industry to some degree (Figures 106 and 107). Hence, countries with a well-developed wood-based industry, such as Austria, Czech Republic, Estonia, Finland and Sweden, have a high proportion of co-products and residues in their wood-based energy production. The 3 countries with the highest share of processed wood-based fuels in the wood-based energy mix are all major importers of wood pellets.

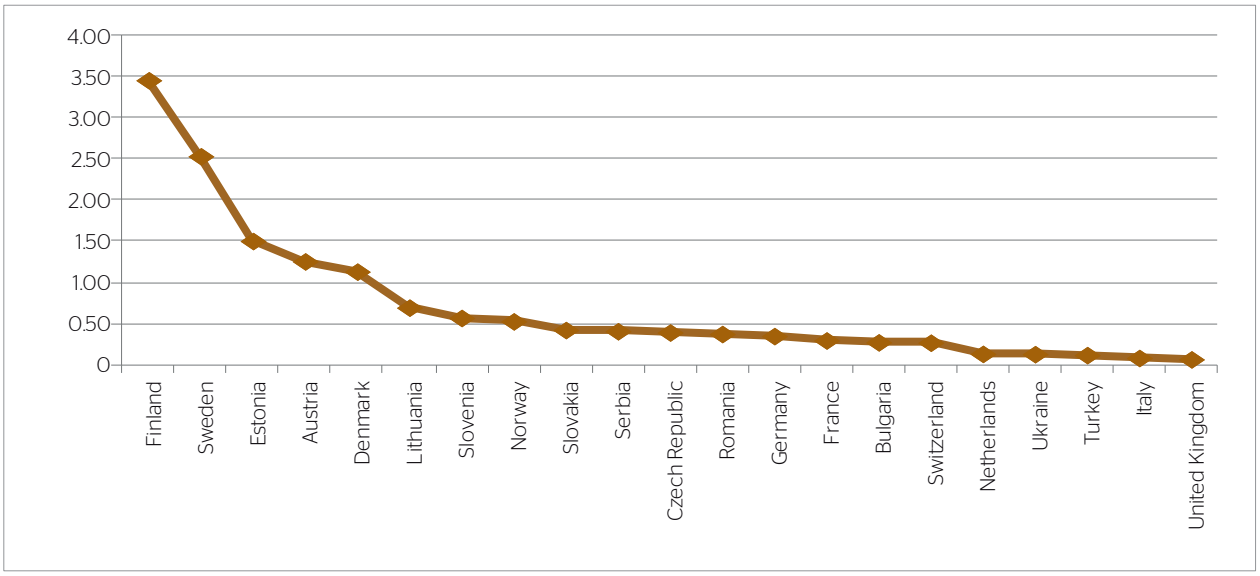


Figure 105. Annual wood energy consumption by country (metric tonnes dry matter per capita)

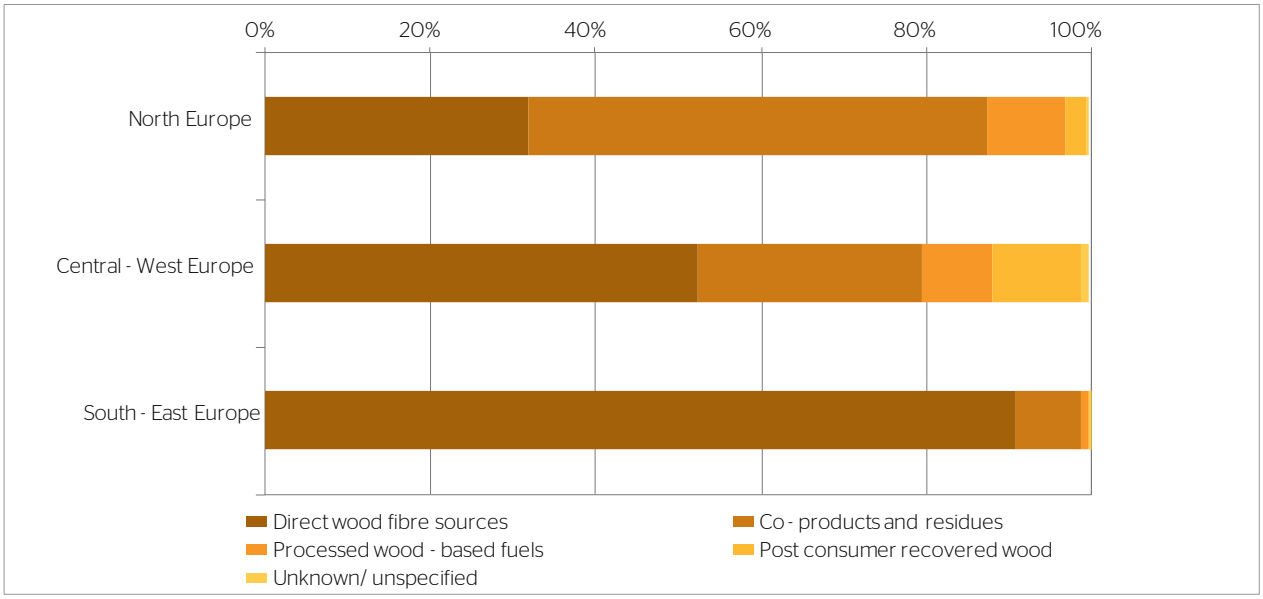


Figure 106. Wood fibre patterns for energy production by region (in percent)
Note: Only regions, for which the available data represent over 80% of the population are included

Trends

Annual per capita wood consumption increased in both North and Central-West Europe between 2009 and 2011, a development that reflects, in part at least, the drive to meet renewable energy targets (Table 69). However, in terms of value, per capita consumption in the European countries (excluding the Russian Federation) that participated in the Joint Wood Energy Enquiry (JWEE) in 2011 remained stable between 2009 and 2011 (Table 71). While fuel wood consumption per rural inhabitant has decreased overall (with the exception of North Europe and Central-West Europe), a notable increase was recorded in per capita consumption of wood pellets.

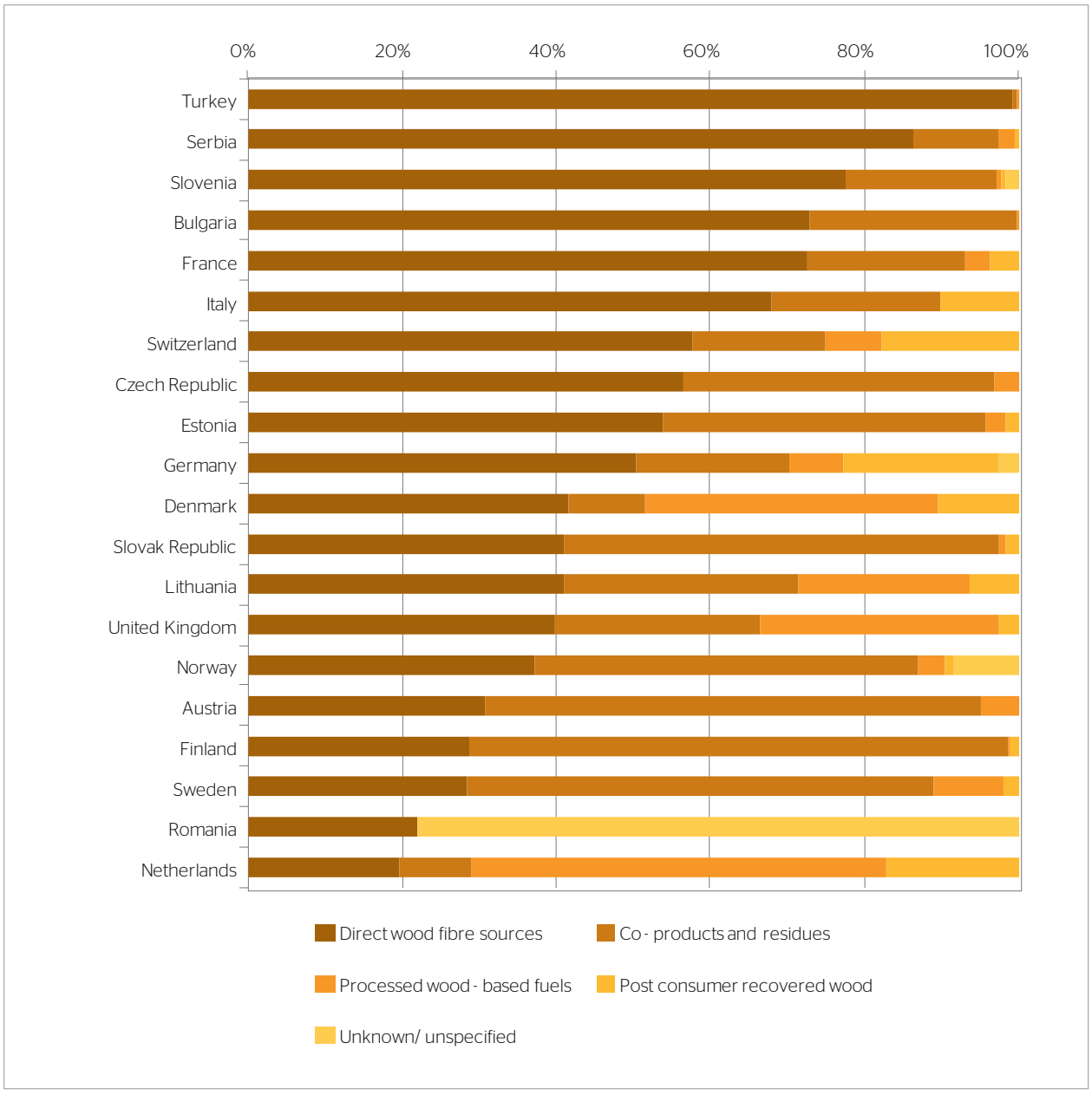


Figure 107. Wood fibre patterns for energy production by country (in percent)

Table 71. Wood energy intensity in Europe. Source: JWEE

Wood energy intensity	2009	2011
Average wood energy consumption (m^3/capita)	0.71	0.68
Fuelwood consumption per rural inhabitant (m^3/inhabitant)	0.88	0.77
Pellet consumption per inhabitant (kg/capita)	18.71	24.80

Source: JWEE 2011 (http://www.unece.org/forests/jwee.html)

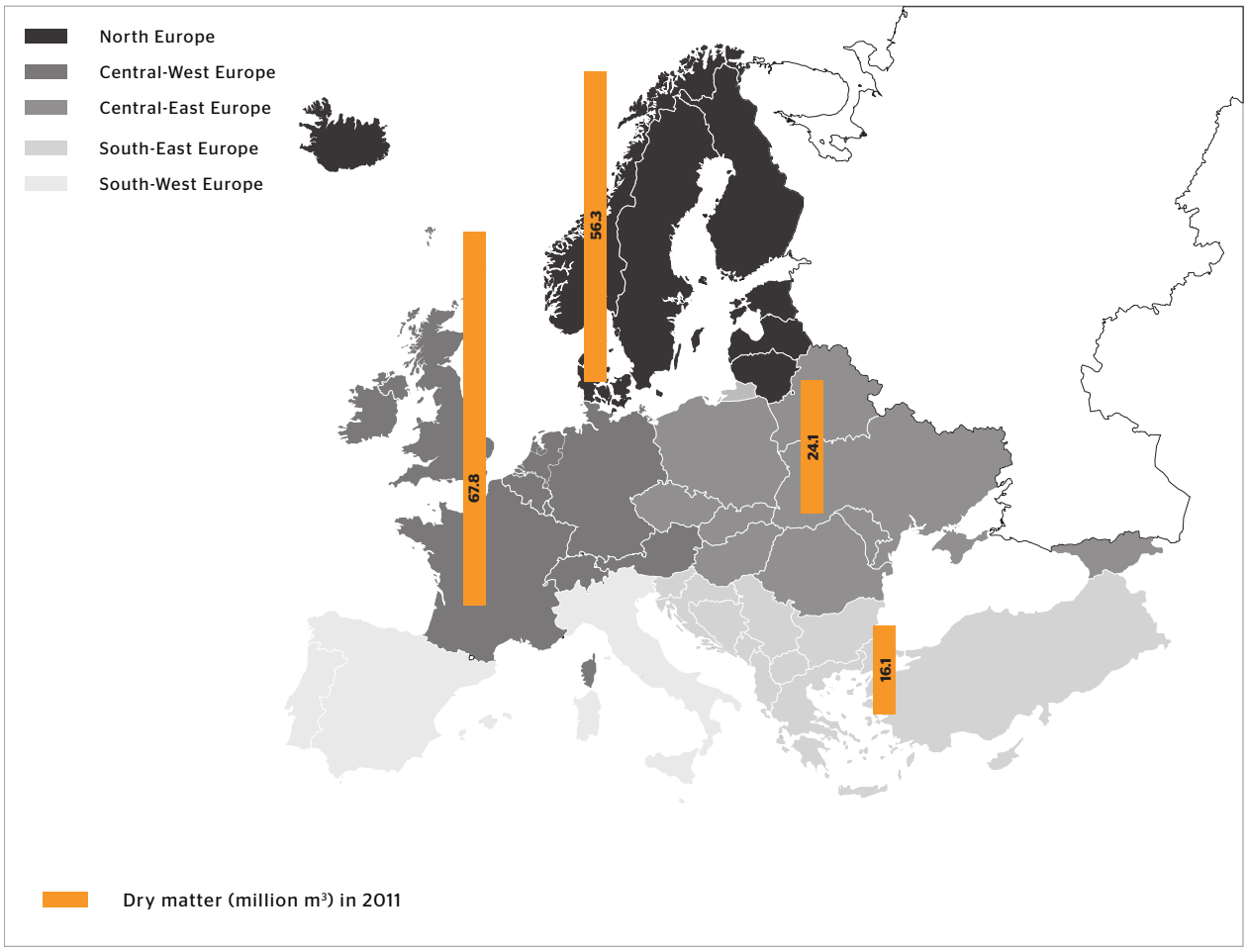


Figure 108. Annual wood energy consumption

Indicator 6.10 Accessibility for recreation

Area of forest and other wooded land, to which the public has a right of access for recreational purposes, and indication of the intensity of such use

Introduction

Access to forests enables people to benefit from the recreational value of forests, which, in turn, contributes to the quality of life. This value includes health benefits (both physical and mental) and the enjoyment of recreational activities. Accessibility for recreation is granted through a legal right of access, customary rights and other de facto forms of access.

The intensity of use (measured in million visits per annum) can provide an indication of the value of these benefits, however the value may also depend on the nature and duration of the visits.

Status

A total of 32 countries out of 43 reported on the area of forest and other wooded land available to the public for recreational purposes. In the majority of these countries, the public had access to at least 90% of their forest and other wooded land for recreational purposes in 2010. In terms of regional distribution, the reported data provide quite an accurate reflection of the situation in North and Central-West Europe where the majority of countries reported these data. In contrast, the data for Central-East, South-East and, particularly, South-West Europe are incomplete and should be treated with caution. (Table 72).

Most countries (14 of the 24 that responded on this indicator) reported that 3% or less of their forest and other wooded land area had recreational use as a main management goal in 2010. In 5 countries this area exceeded 10% of the forest and other wooded land area. Latvia reported that over 47% of its forest and other wooded land area is primarily designated or managed for recreation and is followed by Bulgaria (21%), Iceland (18%) and Belarus (17%). At the other extreme, Serbia, Sweden and Denmark report that less than 0.5% of their forest and other wooded land area has recreational use as a main management goal.

Only 15 countries were able to provide quantitative estimates of intensity of use measured in terms of the number of visits. These data correspond to the latest available estimates in these countries. The values range from 0.2 million visits in Portugal (2012) to 1,500 million visits in Germany (2012). Direct comparison of the data is complicated in most cases, however, as different methodologies are used for estimating the number of visits and most of the data relates to different reference years (from 2000 to 2013).

Trends

Forest area with public access for recreational purposes has been increasing steadily since 1990 in most countries, however the changes in the period 2005-2010 were very marginal.

The forest area with recreational use as a main management goal has steadily increased since the 1990s in most countries; the increase has been more pronounced since 2005, particularly in countries in the North Europe and South-East Europe regions.

The data on the intensity of use (number of visits) relies on different sources, methodologies and reference years, hence it is difficult to draw reliable conclusions about the related trends.

Table 72. Area with public access and area managed for recreational use by region

Region	Area with access available to the public for recreational purposes (2010)		Percentage of forest and other wooded land area with recreational use as a main management goal (2010)
	Percentage of forest and other wooded land area with access available to the public for recreational purposes (2010)	Data coverage expressed as percentage of total forest and other woodland area of the region	
North Europe	98.0	100	4.6
Central-West Europe	57.3	96.6	2.0
Central-East Europe	69.1	77.3	8.3
South-West Europe	N/A	0.0	N/A
South-East Europe	95.8	32.8	7.7
EU-28	68.6	83.9	4.6
Europe	82.3	65.9	5.7

Note: The information is not summarized for South-West Europe as the reported data cover less than 5% of the region's total Forest and Other Wooded Land (FOWL).

Indicator 6.11 Cultural and spiritual values

Number of sites within forest and other wooded land designated as being of cultural or spiritual values

Introduction

A diverse range of cultural and spiritual values are associated with forested landscapes, individual forests, and particular sites and features within forests. Forests can provide a sense of connectedness with the natural world and a symbolic link between the past, present and future. They are a source of artistic inspiration and a backdrop for myths and stories that have become embedded in the regional cultures of Europe. Local people may value forests and trees for the contributions they make to a community's 'sense of place' and to engendering a shared feeling of ownership and belonging. The structural diversity of forests helps to lend them the qualities of mystery, complexity and wildness and to provide environments for children to play and learn about nature and themselves. They may also be seen as restorative environments that allow people to relax and unwind. Many of these benefits are intangible and difficult to define and quantify. Nevertheless, they may be expressed in tangible ways, for example the aesthetic contribution of forests to the landscape can encourage recreation and tourism, thereby helping to support local economies, particularly in remote and rural areas.

The Fourth Ministerial Conference (Vienna Summit, 2003) fully recognised the importance of the cultural and spiritual values of forests and specified the means of preserving and enhancing them through sustainable forest management (Resolution V3). Indicator 6.11 quantifies one aspect of these diverse benefits by reporting the number of sites within forests and other wooded land that are officially recognised for their cultural or spiritual values. Four categories are applied here: 'Cultural heritage', 'Forested landscapes', 'Trees' and 'Other sites'.

The 'Cultural heritage' category includes archaeological sites and features associated with human artefacts, historical sites and features, such as the remains of old buildings and monuments and locations of historical importance (e.g. battle sites), even if they have no trace of these events. Cultural heritage sites located in forests can be further divided into sites 'of the forest' that are associated with historic forest management, and sites 'in the forest', in which the forest itself it not an important aspect of the heritage value.

Sites 'of the forest' which are associated with historical forest management include boundary banks and dykes, charcoal-burning platforms, saw pits, some bloomery and blast furnace sites, tar production sites, kilns, water mills and lades, and features associated with game management and for transporting forest products. The forest was an essential component in their use and they would not have been created if the forest had not existed. The kinds of historical forest management, with which these sites were associated, can include ancient wood pastures, historic planted forests, and stands of old industrial or pre-industrial coppices, coppice with standards, pollards, shredded or other 'working trees' for the production of acorns, fodder, tar, resins and other products. Evidence of such management may be found in 'organically evolved landscapes' within the 'Forested landscapes' category.

Cultural heritage sites 'in the forest' include all other archaeological and historical sites, in which the forest itself is not an important aspect of its heritage value. Such sites often predate the forest, which subsequently grew around it. Examples include: ancient settlements, fortifications, burial mounds, earthworks, field systems and other evidence of historic farming practices, standing stones and military, funerary, industrial and domestic monuments, churchyards, crosses and memorials, battle sites, historic places of assembly or ceremony, castles, bridges, roads and transport structures.

The category 'Forested landscapes with cultural and spiritual values' may also be referred to as 'cultural landscapes' if forest or other wooded land is the primary component. The term encompasses a wide range of manifestations of the interaction between humankind and its natural environment. Such landscapes fall into three main types:

a) landscape designed and created intentionally by humans, often for aesthetic reasons, including historical and contemporary designed forested landscapes;

b) organically evolved landscape, either 'relict' (or fossil), in which an evolutionary process came to an end at some point in the past, or 'continuing', i.e. a landscape that retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress;

c) associative cultural landscape, which is recognised primarily for its religious, artistic or cultural associations with the natural element rather than any material cultural evidence (UNESCO, 2008. Operational Guidelines for the Implementation of the World Heritage Convention, Annex 3).

All three types may be recognised for their contemporary aesthetic, amenity or recreational values. This category includes sites with geological and other non-biological natural elements of recognised cultural and spiritual value, such as mountains and waterfalls.

The category 'Trees with cultural and spiritual values' includes individual veteran trees, heritage trees, champion trees, and trees associated with religious and spiritual practices and beliefs. It also includes groups of trees that are too small to be classed as 'Forested landscapes', such as hedges, avenues and groves. Veteran (or ancient) trees can be defined as trees that are old relative to others of the same species, and are of

interest biologically, aesthetically or culturally because of their age. For example, a birch tree may be considered to be a veteran at 200 years old, while a yew may have to survive for at least 1,000 years before it can be considered ancient. Veteran 'working trees' include those that were coppiced, pollarded, shredded etc, as part of historical management practices. Heritage trees can be defined as trees that are revered for their historical, cultural or botanical significance, for example because they are very old, have interesting historical associations, e.g. 'witness trees' that were present at the scene of notable historic events or 'champion trees' with record dimensions (girth, height, amount of timber, etc).

'Other sites with cultural and spiritual values' include sites of contemporary cultural and spiritual importance, such as venues for cultural performances, ceremonies and gatherings, sites of sculptures and other installation art, and sites of recent woodland burial. Such sites may have historical associations, however they are recorded under this category rather than 'Cultural heritage' if their current use is recognised as more important than their historical use.

Status and trends

This indicator quantifies one aspect of the rich diversity of cultural and spiritual values associated with forests. The number of sites can only provide a rough estimate of their importance to society because of differences in the value likely to be attached to different sites within the same category (some of which may be enjoyed by thousands of visitors each year while others may only be known to a handful of experts) and the subjectivity around the concept of value (which may vary greatly between individuals). Despite these problems, this indicator reinforces the message that cultural and spiritual values must be acknowledged as part of the definition and implementation of sustainable forest management alongside the more tangible functions and services provided by forests.

Overall, 28 countries provided data on at least one category of site. For approximately half of these countries, the most recent available data was around ten years old. In total, around one and a quarter million sites were reported, of which around three-quarters were classified as 'Cultural heritage'. There was considerable variation between countries and regions in the figures provided for each category (Table 73). Sweden recorded the highest total number, including the highest number of both 'Cultural heritage' sites (750,000) and 'Trees with cultural and spiritual values' (150,000). Germany recorded the highest number of 'Other sites' (97,500). The number of forested landscapes in each country ranged from one (Iceland) to around 3,000 (Hungary). On average, for countries that provided data, around 40% of the total number of cultural heritage sites were associated with historical forest management. However, excluding Sweden, the average reported figure was less than 2%.

The data are incomplete for all European regions and should, therefore, be treated with caution. Some countries did not provide any data despite the fact that they are thought to have thousands of sites. There may also be inconsistencies in the ways different countries interpreted the definitions for each category of site. However, the quality of the data has improved since 2007.

Key conclusions and recommendations

This indicator quantifies one aspect of the rich diversity of cultural and spiritual values associated with forests. The number of sites can only provide a rough estimate of their importance to society because of differences in the value likely to be attached to different sites within the same category (some of which may be enjoyed by thousands of visitors each year while others may only be known to a handful of experts) and the subjectivity around the concept of value (which may vary greatly between individuals). Despite these problems, this indicator reinforces the message that cultural and spiritual values must be acknowledged as part of the definition and implementation of sustainable forest management alongside the more tangible functions and services provided by forests.

Table 73. Number of sites by region

Region	Cultural heritage		Forested landscapes	Trees	Other sites
	Total	of which associated with historical forest management forest management			
North Europe	776,737	351,021	753	152,525	4,236
Central-West Europe	108,934	1,102	604	44,498	97,595
Central-East Europe	8,876	222	3,,353	41,021	162
South-West Europe	4	0	203	1,865	0
South-East Europe	8,525	170	545	1,653	48
Europe	903,076	352,515	5,632	241,564	102,041
EU-28	899,321	352,515	5,068	238,600	102,033

Qualitative Indicators

Indicator B8 Economic viability

The main trends in relation to economic viability are stability regarding objectives and financial, legal and informational instruments combined with some institutional arrangements in a few countries

Status, trends and main changes in policy objectives since SoEF 2011

A wide variety of objectives specific to the national contexts have remained unchanged since the last reporting period

27 of 34 signatories reported policy objectives in relation to the economic viability of forests. These are very similar to those reported in SoEF 2011. They are very diverse across Europe as they are directly linked to the national contexts. They include approaches such as the optimisation of the supply chain (Austria), the encouragement of entrepreneurship and professional qualification (Germany, Bulgaria), the optimisation of the structure and size of forest enterprises (Germany, Ukraine), the valuation and marketing of NWFP (Croatia, Czech Republic, Finland, Italy), the promotion of bioenergy use of wood (Italy), and support for improving forest accessibility (Ireland).

Only a few countries (5 of 34) reported changes in the main policy. These were very country-specific and referred to the improved utilisation of EU funds (Bulgaria), the socio-economic activation of forestry (Spain) and guaranteeing the coexistence of new biomass value chains with traditional wood-based industries (United Kingdom).

Almost half of the responding signatories (15 of 34) reported on key measures relating to productive forests (Table 74).

Institutional frameworks

Stability in institutional frameworks in comparison to the last reporting period with only two countries highlighting specific changes

The responsible and implementing organisations are mainly ministries (i.e. Ministries of Economy, Agriculture, Rural Development, Economic Development and Trade, Industry and Trade etc.) and state forest enterprises, however the role of other actors is also recognised (i.e. forest owners). Only two signatories (Belgium and Slovak Republic) reported specific institutional changes in this policy area through the creation of new governmental departments for dealing specifically with the economic aspects of forestry, i.e. the creation of a new economic office (Wallonia/Belgium) and the creation of a new forest management and wood processing section (Slovak Republic) which will ensure the exchange of information on forest management and wood processing issues. In addition, 5 signatory countries reported overall institutional reforms (organisational/administrative) in the agriculture, forest and environmental sectors that also affect this policy area (for more information, see Part I Overall institutional frameworks).

Legal/regulatory framework and international commitments

Amendment of financing aspects lead the few changes reported

Only four signatories have reported significant changes linked specifically to this policy area. These changes are related to financial issues (Montenegro and Poland), the adoption of a new regulation on timber and biomass measurements in support of fair trade relationships within the forest value chains (Sweden), and a new forest law in Galicia (Spain) to improve the economic performance of small forest holdings.

Table 74. Key measures on economic viability

Key measures	Countries
Development and implementation of National Forest Programmes, Action Plans and/or strategic programmes (sometimes at sub-national level)	Austria, Slovenia, Spain
Reform of national forest laws with a new emphasis on competitiveness	Finland
Support of fair trade relationships on the value chain	Sweden
New research programmes/projects	Finland, Romania
Support, including subsidies, under the national rural development programmes, co-financed by the EAFRD	Czech Republic, Hungary, Spain
Improved tax regimes, improved access to funding and/or new grants	France, Slovak Republic, Ireland
Evaluation of ecosystem services	Slovak Republic
Sustained efforts in road construction that are improving accessibility and improvements in energy efficiency	Ukraine

Financial instruments and economic policy

Stability, the major trend in the current reporting period as over 80 % of countries reported no changes

The majority of responding signatories (28 of 34) reported "no significant changes" in financial instruments since 2011.

As was the case previously, state forests in 47% of the reporting signatory countries (16 of 34) are expected to be self-sufficient while they receive additional financial support from governments in the remaining 53%.

Grants and subsidies continue to be the preferred financial instruments for supporting privately owned forests and are used by 65% of the signatory countries. The management objectives associated with those grants are very country specific. They target aspects such as woodland creation (i.e. United Kingdom, Ireland, Iceland, Denmark, Hungary), protective forest maintenance (i.e. Switzerland), the provision of ecosystem services and management in protected areas (i.e. Belgium, Croatia, Norway), and forest protection (Slovak Republic). A reduced tax regime is the second most common financial Instrument used by 44% of the reporting signatories to support private forestry. These tax measures include a simplified flat tax for forest owners (Austria), income tax exemption for wood sales (Ireland), inheritance tax exemption (i.e. United Kingdom, Belgium), tax reduction for forests under certain circumstances (Czech Republic, Denmark, France, Poland, Romania, Spain), tax refunds for certain activities (Iceland, Luxemburg), and other tax advantages (Norway, Sweden).

Other incentives are reported by 26% of the reporting countries. The most common of these is the provision of technical and management support (Bulgaria, Cyprus, Czech Republic, Turkey, Switzerland), however other measures are also used, for example the provision of free seedlings (Cyprus, Montenegro). The use of credit and investment support is marginal as a means of supporting private forest owners.

In the EU countries, most of the above-mentioned instruments are supported through Rural Development Plans and the European Agricultural Fund for Rural Development (EAFRD). In fact, the adaptation of the support instruments to the new Common Agricultural Policy (2014-2020) is reported as the most relevant source of change.

Informational means

Only a minority of countries report changes in relation to informational means associated with the economic viability of forests

Only 4 signatories reported changes in forest communication strategies, means or activities in relation to the economic viability of forests. The United Kingdom, for example, reported one specific example of improved communication in relation to this indicator through the publication (2011 to 2014) of information on different aspects of the economic viability of harvesting, including the distance of timber to roads, ease of access to timber sizes and species etc.

Table 75. Financial Arrangements related to State owned forests. Note that some countries with regionalised forest policy may appear in both categories

Countries were State Forests are expected to be generate profit of be self-sufficient	Bulgaria, Croatia, Finland, German, Hungary, Latvia, Montenegro, Norway, Poland, Romania, Slovenia, Spain, Sweden, Turkey, Ireland
Countries were State Forests receive additional financial support from national budgets	Belgium, Cyprus, Czech Republic, France, Greece, Iceland, Italy, Luxembourg, Portugal, Romania, Slovak Republic, Spain, Switzerland, Turkey, Ukraine, United Kingdom, Denmark

Indicator B9 Employment

Employment remains a crucial area for sustainable forest management and forest policy. Significantly different levels of employment are reported by the states in Europe, mainly dependent on the degree of mechanisation of the forest sector.

Status, trends and main changes in policy objectives since SoEF 2011

Maintaining or increasing employment on the forest sector is a specific objective for half of the countries

According to the national data on employment reported by the Forest Europe signatories, maintaining and/or increasing employment levels in the forest sector are the main forest policy objectives in over the half of the reporting countries (18 of 34) for the years to come. Several countries adopted forest policy objectives that support the more sustainable development of the labour force, including the improvement of working conditions (Croatia, Italy and Slovak Republic) and maintenance of safety and health conditions in the forest sector (Latvia, Sweden and Switzerland). Other countries (Bulgaria, Portugal and United Kingdom) are targeting the improvement of qualifications and professional skills.

Compared to previous SoEF reports, the current data suggest that maintaining and/or increasing the levels of employment in the forest sector have become a priority and have overtaken the quality issues that predominated in 2011 and 2007. The current trend in forest policy objectives is to tackle the decline in employment numbers triggered by the recent financial crises and economic decline, which have had a negative impact on the majority of countries (see Box I).

Box I. Economic decline and employment in the forest sector

Cyprus provides a good example of a particular course of action and strategy to deal with employment-relevant issues arising from the impacts of the recent economic decline from 2008 in Europe. Despite the economic crisis and stagnation, the country decided to not decrease the number of forestry workers employed. Instead, Cyprus attempted to maintain the current level of employment in the forest sector in order to maintain the associated job opportunities in disadvantaged rural areas.

A trend can also be identified among the stated objectives for ensuring "better jobs" in the forest sector. New objectives were reported by a few countries (e.g. new training and education targets in Spain).

Almost half of the signatories have taken key measures on employment since 2011. These range from adopting framework forest policy documents, such as national forest programs, action and strategic plans (e.g. Austria, Finland and Hungary), and specific documents regulating the development and education of the labour force (Bulgaria, Germany). National laws and acts on labour were adopted in some countries (Czech Republic, Poland). A new health and safety regulation was adopted in Turkey in 2014 while the laws on work health and safety conditions were amended in Bulgaria, Croatia and Spain. Rural development programmes, co-financed by the EU, provided financial resources for supporting employment in the forest sector (Czech Republic, Poland and Portugal). Hungary targeted the creation of more jobs through the inclusion of private forestry in public work programmes. Only 6 out of 34 reporting signatories indicated changes in their informational means regarding forest sector employment (Austria, Bulgaria, Finland, Hungary, Slovenia and Spain). For example, Austria focused strategically on the use of the internet and social media to reach a much broader audience, particularly young people. Slovenia is directing its informational efforts at enhancing professional qualifications in the private forest sector with a view to tackling the high rate of work accidents that occur there.

Figure 109 presents an overview of the numbers employed (Full Time Equivalent, FTE) in public forest organisations. As reported by 24 of 34 signatories, a total of 192,852 employees were employed in the public forest sector in the reporting period, which amounts to an average of 8,036 employees per country. Among the reporting signatories, the largest number of employees can be found in Eastern Europe, in particular Ukraine, followed by Turkey, Poland and Romania. France remains the largest employer in Western Europe. These figures show that the trend regarding employment in the forest sector has remained stable since the 2011 SoEF report. There are no data available about Russian Federation, which was the largest employer in the 2011 report.

Some individual countries reported a decrease in the number of employees in the forest sector. For example, public forestry employees decreased in Ukraine due to changes in the institutional frameworks which transferred some forestry operations to external contractors. An overall trend in this direction was already described in the 2011 SoEF report. The decrease in the workforce in Italy was mainly due to the negative impacts of the financial crisis and the country's economic decline. The trend towards job reductions mainly as a result of increased productivity due to higher levels of mechanisation in the forest sector as described in the 2011 report is also confirmed by examples provided by the signatories for the current report. For example, the absolute number of people employed in the public sector in Ukraine is around sixteen times higher than that employed in Sweden, despite the fact that the latter's forest area is almost three times larger than Ukraine's. Mechanisation levels in the forest sector remain predominantly high in the Northern and Central European countries, and comparatively low in Eastern and Southern Europe. These differences among countries and regions could also be explained by other factors such as the varied forest ownership structures (private/public), the need to perform specific tasks (forest-guards, forest fire prevention), and different political cultures and forest governance traditions (market-based vs. state-centred regulations).

Only a few of the signatories reported on key lessons learnt in relation to requirements in the area of forest sector employment. These mainly concern gender equality and early age support for young women (Slovak Republic), and new 'green jobs' which could be created through the further promotion of forest products (Spain).

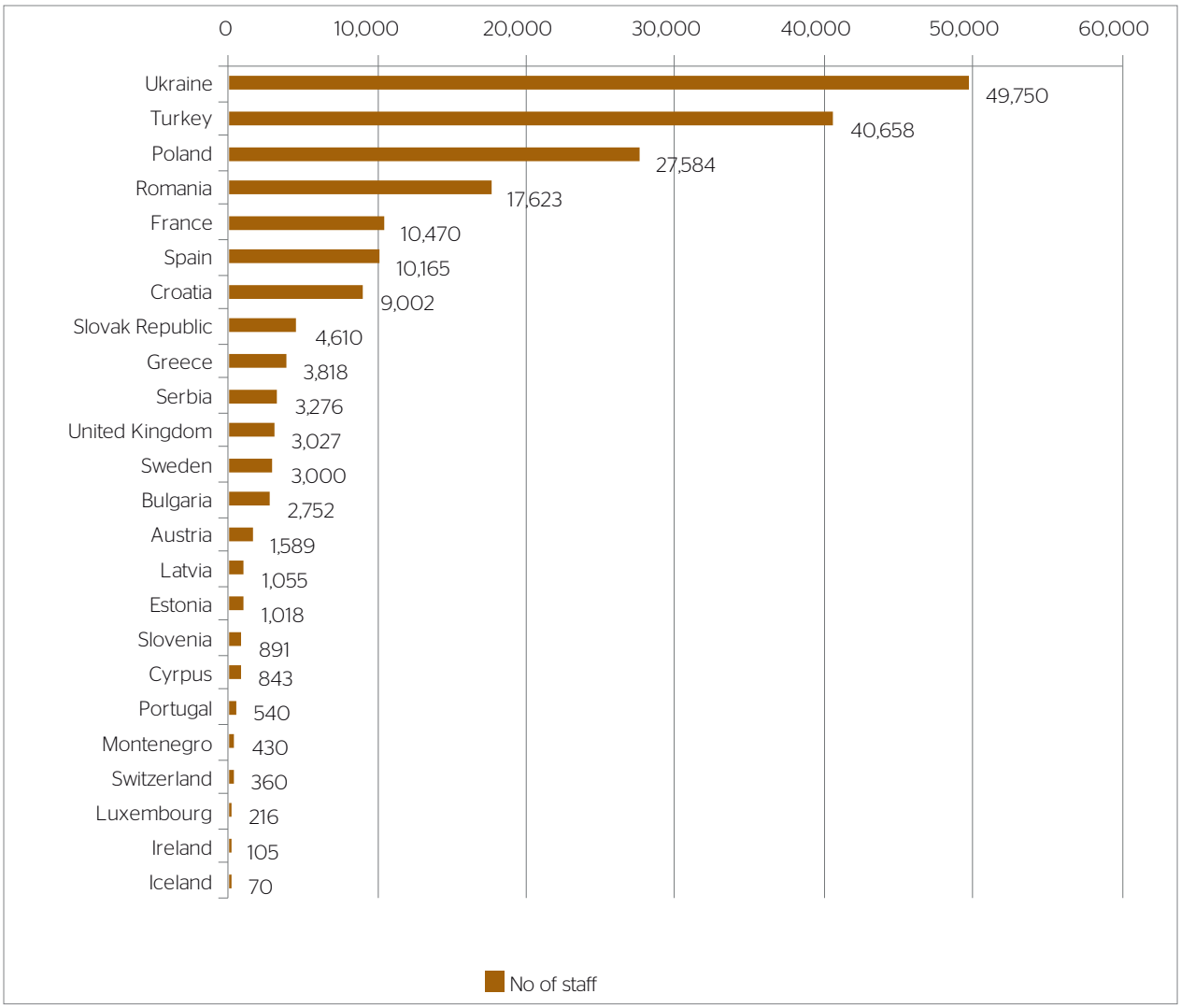


Figure 109. Employment in public organizations related to forests (full time equivalent (FTE) staff)

Institutional frameworks

Continuity of institutional arrangements in the majority of countries compared to the last reporting period

In general, changes in institutional frameworks relate to overall institutional reforms (organisational/administrative) in the environmental/forest sector (for more information, see Part I Overall institutional frameworks).

In the majority of countries the responsible and implementing organisations relating to forest employment are mainly ministries (e.g. Ministries of Employment and Economy, Labour, Agriculture, Rural Development, Environment etc.) and work and labour authorities/inspectorates, regional governments/provinces, forest agencies/departments and enterprises, institutes.

Only 6 countries reported changes in their institutional frameworks, i.e. Bulgaria, Finland, Turkey, Ukraine, United Kingdom and Croatia.

Legal/regulatory framework and international commitments

Only a few changes arose during this reporting period. The reported developments mostly concern the laws governing work health and safety conditions

In many of the FOREST EUROPE countries employment (including health and safety issues) is regulated by general legislation covering labour relations and occupational health and safety and the forest law.

Since 2011, only 6 of 34 reporting signatories specified changes in relation to employment matters in the forest sector. The changes relate to amendments of the laws on work health and safety conditions, as it is the case for Bulgaria, Croatia and a region in Spain.

Financial instruments and economic policy

The new Common Agricultural Policy (CAP) is the main development at EU level for the current reporting period. A large majority of countries reported no changes in this area since 2011

The majority of responding signatories (30 of 34) reported "no changes" and, at EU level, the new Common Agricultural Policy (2014-2020) as the main development of the period.

Informational means

Just few new developments were reported for informational means in relation to employment during this reporting period

Regarding employment, most of the reporting signatories (25 of 34) reported no changes in their use of informational means. However, 5 countries stated some new developments (table 76).

Table 76. Changes on informational means related to employment

Changes in the overall communication forest strategy /informational means that also contribute to employment	Finland, Austria
Establishment of data bases	Bulgary
Communication on further extending the public work programs in the forest sector and inclusion of private forestry to public work programs that creates more jobs in the sector	Hungary
intensification of the activities for improvement of forestry professional skills	Slovenia

B10 Public awareness and participation

Enhancing public and multi-stakeholder participation in forest planning and decision-making processes and raising public awareness of the multi-functional role of forests remain topics of considerable importance across Europe

Status and trends

More countries are aiming to promote and enhance multi-stakeholder public participation in forest planning and decision-making processes

Most of the reporting signatories (25 of 34) reported specifically formulated policy objectives in relation to public participation and awareness. The active and informed participation of communities and stakeholders affected by forest management decisions is critical to the credibility and sustainability of management processes. Reflecting this, and in comparison to 2011, more countries currently aim to promote and enhance public and multi-stakeholder participation in forest planning and decision-making processes. The United Kingdom, for example, has been strengthening its commitment to encouraging community participation in forest management and community ownership of forests while Slovenia aims to increase awareness among forest owners and the public and actively involve them in forest management planning processes. In addition, two countries (Austria, Slovak Republic) emphasised the importance of recognising interests, and highlighted the need to strengthen collaboration and cooperation between forest and forest-related governmental and non-governmental authorities and organisations. Bulgaria and Romania specified increasing transparency and accountability in forest management and decision-making processes as a principle of good forest governance.

Public awareness-raising and communication activities play a critical role in informing and educating the public, thereby allowing it to participate more effectively in SFM decision-making. For nearly one third of the reporting countries, the main overall objective is to enhance public awareness about forest protection and conservation and increase understanding of the multifunctional role of forests. A few countries explicitly highlighted the need to raise awareness about forest fires (Spain, Romania), the benefits of forests to human well-being and health (Iceland, Spain), and the contribution of forests to renewable energy sources (Germany). 5 countries (Austria, Czech Republic, Hungary, Montenegro, Ukraine) emphasized the need to improve communication and the exchange of information on sustainable forest management.

Although most signatories reported "no changes" since 2011 (23 of 34), a few countries specified the inclusion of new and more specific policy objectives in relation to:

- public consultation and participation as a means of attaining more inclusive policy formulation and implementation (Cyprus)
- new educational programmes in order to enhance understanding of the multiple benefits forests provide to society (Spain)
- community ownership and leasing of forests, particularly in state forests (United Kingdom)

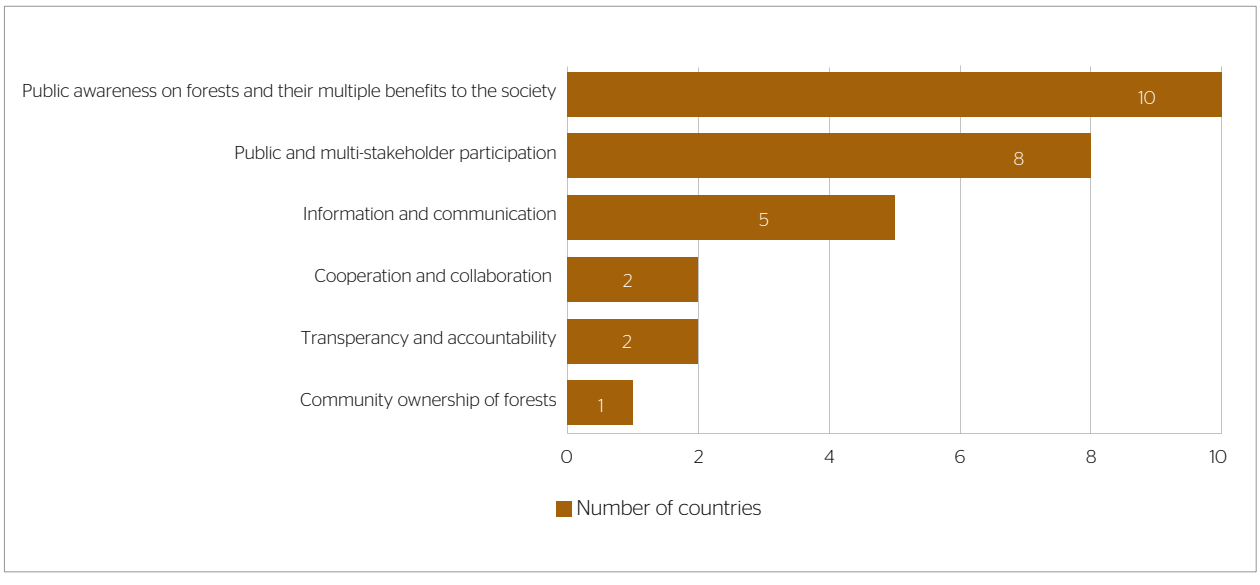


Figure 110. Issues considered in main policy objectives relating to public awareness and participation for the period 2011-2014

Over half of the reporting (17 of 32) signatories reported that key measures have been taken on public awareness and participation. The most frequently reported key measures are public events and campaigns, for example in the context of the International Year/Day/Week of Forests (Czech Republic, France, Germany, Norway, Slovenia, Romania), the use of information tools, portals and websites (Finland, Italy, Poland, Turkey, Slovenia), forest publications and magazines (Germany, Italy, Poland), and educational programmes and projects (Spain, Finland, Norway). The implementation of national forest programmes, action (regional) plans, and communication strategies (Austria, Bulgaria) was also reported.

Box II. An innovative communication tool for the public on multipurpose forest management in Slovenia

The Slovenia Forest Service (SFS) has developed an SFS Viewer, which is a web-based GIS application that provides a link between the knowledge stored in the forest information system and the stakeholders. It enables forest owners and the public to view and search for information on the state of Slovenia's forests. It also enables the identification of priority areas for the use of non-wood goods and services, such as chestnut picking, water, recreation areas and others, and searches for forest functions or forest categories (e.g. protective forests, forest reserves). Users have access to textual elements of forest management plans, hunting plans and regional forest plans.

Institutional framework

No major changes reported in relation to institutional framework

With regard to institutional frameworks, most signatories (24 of 34) reported no significant changes since 2011. Only 2 countries referred to specific institutional developments in relation to public awareness and participation. Cyprus reported on the establishment of a new Botanical Garden and a third Visitor and Educational Centre by the Department of Forests. Ukraine highlighted the formation of a new Public Council as an advisory body to the State Forest Agency.

Legal/regulatory framework and international commitments

Forest law continues to provide the main legal and operational basis for public awareness and participation

In many countries, the forest law is the main legal and operational basis for public awareness and participation. Although the majority of reporting signatories reported no changes in their main reference document, 3 countries specified public hearings and consultations (incl. private forest owners associations) as part of the procedure for developing and adopting new forest management plans (Bulgaria, Montenegro, Ukraine).

Financial instruments and economic policy

The majority of reporting signatories (31 of 34) reported "no changes" in relation to financial instruments and economic policy directly linked to this indicator

Informational means

More informational means and broader targets compared to the 2011 report

According to the data submitted by the 34 reporting signatories, the most common awareness-raising instruments are self-explanatory information initiatives, sometimes used in combination with economic instruments (e.g. subsidies and incentives). The most frequently used informational and educational means are publications, flyers, brochures, films, websites, annual reports and statistical publications, information and media campaigns, forest events (also for children in schools) and exhibitions, etc. Compared to 2011, there is growing recognition of the importance of better communication on forest issues to create a broader outreach, in particular to young people, forest owners, communities and the forestry sector. Although the majority of countries (24 of 34) reported no changes, a few countries highlighted the increased use of social media (Austria), awareness-raising within the main target groups (Bulgaria), and the development of cost-free herbaria for pedagogical and educational purposes (Luxembourg).

Indicator B11 Research, training and education

Enhancing research activities, cross-sectoral cooperation, innovation and technological development, and improving the quality and efficiency of forest education and training at all levels are gaining in significance

Status, trends and main changes in policy objectives since SoEF 2011

Half of the countries reported on the further promotion and strengthening of research activities as an specific objective for the period

Most signatories (26 of 34) reported specifically formulated objectives in relation to research, training and education. As was the case in 2010, many countries[7] (17 of 34) explicitly highlighted the further promotion and intensification of research activities, particularly in relation to the competitiveness of the forest sector, ecosystem monitoring, forest and climate change, sustainable forest management, close-to-nature forest management, and forest-related ecological, technological, and social issues. Compared to the 2011 report, a slight trend towards greater emphasis on cross-sector research, technological development, innovation and knowledge management can be observed. Several countries currently aim to improve the international transfer of knowledge and technology relating to sustainable forest management (Austria), technological developments relating to the competitiveness of the forest sector (Czech Republic, Slovak Republic), the streamlining of forest-related research and scientific innovation (Romania, United Kingdom), and integration of cross-sectoral disciplines such as agriculture, fisheries, natural resources (Finland, Hungary, Slovenia).

With regard to education and training, the situation remains similar to the previous reporting period. Having acknowledged that a competent workforce is a central factor for success in the forest sector, most countries continuously aim to improve the quality and efficiency of forest education and training based on the specific needs of the forest sector in order to ensure competiveness and dynamic development (Cyprus, Finland, Slovak Republic, Ireland, Latvia, Montenegro, Poland, Sweden, United Kingdom). In addition, 2 countries (Sweden, Finland) reported specific objectives focused on maintaining and/or further increasing the number of graduates, particularly female and at all educational levels, into the areas of forest, bio-energy, wood, and the paper industry. Hungary currently aims to integrate human resources management, decision-making, marketing and public relations into forest education.

Similar to 2011, over half of the responding signatories (23 of 34) indicated "no changes" in their policy objectives with respect to research, training and education. However, 5 countries (Bulgaria, Cyprus, Iceland, Spain and United Kingdom) reported on the formulation and adoption of new or more specific policy objectives focusing on, e.g.:

- enhancing the qualification and re-qualification of the working force in the forestry sector (Bulgaria)
- developing of new forest information blocks within the social security information system and creation of a register of cooperatives, industries and forest companies (Spain)
- ensuring the continuing flow of a trained workforce, at both forest floor and professional forester levels (United Kingdom)

Nearly half of the reporting signatories (16 of 34) reported on the implementation of key measures to further promote and enhance forest research, training and education. Most countries referred to education/training programmes and research projects (Bulgaria, Cyprus, Finland, Italy, Norway, Poland, Portugal, Slovenia, Ukraine) coordinated by research institutes, universities or colleges. In this context, several EU Member States underlined the role of the EU Framework Programme for Research and Innovation Horizon 2020 in defining research priorities and funding research (see financial instruments). In addition, Spain specified the Plan for the Activation of the Spanish Forest Sector (PASSFOR), which includes a set of measures for promoting and encouraging research and development on the integrated management of forest holdings and forest areas.

Box III. Target research programmes in Slovenia

In 2011 and 2014, the Ministry for Agriculture and environment (responsible for forestry) launched the Target research programmes, which represent a system created in 2001 for inter-sectoral cooperation in planning and implementing networked R&D projects for specific areas of public interest. They represent a special form of scientific and research programme with which the Ministry for Higher Education, Science and Technology intends to contribute to setting and implementing strategic development objectives for Slovenia in cooperation with other ministries and other interested users, in order to improve Slovenia's competitive capacity.

[7] Austria, Bulgaria, Belgium, Cyprus, Czech Republic, Finland, Germany, Hungary, Iceland, Latvia, Poland, Romania, Slovak Republic, Slovenia, Turkey, Ukraine, United Kingdom

Only 2 countries provided information on key lessons learned in relation to research, training and education. Poland underlined the lack of financial resources hampering the sectoral research and the development of a "career counselling system in the forest sector". Germany emphasised the five-year university education, which appeared to be more beneficial to students than the new three-year Bachelor years study followed by a two year Master one.

Institutional frameworks

No institutional changes for most of the countries; some changes in reorganisation seeking the implementation of cross-sectoral approaches in research

As in 2011, most signatories (21 out of 34) reported no changes in their institutional frameworks in relation to research, training and education. However, administrative and/or organisational changes took place between the period 2011-2014 in 7 countries (Belgium, Cyprus, Finland, Hungary, Slovak Republic, Ukraine, United Kingdom). Although most of the changes relate to the overall institutional reforms in the environmental/forest sector (see A2 Institutional Frameworks), a few countries reported specific changes, particularly in relation to bringing together cross-sectoral expertise, e.g. research in natural resources (Finland) and agriculture, forestry and fisheries (Hungary).

Box IV. Bringing together research on natural resources in Finland

The new Natural Resources Institute Finland (Luke) brings together cross-disciplinary expertise in the areas of forest, the agriculture and food industries, and game and fisheries in Finland. The Institute comprises the state research institutes: MTT Agrifood Research Finland, the Finnish Forest Research Institute, the Finnish Game and Fisheries Research Institute, and the statistical services of the Information Centre of the Ministry of Agriculture and Forestry.

The overriding goal of the research institute is to promote competitive business activities based on the sustainable use of renewable natural resources, well-being, and the vitality of rural areas. Furthermore, it aims to support social decision-making and produces statistics on food, renewable natural resources, the genetic diversity of crops, livestock and forest trees.

Legal/regulatory frameworks and international commitments

Forest law continues to provide the main legal reference in relation to forest research, training and education

In many countries, research, training and education policies are based on forest laws, the general legislation on training and education, or specific forest-related research, training, education policies. Since 2011, only 4 countries reported that they had amended the main legal reference documents or adopted new specific regulations or policies in relation to research, training and education. For example, a new Framework Convention for Forest Research 2014-2019 (Belgium) and a new Act on Natural Resources Statistics and a development plan for research and education (Finland) were adopted. In Bulgaria, the main laws and ordinances relating to education as a whole have been frequently changed with no impact on the forest sector. However, a new chapter on education, qualification and re-qualification of the employees in the forest sector was introduced. In February 2012, work commenced on the development of a new national forest research strategy in Ireland. The strategy, which is called Forest Research Ireland (FARI), was launched in October 2014 following extensive stakeholder involvement and public consultation. It will guide the content of the Competitive Forestry Research for Development Programme (CoFoRD Programme) up to 2017.

Financial instruments and economic policy

EU programmes are attracting the interest of the countries as financial instruments for research

The majority of reporting signatories (28 of 34) reported no significant changes in relation to financial instruments and economic policy since 2011. Nevertheless, 2 countries have increased allocations from state budget for research institutes, i.e. the Central-East and South-East European Regional Office of the European Forest Institute (Croatia), and the training and education of the employees of the Executive Forest Agency (Bulgaria). In addition, a few EU Member States also reported on the mobilisation of EU funds through the European Agricultural Fund for Rural Development (EUAFRD), LIFE +, the EU Framework Programme for Research and Innovation Horizon 2020, and the European Innovation Partnerships (EIP).

Informational instruments

Just few developments were reported in relation to information instruments since 2011

While the majority of signatories (27 of 34) have reported no changes, a few countries referred to specific training and education projects and programmes (Bulgaria, Croatia), and changes to the overall informational means/forest communication strategy in their countries (Finland, Austria).

Indicator B12 Cultural and spiritual values

The increasing acknowledgement and recognition of cultural or spiritual values in forests and woodlands provides additional reasons for their conservation in many European countries.

Status, trends and main changes in policy objectives since SoEF 2011

Key measures vary to a great extent across Europe due to adaptation to specific national conditions

Regarding policy objectives, around 70% of countries reported "no changes". Only 4 signatories reported positive changes, e.g. a systematic vision, strategic goals, priorities and activities which will lead to sustainable schemes for the development and management of tourism activities (Bulgaria); clearly defined objectives (Cyprus); new Monumental Trees Protection Act (Portugal); and boosting the social use of forest areas by promoting rural tourism, natural green paths and other cultural elements (Spain). However, the absence of changes does not necessarily imply a low level of interest if the country already has appropriate policies in place as is the case, for example, in Norway.

Regarding key measures adopted, almost 30% of countries reported on diverse measures in relation to cultural and spiritual values, e.g. national forest programmes and strategies in Austria and Bulgaria; national laws, funding and educational programmes in the Czech Republic; inventories of cultural heritage sites in Finland and Estonia; the creation of an 'exceptional forest' label for public forests of special cultural interest in France; the publication of information about the cultural heritage in the forest in Iceland; and forest management plans in Norway and Slovenia. Estonia deserves special recognition as it was the first European country to approve a plan for the study and conservation of sacred forest sites with its Sacred Natural Sites Estonia Plan (2008-2012), which refers to pre-Christian sacred groves (hiis), trees and forests, some of which are still used by the followers of the country's ancient spiritual tradition (Maausk). Only Spain mentioned key lessons learnt, i.e. the development of a wide network of natural paths offers a great opportunity for improving the recreational use of forests, which now have better access thanks to the natural paths.

Table 77. Examples of key measures adopted in relation to cultural and spiritual values

Bulgaria	The National Strategy for sustainable development of tourism in the Republic of Bulgaria (2014-2030) will endorse sustainable schemes for tourismactivities in forestlands, more specifically in relation to eco- and hunting tourism.
Cyprus	For the first time, there is a clearly defined objective for cultural and spiritual values in the Forest Policy Statement.
Czech Republic	Law and respective decrees of particular state bodies. Funding of programmes for the restoration of forest and natural monuments restoration, awareness-raising through the education of the public using programmes like "forest pedagogy".
Estonia	In 2008, the Estonian Ministry of Culture approved a plan on Sacred Natural Sites Estonia: Study and Conservation 2008-2012, which refers basically to pre-Christian sacred groves (hiis), some of which are still used by the followers of the country's ancient spiritual tradition (Maausk). This is plan constitutes a first for European and has identified tens of sacred trees, groves and forests.
Finland	Metsähallitus is compiling an inventory of the cultural heritage of state-owned forests in Finland. The inventory will be completed in the autumn 2015.
France	Creation of a "Forêts d'Exception" label for public forests of special cultural or spiritual heritage interest.
Hungary	Regulation on the establishment of forest welfare facilities within rural development measures.
Luxembourg	Publication about the cultural heritage present in the forest.
Romania	Regardless of the legal nature of ownership (public or private), forest management plans define historic sites, monuments of culture, forests established as nature reserves and landscape reserves, forests that protect natural monuments, ancient forests, pristine and near pristine forests of great value as protected forests of important cultural and spiritual value. Designation is based on the functional zoning of forests developed in the Technical Norms for Management Planning, which must be observed in the development of forest management plans. Forest management plans, which underlie functional zoning, include specific provisions for the forests assigned with such protective functions.
Slovak Republic	Some new "Important forestry sites"have been designated.
Slovenia	Sites of cultural and spiritual values in the forest are mapped in the forest management plans, providing guidelines that are coordinated between the responsible institutions.
Spain	Initiatives have been launched by a number of Regional Governments to promote traditional agro-forestry landscapes.
Ukraine	The number of natural monuments preserved in Ukrainian forests increased by 4.3% since 2011.
United Kingdom	Actions to encourage greater awareness of forestry and its history led to initiatives for the promotion of a "woodland culture".

Institutional frameworks

Ministries continue to act as implementing organisations, however, other actors, for example state forest authorities and institutes for cultural values,also play an important role in some countries

Changes in institutional frameworks generally relate to overall institutional reforms (organisational/administrative) in the environmental/forest sector (for more information, see text on Overall institutional frameworks).

The actors mainly responsible and the implementing organisations in relation to cultural and spiritual values of forests are ministries (e.g. Ministry of Culture, of Education and Science, of Agriculture, of Environment, of Economic Development and Trade, of Natural Resources etc.), regional governments, state forest authorities/inspectorates of cultural monuments, institutes for cultural values etc.

Only 3 out of 32 signatories reported changes in their institutional frameworks: i.e. Finland, Spain, United Kingdom. Of these, the changes in Spain alone were specifically related to this indicator and carried out by regional government. The measure in question involved a manual promoted by an NGO, EUROPARC-Spain, which provides guidance on the integration of cultural and spiritual values into protected areas.

Legal/regulatory framework and international commitments

6 countries reported developments in relation to specific regulations on cultural and spiritual values in forests.

Regarding legal changes, the main basis for cultural and spiritual values is the general cultural and natural heritage legislation, forest law or other nature conservation laws/acts. 7 states reported that they have adopted or amended specific regulations on cultural and/or spiritual values in forestlands since 2011: Bulgaria, Czech Republic, Cyprus, Hungary, Ireland, Latvia and Sweden. For example, Sweden's Cultural Heritage Act of 2014 provides rather strict protection to cultural heritage sites in forests and Cyprus current Forest Policy Statement states the objectives of identifying, mapping and classifying all sites of cultural interest in forestlands with a view to their protection.

Financial instruments, economic policy and informational means

Continuity in financial and informational means as a main trend for the period; few developments in informational means

Most countries reported no changes in the overall financial instruments and economic policy contributing to cultural and spirituals values since 2011.

Regarding information instruments, 5 countries reported positive developments in relation to cultural and spiritual values, e.g. Nature Parks and information centres for visitors (Bulgaria), new publications (Luxembourg), more cultural events and programmes with forest school programmes (Hungary), and the new "Forêts d'Exception" label, a concerted approach for outstanding heritage forests in France. The remaining 26 countries reported no changes since 2011.

Box V. Spain: A handbook providing guidance on the integration of cultural and spiritual values into protected areas was produced in 2012

In 2012, the Spanish Section of the EUROPARC Federation launched a publication entitled "*Patrimonio inmaterial: valoresculturales y espirituales. Manual para su incorporación en las áreas protegidas*" ("Intangible Heritage: Cultural and Spiritual Values. A manual for its incorporation into Protected Areas"), the first manual to be issued in Europe on intangible heritage in protected natural areas. The publication includes contributions from over 40 experts from planning and management bodies for natural areas associated with 12 Spanish regions, the Spanish government and various NGOs. Protected areas cover 13% of Spanish territory and most of them are forestlands.

The manual presents the background to the question at international and European levels, sets out the criteria and methodologies needed for addressing the study and diagnosis of intangible heritage in relation to natural heritage and its values, and provides numerous recommendations for incorporating these values into all stages of protected natural areas, i.e. from declaration and definition to management and evaluation. It includes ten case studies, references, a glossary and a list of over one hundred initiatives and cases relating to intangible heritage that have been developed in Spain.

The full text (in Spanish) can be downloaded at: http://www.redeuroparc.org/img/publicaciones/manual10.pdf

Bibliography

Alberdi, I, Michalak R, Fischer C, Gasparini P, Brändli U-B, Tomter SM, Kuliesis A, Snorrason A, Redmond J, Hernández L, Cañellas I, Lanz A, Vidondo A, Stoyanov N, Stoyanova M, Vestman M, Barreiro S, Claude Vidal. A common FAWS definition is of major importance for the results of any simulation of the European Forest projections. Annals of Forest Science. Submitted.

Berg, A., Ehnstro¨m, B., Gustafsson, L., Hallingback, T., Jonsell, M., Weslien, J., 1994.Threatened plant, animal, and fungus species in Swedish forests: distributionand habitat associations. Conservation Biology 8, 718–731. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

EEA (European Environment Agency), 2006. European forest types – Categories and types for sustainable forest management reporting and policy. EEA Technical Report No. 9/2006. EEA, Copenhagen.

EEA (European Environment Agency), 2008. European forests - ecosystem conditions and sustainable use. EEA Report number 3/2008. EEA, Copenhagen.

EEA 2008. European forest – ecosystem conditions and sustainable use. EEA Report No 3/2008. European Environment Agency, Copenhagen, Denmark

Estreguil, C., Caudullo G., de Rigo D. 2013. A proposal for an integrated modelling framework to characterise habitat pattern, Environmental Modelling & Software (2013), http://dx.doi.org/10.1016/j.envsoft.2013.10.011

Estreguil, C., Caudullo G., de Rigo D. and San-Miguel-Ayanz J. 2012. Forest landscape in Europe: Pattern, Fragmentation and Connectivity. JRC scientific and policy report EUR 25717EN – http://dx.doi.org/10.2788/77842. Luxembourg: Publications Office of the European Union

FAO. 2014. Contribution of the forestry sector to national economies, 1990-2011, by A. Lebedys and Y. Li. Forest Finance Working Paper FSFM/ACC/09. FAO, Rome.

FOREST EUROPE, UNECE and FAO 2011. State of Europe's Forests 2011. Europe's Status & Trends in Sustainable Forest Management in Europe.

FRA 2010. Food and Agriculture Organization of the United Nations Global Forest Resources Assessment 2010 FAO Forestry Paper 163 (FAO, 2010).

Franc, N., 2007. Standing or downed dead trees—does it matter for saproxylicbeetles in temperate oak-rich forest? Canadian Journal of Forest Research37, 2494–2507. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Grove, S.J., 2002. Saproxylic insect ecology and the sustainable management offorests. Annual Review of Ecology and Systematics 33, 1–23. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Harmon, M.E., Franklin, J.F., Swanson, F.J., Sollins, P., Gregory, S.V., Lattin, J.D.,Anderson, N.H., Cline, S.P., Aumen, N.G., Sedell, J.R., Lienkaemper, G.W., Cromack,K., Cummins, K.W., 1986. Ecology of coarse woody debris in temperateecosystems. Advances in Ecological Research 15, 133–302. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Heilmann-Clausen, J., Christensen, M., 2004. Does size matter? On the importanceof various dead wood fractions for fungal diversity in Danish beech forests.Forest Ecology and Management 201, 105–117. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Jonsell, M., Hansson, J., Wedmo, L., 2007. Diversity of saproxylic beetle species inlogging residues in Sweden - Comparisons between tree species and diameters.Biological Conservation 138, 89–99. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Larsson, T-B, Svensson L, Angelstam P, Balent G, Barbati A, Bijlsma R-J, Boncina A, Bradshaw R, Bücking W, Ciancio O, Corona P, Diaci J, Dias S, Ellenberg H, Fernandes FM, Fernandez-Gonzalez F, Ferris R, Frank G, Møller PF, Giller PS, Gustafsson L, Halbritter K, Hall S, Hansson L, Innes J, Jactel H, KeannelDoppertin M, Klein M, Marchetti M, Mohren F, Niemelä P, O'Halloran J, Rametsteiner E, Rego F, Scheidegger C, Scotti R, Sjöberg K, Spanos I, Spanos K, Standovár T, Tømmerås Å, Trakolis D, Uuttera J, Walsh PM, Vandekerkhove K, Watt AD, Van den Meersschaut D. 2001. Biodiversity evaluation tools for European forests. Ecological Bulletin number 50.

Siitonen, J., 2001. Forest management, coarse woody debris and saproxylicorganisms: Fennoscandian boreal forests as an example. Ecological Bulletins49, 11–41. In: Verkerk et al. (2011) Assessing impacts of intensified biomass removal on deadwood in European forests. Ecological Indicators 11 (2011) 27–35

Siry, J.P, Cubbage, F.W & Newman, D.H. 2009: Global Forest Ownership: Implications for Forest Production, Management and Protection. In: Proceedings of the XIII World Forestry Congress (18-23 Oct. 2009), Buenos Aires, Argentina.

Siry, J.P, Cubbage, F.W & Newman, D.H. 2009: Global Forest Ownership: Implications for Forest Production, Management and Protection. In: Proceedings of the XIII World Forestry Congress (18-23 Oct. 2009), Buenos Aires, Argentina.

UNECE Forest Products Annual Market Review 2010–2011).

Vantomme, P., 2003: What are 'Non-Wood Forest Products' for FAO?,International Forestry Review 5(2): 162

Acknowledgements

This fourth, 2015 edition of the State of Europe's Forests report is the product of the concerted efforts of a huge number of National Correspondents, national experts, (see Annexes 5 and 6), authors and reviewers (see Annex 7). We would also like to express our gratitude to those involved in the compilation of the national inventories; their efforts made possible to obtain the data required to provide detailed information about pan-European forests since the first edition of the "State of Europe's Forest" report (SoEF).

The following main tasks and experts were involved in the compilation of the "State of Europe's Forests 2015".

Coordination and guidance

The report was coordinated and compiled by Myriàm Martín Vallejo at FOREST EUROPE's Liaison Unit Madrid (LUM). The entire process was guided by the Advisory Group on the compilation of the State of Europe's Forests 2015 (see Annex 1). The latter's guidance and in-depth knowledge proved invaluable enabling the fulfilment of the wide-ranging tasks involved in the production ofthe final document.

Development of the questionnaires

The collection of information on **quantitative indicators** was split into two parts.

The first one comprised information on the 28 indicators that will be reported or verified by the National Correspondents through the FOREST EUROPE/ UNECE/FAO Questionnaire on quantitative indicators. That Questionnaire was developed and launched by the Forestry and Timber Section of the United Nations Economic Commission for Europe (UNECE)/Food and Agriculture Organization (FAO). This task was led by Roman Michalak and supported by the UNECE/FAO Team of Specialists on Monitoring Sustainable Forest Management. We would like to acknowledge the contribution of the team's leaders, Kari Korhonen and Stein Tomter, during this reporting cycle. Specific input was provided by (in alphabetical order): Simon Gillam, Johannes Hangler, Orjan Jonsson, Kari Korhonen, Andrius Kuliesis, Jan Oldenburger, Jari Parviainen, Kit Prins, Andreas Schuck, Stein Tomter and Alexander Kretov. In order to facilitate and reduce the reporting burden the questionnaire was partially pre-filled.

The second one and for the first time, the 2015 edition of the State of Europe's Forests was produced simultaneously to the Global Forest Resources Assessment (FRA 2015). A joint data collection process involving the FAO's FRA 2015 and other regional processes (Montréal Process, the International Tropical Timber Organization, the Observatoire des Forêts de l'Afrique Centrale and the UNECE/FAO Forestry and Timber Section) was developed with a view to enhancing the quality and harmonization of the data collection and reporting. The result of this process was the Collaborative Forest Resources Questionnaire (CFRQ), which was led by Kenneth MacDicken (FAO) The CFRQ was included in the "Forest Data Reporting Package for 2015", which was distributed by the FAO.

Related to the **qualitative indicators**, the LUM developed an improved questionnaire on Qualitative Indicators compared to the 2011 version by learning from previous experience in accordance with the recommendations and suggestions made by the Advisory Group on the preparation of the State of Europe's Forest 2015, and working in close collaboration with FAO and the European Forest Institute (EFI). The aim was to reduce the reporting burden on the countries and increase the comprehensibility and readability of the questionnaire. This process was led by Ewald Rametsteiner and Glòria Domínguez. Tanya Baycheva-Merger also provided significant input into the structure of the survey and summarised the information provided by the countries. Tanya Baycheva-Merger and Metodi Sotirov (UNIQUE forestry and Land use) were responsible for the analysis of an enormous volume of information.

Data collection

The most part of the information fulfilling the above mentioned questionnaires was provided by the National Correspondents and the national experts. Our gratitude to all of them

The information for the remaining 7 Quantitative Indicators was provided by the State of Europe's Forests 2015 International Data Providers (IDPs) listed in Annex 2. These included Csaba Mozes and Marilise Wolf-Crowther (Eurostat), Alexander McCusker (UNECE/FAO) and Arvydas Lebedys and Yanshu Li from FAO's Forest Economics and Statistics Team. Valuable information was also provided by Michael Köhl and Walter Seidling from the International Cooperative Programme on Forests under the ECE Convention on Long-Range Transboundary Air Pollution (ICP Forests). Important data were also contributed by Bioversity International (see Annex 7, List of Authors) and Jesús San-Miguel from the Institute for Environment and Sustainability (JRC-IES) of the European Commission Joint Research Centre at Ispra (see also Annex 7, List of Authors).

Data review, compilation and analysis

For the Quantitative Indicators,the UNECE/FAO Forestry and Timber Section "State of Europe's Forests 2015 collected and reviewed the National Reports with the close support of a team of experts consisting of Karl Duvemo, Alexander Kretov, Andrius Kuliesis, Ivana Pesut, Stein Tomter and Mati Valgepea.

The LUM was responsible for collecting the National Reports on the pan-European Qualitative Indicators. The associated review and analysis process was carried out by Tanya Baycheva-Merger and Metodi Sotirov.

Writing and reviewing processes

A team of 60 authors drafted the current report. The team was led by Michael Köhl, Jesús San-Miguel Ayanz, Ewald Rametsteiner and Glòria Domínguez, who ensured the internal consistency of each part of the SoEF2015. The team of reviewers consisted of (in alphabetical order): Andy Moffat, Jan Oldenburger, Hans Verkerk, Gerhard Weiss, Christoph Wildburger and Andreas Zingg. The complete list of authors, lead authors, coordinating lead authors and reviewers is provided in Annex 7.

Editing and on-line tools

Ready Translations provided an important contribution by editing the entire report.

Gdos Internet collaboration on the design and development of the on-line pan-European Qualitative Indicators Questionnaire and the associated tools was invaluable.

Special thanks

The European Forest Institute played a substantive role in the compilation of this report. The Natural Resources Institute Finland (LUKE) made the services of Jari Parviainen, Markus Lier and Kari Korhonen available for the process.

We would like to express our sincere gratitude to all of the organizations, institutions and governments who supported the contributions of the vast number of national correspondents, experts and authors involvedin the compilation of this report.

We particularly acknowledge the contribution in kind of the German government, which facilitated the very valuable work carried out by Michael Köhl.

María Tourné Whyte
Head of the Liaison Unit Madrid

Acronyms and Abbreviations

-	data not available	**EUR**	euro
BA	Bosnia and Herzegovina	**EUREKA**	European Research Coordination Agency
Bioversity Int.	International Plant Genetic Resources Institute	**EUROSTAT**	Statistical Office of the European Communities
C	carbon	**EUSTAFOR**	European State Forest Association
CFRQ	Collaborative Forest Resources Questionnaire	**FAO**	Food and Agriculture Organization of the United Nations
CO2	carbon dioxide	**FAOSTAT**	Food and Agriculture Organization of the United Nations Statistics Department
CBD	Convention on Biological Diversity	**FAWS**	Forest available for wood supply
CEC	Cation Exchange Capacity	**FLEGT**	Forest Law Enforcement, Governance and Trade
CEEC	Central and Eastern European countries	**FMU**	Forest management unit
CEI-Bois	European Confederation of Woodworking Industries	**FOPER**	EFI Forest Policy and Economics Education and Research programme
CEPF	Confederation of European Forest Owners (Confédération Européenne des Propriétaires Forestiers)	**FOWL**	Forest and other wooded land
CEPI	European Confederation of Paper Industries	**FRA**	Global Forest Resource Assessment (FAO)
C&I	Criteria and Indicators	**FSC**	Forest Stewardship Council
CIS	Commonwealth of Independent States	**FSCC/ICP**	International Cooperative Programme Forests Soil Coordinating Centre
CITES	Convention in International Trade in Endangered Species of Wild Fauna and Flora	**FTE**	Full-time equivalent
CLC	CORINE Land Cover	**FTEI**	Forestry Training and Education Ireland
C/N ratio	carbon-to-nitrogen concentration	**FTP**	European Forest-Based Sector Technology Platform
COP	Conference of Parties	**FYROM**	The Former Yugoslav Republic of Macedonia
CORINE	Coordinated Information on the European Environment	**GDF**	Directorate General of Forestry
COST	European Cooperation in Science and Technology	**GDP**	Gross Domestic Product
DG	Directorate General	**GHG**	Greenhouse gas
EAFRD	European Agricultural Fund for Rural Development	**GIS**	Geographic Information System
EC	European Commission	**GMES**	Global Monitoring for Environment & Security ha hectare
ECE	Economic Commission for Europe	**ICP**	Forests International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests
EEA	European Environmental Agency	**IDP**	International data provider
EFA	Executive Forest Agency	**IEA**	International Energy Agency
EFDAC	Establishment of a European Forest Data Centre	**IFF**	Intergovernmental Forum on Forests Acronyms and abbreviations
EFFIS	European Forest Fire Information System	**ILO**	International Labour Organization
EFI	European Forest Institute	**INBO**	Research Institute for Nature and Forest (Instituut voor Natuur- en Bosonderzoek)
EFSOS	European Forest Sector Outlook Study	**IPCC**	Intergovernmental Panel on Climate Change
EFTA	European Free Trade Association	**IPF**	Intergovernmental Panel on Forests
EHS	National Ecological Network (Ecologische Hoofdstructuur)	**IPGRI**	International Plant Genetic Resources Institute
EIA	Environmental Impact Assessment	**INIBAP**	International Network for Improvement of Banana and Plantain
EMEP	International Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe	**ISIC**	International Standard Industrial Classification of all Economic Activities

ENA-FLEG	Europe and North Asia Forest Law Enforcement and Governance	**ITTA**	International Tropical Timber Agreement
EQ	Wood equivalents	**IUCN**	International Union for Conservation of Nature
ESF	European Social Fund	**IUSS**	International Union of Soil Sciences
EU	European Union	**JRC**	European Commission – Joint Research Centre
EUFGIS	European Information System on Forest Genetic Resources	**JWEE**	Joint Wood Energy Enquiry
EUFORGEN	European Forest Genetic Resources Programme	**LULUCF**	Land Use, Land Use Change and Forestry
LUM	FOREST EUROPE Liaison Unit Madrid	**REDD**	Reducing Emissions from Deforestation and Degradation
MCPFE	Former brandname of Ministerial Conference on the Protection of Forests in Europe, now FOREST EUROPE	**REFORGEN**	FAO global information system on forest genetic resources
m^3	cubic metre	**SFC**	Shaping Forest Communication
MD	Republic of Moldova	**SFE**	State Forest Enterprises
MFRA	Mediterranean Forest Research Agenda	**SFM**	Sustainable forest management
NACE	General industrial classification of economic activities within the European communities (Nomenclature générale des activités économiques dans les communautés Européennes)	**SHE**	State Hunting Enterprises
NAI	Net annual increment	**SME**	Small and medium-sized enterprise
NATURA 2000	Natura 2000 Networking Programme	**SoEF**	State of Europe's Forests
NFI	National forest inventory	**SRA**	Strategic Research Agenda
NFP	National forest programme	**TBFRA**	Temperate and Boreal Forest Resources Assessment
NGO	Non-governmental organization	**Tg**	teragram (Tg = 1012 g)
NOK	Norwegian krone n.s. not significant, indicating a very small value	**TOE**	tonne oil equivalent
NWFP	Non-wood forest product	**TSI**	Timber stand improvement
NWGs	Non-wood goods	**UN COMTRADE**	United Nations Commodity Trade Statistics Database
NWGS	Non-wood goods and services	**UNCBD**	UN Convention on Biological Diversity
NUTS	The Nomenclature of Territorial Units for Statistics (Nomenclature des unités territoriales statistiques)	**UNCCD**	UN Convention to Combat Desertification
OC	organic carbon	**UNCED**	United Nations Conference on Environment and Development
OWL	Other wooded land	**UNECE**	United Nations Economic Commission for Europe
PAWS-Med	Forest Pedagogic and Environmental Education	**UNEP**	United Nations Environmental Programme
pcs	pieces	**UNESCO**	United Nations Educational, Scientific and Cultural Organization
PEEN	Pan-European Ecological Network	**UNFF**	United Nations Forum on Forests
PEFC	Programme for the Endorsement of Forest Certification	**UNFCCC**	United Nations Framework Convention on Climate Change
pH	logarithmic measure of hydrogen ion concentration	**UNIDO**	United Nations Industrial Development Organization
R&D	Research and Development	**WRB**	World Reference Base
PJ	petajoule	**VILMAT**	Programme for Developing Recreation and Nature Travel yr year

Annexes

Annex 1: Advisory Group on the preparation of the 4th report "State of Europe's Forests"

Expert	Organization	email
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Annex 2: Materials and Methods

The State of Europe's Forests 2015 report was compiled using information relating to the pan-European Criteria and indicators for Sustainable Forest Management endorsed at the fourth Ministerial Conference on the Protection of Forests in Europe in 2003.

Most of the information was provided by the national correspondents (NCs) through two questionnaires.

Information on the pan-European quantitative indicators was collected through the "Joint FOREST EUROPE/ UNECE/FAO Questionnaire on Pan-European Indicators for Sustainable Forest Management", which was developed by the Forestry and Timber Section of the United Nations Economic Commission for Europe (UNECE)/Food and Agriculture Organization (FAO).

Information on seven quantitative indicators was provided by the international data providers (IDP) listed in the table provided below.

For the first time, the 2015 edition of the State of Europe's Forests report was produced at the same time as the Global Forest Resources Assessment (FRA 2015). A joint data collection process with FAO's FRA 2015 and other regional processes (Montreal Process, the International Tropical Timber Organization, the Observatoire des Forêts de l'Afrique Centrale and the UNECE/FAO Forestry and Timber Section) was developed with a view to enhancing the quality and harmonization of data collection and reporting. The result of this process was the Collaborative Forest Resources Questionnaire (CFRQ), which was led by Kenneth MacDicken (FAO). The CFRQ was included in the "Forest Data Reporting Package for 2015", which was distributed by the FAO.

Information on pan-European qualitative indicators was collected through the completion of the on-line Questionnaire on Qualitative Indicators developed by the Liaison Unit Madrid (LUM). This questionnaire was improved and developed on the basis of the recommendations and suggestions made by the Advisory Group on the compilation of the SoEF 2015 and in close collaboration with FAO and the European Forest Institute (EFI). The new version was developed on the basis of a comparison with the 2011 version and by learning from previous experience. An attempt was also made to reduce the reporting burden on countries and increase the comprehension and the readability of the questionnaire.

The data on the quantitative and qualitative indicators were compiled, checked and verified in consultation with the national correspondents where necessary. A team of experts worked on the quantitative indicators under the supervision of the UNECE/FAO Forestry and Timber Section and the qualitative indicators were analyzed by experts from the EFI working in close collaboration with the LUM.

The vast set of disaggregated data provided by the National Correspondents was extracted from the national reports and organized and converted into the form of the output tables. As was the case in the previous report, and as agreed by the Advisory Group, the output tables generated from the questionnaire on the quantitative indicators are included in the current edition of the SoEF report.

To facilitate the process for the drafting of the SoEF 2015 report, the information on quantitative indicators was analyzed so as to provide a preliminary view of the current state (status) based on the latest reference year and a preliminary view of the trends applicable to the variables reported more than once. In this edition of the SoEF we focused on both 25-year (1990-2015) and 10-year (2005-2015) trends.

The drafting of the reports on the qualitative indicators was based on the summarized tables derived from the national information.

Three reviewing stages were applied: for both indicator types (i.e. qualitative and quantitative), the chapters drafted by the authors were reviewed and coordinated by the lead authors, whose responsibility it was to ensure that the chapter(s) assigned to them were comprehensive, coherent and consistent with the data and information provided by the countries. The second reviewing stage was carried out by the coordinating lead authors, who supervised the compilation of the report and ensured that all parts were complete, coherent and in line with expected standards. The final reviewing stage was carried out by the external reviewers.

Indicators Data Providers

No.	Indicator	1990	2000	2005	2010	2015	Data reference	Data provider
C 1: Forest Resources and Carbon								
1.1	Forest area	x	x	x	x	x	Data for one reporting year	
1.2	Growing stock	x	x	x	x	x	Data for one reporting year	
1.3	Age structure and/or diameter distribution	x	x	x	x		Data for one reporting year	
1.4	Carbon stock	x	x	x	x	x	Data for one reporting year	
C 2: Maintenance of Forest Ecosystem Health and Vitality								
2.1	Deposition of air pollutants	x	x	x	x			ICP/JRC – will be reported through IDP
2.2	Soil condition	x	x	x	x			JRC – will be reported through IDP*
2.3	Defoliation	x	x	x	x			ICP/JRC – will be reported through IDP
2.4	Forest damage	x	x	x	x		Data for one reporting year	
C 3: Productive Functions of Forests (Wood and Non-Wood)								
3.1	Increment and fellings	x	x	x	x		Data for a five-year period	
3.2	Roundwood	x	x	x	x	x	Annual data for the period 1988-2012	UNECE-JFSQ – partly pre-filled
3.3	Non-wood goods				x		Data for one reporting year	
3.4	Services				x		Data for one reporting year	
3.5	Forests under management plans	x	x	x	x		Data for one reporting year	
C 4: Biological Diversity in Forest Ecosystems								
4.1	Tree species composition	x	x	x	x		Data for one reporting year	
4.2	Regeneration	x	x	x	x		Data for one reporting year and for a five-year period	
4.3	Naturalness	x	x	x	x	x	Data for one reporting year	
4.4	Introduced tree species	x	x	x	x	x	Data for one reporting year	
4.5	Deadwood	x	x	x	x		Data for one reporting year	
4.6	Genetic resources	x	x	x	x			Biodiversity International – will be reported through IDP
4.7	Landscape pattern	x	x	x				EU JRC – will be reported through IDP
4.8	Threatened forest species	x	x	x	x		Data for one reporting year	
4.9	Protected forests	x	x	x	x	x	Data for one reporting year	
C 5: Protective Functions in Forest Management								
5.1	Protective forests: – soil, water and other ecosystem functions	x	x	x	x	x	Data for one reporting year	
5.2	Protective forests: infrastructure and managed natural resources	x	x	x	x	x	Data for one reporting year	
C 6: Socio-economic functions and conditions								
6.1	Forest holdings	x	x	x	x		Data for one reporting year	
6.2	Contribution of forest sector to GDP	x	x	x	x		Data for one reporting year	EUROSTAT (EA/IEEAF) /FAO – partly pre-filled
6.3	Net revenue	x	x	x	x		Data for one reporting year	EUROSTAT (IEEAF) – partly pre-filled
6.4	Expenditures for services	x	x	x	x		404.8	49880.0
6.5	Forest sector workforce	x	x	x	x		Data for a three-year period	EUROSTAT – partly pre-filled
6.6	Occupational safety and health	x	x	x	x		Data for a five-year period	
6.7	Wood consumption	x	x	x	x	x	Annual data for 1988-2013 period and data for five-year periods	UNECE-JFSQ – will be reported through IDP
6.8	Trade in wood	x	x	x	x	x	Annual data 1988-2013 period and data for five-year periods	UNECE-JFSQ – will be reported through IDP
6.9	Energy from wood resources			x	x	x	Data for 2007, 2009, 2011 (JWEE reporting years)	UNECE-JWEE – partly pre-filled
6.10	Accessibility for recreation	x	x	x	x		Data for one reporting year For intensity of use - latest available	
6.11	Cultural and spiritual values				x		Data for latest available year	

Note: Years marked with an "x" are covered by 2015 reporting, the grey shading shows indicators covered by the national questionnaire.
Source: *Joint FOREST EUROPE/UNECE/FAO questionnaire on the Pan-European Indicators for Sustainable Forest Management.*
*Since no new soil data were available from ICP Forests, the CLA in coordination with LUM, opted for the use of the LUCAS data available at the JRC.

Annex 3: FOREST EUROPE Signatory countries (by Country Groups in State of Europe's Forest 2015)

Country group	Country
Russian Federation	Russian Federation *
North Europe	Denmark
	Estonia
	Finland
	Iceland
	Latvia
	Lithuania
	Norway
	Sweden
Central-West Europe	Austria
	Belgium
	France
	Germany
	Ireland
	Liechtenstein
	Luxembourg
	Netherlands
	Switzerland
	United Kingdom
Central-East Europe	Belarus
	Czech Republic
	Georgia
	Hungary
	Poland
	Moldova
	Romania
	Slovakia
	Ukraine
South-West Europe	Andorra
	Holy See
	Italy
	Malta
	Monaco
	Portugal
	Spain
South-East Europe	Albania
	Bosnia and Herzegovina
	Bulgaria
	Croatia
	Cyprus
	Greece
	Montenegro
	Serbia
	Slovenia
	The former Yugoslav Republic of Macedonia
	Turkey

Annex 4: Pan-European Quantitative and Qualitative Indicators for Sustainable Forest Management.

No	Indicator name	Full text
Criterion 1: Maintenance and Appropriate Enhancement of Forest Resources and their Contribution to Global carbon Cycles.		
1.1	Forest area	Area of forest and other wooded land, classified by forest type and by availability for wood supply, and share of forest and other wooded land in total land area.
1.2	Growing stock	Growing stock on forest and other wooded land, classified by forest type and by availability for wood supply.
1.3	Age structure and/or diameter distribution	Age structure and/or diameter distribution of forest and other wooded land, classified by forest type and by availability for wood supply.
1.4	Carbon stock	Carbon stock of woody biomass and of soils on forest and other wooded land.
Criterion 2: Maintenance of Forest Ecosystem Health and Vitality		
2.1	Deposition of air pollutants	Deposition of air pollutants on forest and other wooded land, classified by N. S and base cations.
2.2	Soil condition	Chemical soil properties (pH, CEC, C/N, organic C, base saturation) on forest and other wooded land related to soil acidity and eutrophication, classified by main soil types.
2.3	Defoliation	Defoliation of one or more main tree species on forest and other wooded land in each of the defoliation classes "moderate", "severe" and "dead".
2.4	Forest damage	Forest and other wooded land with damage, classified by primary damaging agent (abiotic, biotic and human induced) and by forest type.
Criterion 3: Maintenance and Encouragement of Productive Functions of Forest (Wood and Non-Wood)		
3.1	Increment and fellings	Balance between net annual increment and annual fellings of wood on forest available for wood supply.
3.2	Roundwood	Value and quantity of marketed roundwood.
3.3	Non-wood goods	Value and quantity of marketed non-wood goods from forest and other wooded land.
3.4	Services	Value of marketed services on forest and other wooded land.
3.5	Forest under management plans	proportion of forest and other wooded land under a management plan or equivalent.
Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems		
4.1	Tree species composition	Area of forest and other wooded land, classified by number of tree species occurring and by forest type.
4.2	Regeneration	Area of regeneration within even-aged stands and uneven-aged stands, classified by regeneration type.
4.3	Naturalness	Area of forest and other wooded land, classified by "undisturbed by man", by "semi-natural" or by "plantations" each by forest type.
4.4	Introduced tree species	Area of forest and other wooded land dominated by introduced tree species.
4.5	Deadwood	Volume of standing deadwood and of lying deadwood on forest and other wooded land classified by forest type.
4.6	Genetic resources	Area managed for conservation and utilisation of forest tree genetic resources (in situ and ex situ gene conservation) and area managed for seed production.
4.7	Landscape pattern	Landscape-level spatial pattern of forest cover
4.8	Threatened forest species	Number of threatened forest species, classified according to IUCN red List categories in relation to total number of forest species.
4.9	Protected forests	Area of forest and other wooded land protected to conserve biodiversity, landscapes and specific natural elements, according to MCPFE Assessment Guidelines.
Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)		
5.1	Protective forests - soil, water and other ecosystem functions.	Area of forest and other wooded land designated to prevent soil erosion, to preserve water resources, or to maintain other forest ecosystem functions, part of MCPFE Class "Protective Functions".
5.2	Protective forests- infraestructure and managed natural resources	Area of forest and other wooded land designated to protect infrastructure and managed natural resources against natural hazards, part of MCPFE Class "Protective Functions".
Criterion 6: Maintenance of Other Socio-Economic Functions and Conditions		
6.1	Forest holdings	Number of forest holdings, classified by ownership categories and size classes.
6.2	Contribution of forest sector to GDP	Contribution of forestry and manufacturing of wood and paper products to gross domestic product.
6.3	Net revenue	Net revenue of forest enterprises.
6.4	Expenditures for services	Total expenditures for long-term sustainable services from forests.

No	Indicator name	Full text
6.5	Forest sector workforce	Munber of persons employed and labour input in the forest sector, classified by gender and age group, education and job characteristics
6.6	occupational safety and health	Frequency of occupational accidents and occupational diseases in forestry.
6.7	Wood consumption	Consumption per head of wood and products derived from wood.
6.8	Trade in wood	Imports and exports of wood and products derived from wood.
6.9	Energy from wood resources	Share of wood energy in total energy consumption, classified by origin of wood.
6.10	Accesssibility for recreation	Area of forest and other wooded land where public has a right of access for recreational purposes and indication of intensity of use.
6.11	Cultural and spiritual values	Number of sites within forest and other wooded land designated as having cultural or spiritual values.

Pan-European Qualitative Indicators for Sustainable Forest Management

No	Indicator name
A: Overall policies, institutions and instruments for sustainable forest management	
A.1	National forest programmes or similar.
A.2	Institutional frameworks
A.3	Legal/regulatory frameworks and international commitments
A.4	Financial instruments/economic policy
A.5	Informal means.
B: Policies, institutions and instruments by policy area	
B.1	Land use and forest area and other wooded land (Criterion 1).
B.2	Carbon balance (Criterion 1).
B.3	Health and vitality (Criterion 2)
B.4	Production and use of wood (criterion 3).
B.5	production and use of non-wood goods and services, provision of especially recreation (Criterion 3).
B.6	Biodiversity (Criterion 4).
B.7	Protective forests and other wooded land (Criterion 5).
B.8	Economic viability (Criterion 6).
B.9	Employment (incl. Safety and health) (Criterion 6).
B.10	Research, training and education (Criterion 6).
B.11	Public awareness amd participation (Criterion 6).
B.12	Cultural and spiritual values (Criterion 6).

Annex 5 : List of National Correspondents who Applied Data on Quantitative Indicators for Sustainable Forest Management

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Table 1: Basic data on countries. 2015

Country	Land area [1,000 ha]	Forest & OWL			Population (2013)				GDP (2013)		
		1,000 ha	% of land area	Forest & OWL per inhabitant [ha]	Total [1,000]	Density [inhabitants per km²]	Rural [1,000]	Density rural [inhabitants per km²]	GDP total [billion Euro]	Per inhabitant [Euro PPS]	Real growth rate [%]
Albania	2,751.5	1,237.2	45	0.45	2,773.6	101	1,237.5	45	10	7,600	1.3
Andorra	45	16	35.6	0.2	79.2	176	1.1	2.4	2	35,100	-0.1
Austria	8,243.5	4,022	48.8	0.47	8,473.8	103	2,890.9	35.1	323	34,000	0.2
Belarus	20,748	9,228.8	44.5	0.97	9,466	46	2,283.5	11	54	13,300	0.9
Belgium	3,027.8	719.1	23.7	0.06	11,195.1	370	24.9	0.8	395	31,600	0.3
Bosnia and Herzegovina	5,120	2,799.2	54.7	0.73	3,829.3	75	2,317.3	45.3	13	6,500	2.5
Bulgaria	10,856	3,845	35.4	0.53	7,265.1	67	1,939.8	17.9	41	11,900	1.1
Croatia	5,596	2,491	44.5	0.59	4,252.7	76	1,770.9	31.6	44	16,100	-0.9
Cyprus	924.2	386.2	41.8	0.34	1,141.2	123	375.1	40.6	18	23,600	-5.4
Czech Republic	7,721.6	2,667.4	34.5	0.25	10,521.5	136	2,834.5	36.7	157	21,900	-0.7
Denmark	4,243	657.7	15.5	0.12	5,613.7	132	711.6	16.8	253	33,100	-0.5
Estonia	4,522.7	2,455.5	54.3	1.85	1,324.6	29	427.6	9.5	19	19,500	1.6
Finland	30,389	23,019	75.7	4.23	5,439.4	18	872.9	2.9	202	30,100	-1.3
France	54,766	17,579	32.1	0.27	66,028.5	121	13,829.7	25.3	2,114	28,400	0.3
Georgia	6,949	2,829.3	40.7	0.63	4,476.9	64	2,090.3	30.1	12	5,400	3.2
Germany	34,861	11,419	32.8	0.14	80,621.8	231	20,244.1	58.1	2,809	32,900	0.1
Greece	12,890	6,539	50.7	0.59	11,032.3	86	2,499.6	19.4	182	19,300	-3.9
Holy See	0.04	0	0	0	0.8	1,900	0	0	-	-	-
Hungary	9,303.6	2,190.4	23.5	0.22	9,897.2	106	2,938.9	31.6	101	17,600	1.5
Iceland	10,025	193.3	1.9	0.6	323	3	19.6	0.2	12	31,600	3.5
Ireland	6,889	801.2	11.6	0.17	4,595.3	67	1,715.6	24.9	175	34,500	0.2
Italy	29,414	11,110	37.8	0.19	59,831.1	203	18,735.5	63.7	1,619	26,500	-1.9
Latvia	6,218	3,468	55.8	1.72	2,013.4	32	654.8	10.5	23	17,000	4.2
Liechtenstein	14.8	7.4	50	0.2	36.9	249	31.6	213.7	4	-	1.9
Lithuania	6,267.5	2,284	36.4	0.77	2,956.1	47	988.7	15.8	35	19,400	3.3
Luxembourg	259	88.2	34.1	0.16	543.2	210	58.1	22.4	45	68,500	2
Malta	32	0.3	1.1	0	423.3	1,323	20.6	64.3	8	22,900	2.5
Moldova	3,285	483	14.7	0.14	3,559	108	1,961.8	59.7	6	3,500	8.9
Monaco	0.2	0	0	0	37.8	18,728	0	0	5	-	9.3
Montenegro	1,381.3	964.3	69.8	1.55	621.4	45	225.9	16.4	3	10,800	3.5
Netherlands	3,375	376	11.1	0.02	16,804.2	498	1,802.9	53.4	643	34,900	-0.7
Norway	30,427	14,124	46.4	2.78	5,084.2	17	1,019.9	3.4	393	49,600	0.7
Poland	30,622	9,435	30.8	0.24	38,530.7	126	15,174.6	49.6	396	17,900	1.7
Portugal	9,025.5	4,907.2	54.4	0.47	10,459.8	116	3,939.4	43.6	171	21,000	-1.4
Romania	23,002	6,951	30.2	0.35	19,963.6	87	9,136.3	39.7	144	14,500	3.4
Russian Federation *	1,638,139	882,310	53.9	6.29	140,366.6	9	37,664.6	2.3	883	10,700	-7.9
Serbia	8,746	3,228	36.9	0.45	7,164	82	3,197.1	36.6	34	9,800	2.6
Slovakia	4,810	1,940	40.3	0.36	5,414.1	113	2,493.5	51.8	74	20,000	1.4
Slovenia	2,014	1,271	63.1	0.62	2,060.5	102	1,035.1	51.4	36	21,800	-1
Spain	49,880	27,626.7	55.4	0.59	46,647.4	94	9,735.8	19.5	1,049	25,000	-1.2
Sweden	41,033	30,505	74.3	3.18	9,592.6	23	1,389.6	3.4	436	33,700	1.3
Switzerland	4,000	1,324	33.1	0.16	8,081.5	202	2,118.4	53	516	43,000	1.9
FYROM	2,543	1,130.5	44.5	0.54	2,107.2	83	906.5	35.6	8	9,500	2.7
Turkey	76,963	21,862.5	28.4	0.29	74,932.6	97	20,703.9	26.9	619	14,000	4.1
Ukraine	57,938	9,683	16.7	0.21	45,489.6	79	13,977.1	24.1	142	6,600	3.2
United Kingdom	24,193	3,164	13.1	0.05	64,097.1	265	11,478.5	47.4	2,017	28,900	1.7

Sources: Land. Forest. Other Wodded Land:
FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
Population: Total population: http://data.worldbank.org/indicator/SP.POP.TOTL
Rural Population: http://data.worldbank.org/indicator/SP.RUR.TOTL/countries
Population of Holy See: http://www.indexmundi.com/g/g.aspx?c=vt&v=21

Table 2: Ind 1.1A Extent of forest and other wooded land. 2015

Country	Land area						
	Forest		Other wooded land		Other land		Total
					Total	Of which with tree cover	
	1,000 ha	% of land area	1,000 ha	% of land area	1,000 ha		
Albania	785	28.5	452.2	16.4	1,514.3	-	2,751.5
Andorra	16	35.6	0	0	29	-	45
Austria	3,869	46.9	153	1.9	4,221.5	-	8,243.5
Belarus	8,633.5	41.6	595.3	2.9	11,519.2	-	20,748
Belgium	683.4	22.6	35.7	1.2	2,308.7	-	3,027.8
Bosnia and Herzegovina	2,115	41.3	684.2	13.4	2,320.8	-	5,120
Bulgaria	3,823	35.2	22	0.2	7,011	18	10,856
Croatia	1,922	34.3	569	10.2	3,105	205	5,596
Cyprus	172.7	18.7	213.5	23.1	538	9.9	924.2
Czech Republic	2,667.4	34.5	0	0	5,054.2	93	7,721.6
Denmark	612.2	14.4	45.5	1.1	3,585.3	3.1	4,243
Estonia	2,232	49.3	223.6	4.9	2,067.2	-	4,522.7
Finland	22,218	73.1	801	2.6	7,370	231	30,389
France	16,989	31	590	1.1	37,187	320	54,766
Georgia	2,822.4	40.6	6.9	0.1	4,119.7	-	6,949
Germany	11,419	32.8	0	0	23,442	1,400	34,861
Greece	3,903	30.3	2,636	20.4	6,351	-	12,890
Holy See	0	0	0	0	0.04	0	0.04
Hungary	2,069.1	22.2	121.3	1.3	7,113.2	103	9,303.6
Iceland	49.1	0.5	144.2	1.4	9,831.7	9.7	10,025
Ireland	754	10.9	47.2	0.7	6,087.8	-	6,889
Italy	9,297	31.6	1,813	6.2	18,304	-	29,414
Latvia	3,356	54	112	1.8	2,750	29	6,218
Liechtenstein	6.2	38.8	0.5	3.1	9.3	-	16
Lithuania	2,180	34.8	104	1.7	3,983.5	63	6,267.5
Luxembourg	86.8	33.5	1.4	0.5	170.9	-	259
Malta	0.3	1.1	0	0	31.7	-	32
Moldova	409	12.5	74	2.3	2,802	-	3,285
Monaco	0	0	0	0	0.2	0	0.2
Montenegro	826.8	59.9	137.5	10	417	-	1,381.3
Netherlands	376	11.1	0	0	2,999	-	3,375
Norway	12,112	39.8	2,012	6.6	16,303	-	30,427
Poland	9,435	30.8	0	0	21,187	-	30,622
Portugal	3,182.1	35.3	1,725.1	19.1	4,118.3	566.2	9,025.5
Romania	6,861	29.8	90	0.4	16,051	706	23,002
Russian Federation *	809,090	49.4	73,220	4.5	755,829	-	1,638,139
Serbia	2,720	31.1	508	5.8	5,518	-	8,746
Slovakia	1,940	40.3	0	0	2,870	275	4,810
Slovenia	1,248	62	23	1.1	743	33	2,014
Spain	18,417.9	36.9	9,208.8	18.5	22,253.3	404.8	49,880
Sweden	28,073	68.4	2,432	5.9	10,528	864	41,033
Switzerland	1,254	31.4	70	1.8	2,676	318	4,000
FYROM	987.5	38.8	143	5.6	1,412.5	-	2,543
Turkey	11,943	15.5	9,919.5	12.9	55,100.5	2,934	76,963
Ukraine	9,657	16.7	26	0.04	48,255	907	57,938
United Kingdom	3,144	13	20	0.1	21,029	24	24,193

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 3: Ind 1.1B Change in extent of forest. 1990-2015

Country	Forest [1,000 ha]	Forest								
		Area [1,000 ha]					Annual change rate			
							1990 2015		2005 2015	
	2015	1990	2000	2005	2010	2015	1,000 ha/yr	%	1,000 ha/yr	%
Albania	785	789	769.6	782.6	776	785	-0.16	-0.02	0.24	0.03
Andorra	16	16	16	16	16	16	0	0	0	0
Austria	3,869	3,776	3,838	3,851	3,860	3,869	3.72	0.1	1.8	0.05
Belarus	8,633.5	7,780	8,273	8,436	8,630	8,633.5	34.14	0.42	19.75	0.23
Belgium	683.4	677.4	667.3	674.2	681.2	683.4	0.24	0.04	0.92	0.14
Bosnia and Herzegovina	2,115	2,210	2,185	2,185	2,102.7	2,115	-3.8	-0.18	-7	-0.33
Bulgaria	3,823	3,327	3,375	3,651	3,737	3,823	19.84	0.56	17.2	0.46
Croatia	1,922	1,850	1,885	1,903	1,920	1,922	2.88	0.15	1.9	0.1
Cyprus	172.7	161.1	171.6	172.9	172.8	172.7	0.46	0.28	-0.02	-0.01
Czech Republic	2,667.4	2,629.4	2,637.3	2,647.4	2,657.4	2,667.4	1.52	0.06	2	0.08
Denmark	612.2	543.2	585.5	557.7	587.1	612.2	2.76	0.48	5.45	0.94
Estonia	2,232	2,205.9	2,242.6	2,252.1	2,233.9	2,232	1.04	0.05	-2.01	-0.09
Finland	22,218	21,896.8	22,458.6	22,162	22,218	22,218	12.85	0.06	5.6	0.03
France	16,989	14,436	15,289	15,861	16,424	16,989	102.12	0.65	112.8	0.69
Georgia	2,822.4	2,752.3	2,760.6	2,772.5	2,822.4	2,822.4	2.8	0.1	4.99	0.18
Germany	11,419	11,300	11,354	11,384	11,409	11,419	4.76	0.04	3.5	0.03
Greece	3,903	3,299	3,601	3,752	3,903	3,903	24.16	0.67	15.1	0.4
Holy See	0	0	0	0	0	0	0	-	0	-
Hungary	2,069.1	1,801.3	1,907.5	1,983.3	2,046.4	2,069.1	10.71	0.56	8.59	0.42
Iceland	49.1	16.1	28.8	36.5	42.7	49.1	1.32	4.58	1.27	3.03
Ireland	754	465	635	694.8	725.6	754	11.56	1.95	5.92	0.82
Italy	9,297	7,590	8,369	8,759	9,028	9,297	68.28	0.81	53.8	0.6
Latvia	3,356	3,173	3,241	3,297	3,354	3,356	7.32	0.22	5.9	0.18
Liechtenstein	6.2	6.1	6.1	6.1	6.2	6.2	0	0.07	0.01	0.16
Lithuania	2,180	1,945	2,020	2,121	2,170	2,180	9.4	0.46	5.9	0.27
Luxembourg	86.8	85.8	86.8	86.8	86.8	86.8	0.04	0.04	0	0
Malta	0.3	0.3	0.3	0.3	0.3	0.3	0	0	0	0
Moldova	409	319	324	363	386	409	3.6	1	4.6	1.2
Monaco	0	0	0	0	0	0	0	-	0	-
Montenegro	826.8	626.2	626.2	626.2	826.8	826.8	8.02	1.12	20.06	2.82
Netherlands	376	345	360	365	373.5	376	1.24	0.34	1.1	0.3
Norway	12,112	12,132	12,113	12,092	12,102	12,112	-0.8	-0.01	2	0.02
Poland	9,435	8,881	9,059	9,200	9,329	9,435	22.16	0.24	23.5	0.25
Portugal	3,182.1	3,436.2	3,342.7	3,296	3,239.1	3,182.1	-10.16	-0.31	-11.39	-0.35
Romania	6,861	6,371	6,366	6,391	6,515	6,861	19.6	0.3	47	0.71
Russian Federation *	809,090	808,949.9	809,268.5	808,790	809,090	-	-	-	-	-
Serbia	2,720	2,313	2,460	2,476	2,713	2,720	16.28	0.65	24.4	0.94
Slovakia	1,940	1,921.7	1,921.4	1,931.6	1,938.9	1,940	0.73	0.04	0.84	0.04
Slovenia	1,248	1,188	1,233	1,243	1,247	1,248	2.4	0.2	0.5	0.04
Spain	18,417.9	13,809.5	16,976.9	17,282.1	18,247.2	18,417.9	184.34	1.16	113.58	0.64
Sweden	28,073	28,063	28,163	28,218	28,073	28,073	0.4	0	-14.5	-0.05
Switzerland	1,254	1,151	1,194	1,217	1,235	1,254	4.12	0.34	3.7	0.3
FYROM	987.5	912	958	975	960.4	987.5	3.02	0.32	1.25	0.13
Turkey	11,943	9,622	10,183	10,662	11,202.8	11,943	92.84	0.87	128.1	1.14
Ukraine	9,657	9,274	9,510	9,575	9,548	9,657	15.32	0.16	8.2	0.09
United Kingdom	3,144	2,778	2,954	3,021	3,059	3,144	14.64	0.5	12.3	0.4

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 4: Ind 1.1C Change in extent of forest available for wood supply. 1990-2015

Country	Forest [1,000 ha]	Forest								
		Area [1,000 ha]					Annual change rate			
							1990 2015		2005 2015	
	2015	1990	2000	2005	2010	2015	1,000 ha/yr	%	1,000 ha/yr	%
Albania	785	685	620	611.3	587.1	565	-4.8	-0.77	-4.6	-0.78
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,869	3,308	3,342	3,343	3,341	3,339	1.2	0.04	-0.4	-0.01
Belarus	8,633.5	5,924.7	6,350.3	6,376.3	6,478.6	6,478.2	22.1	0.36	10.2	0.16
Belgium	683.4	673	663	665.4	667.9	670.3	-0.1	-0.02	0.5	0.07
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	2,365	2,258	2,561	2,387	2,213	-6.1	-0.27	-34.8	-1.45
Croatia	1,922	1,758	1,749	1,745	1,741	1,740	-0.7	-0.04	-0.5	-0.03
Cyprus	172.7	43.2	43.2	41.4	41.4	41.1	-0.1	-0.2	-0.03	-0.07
Czech Republic	2,667.4	2,575	2,561	2,518.5	2,310.4	2,300.8	-11	-0.45	-21.8	-0.9
Denmark	612.2	538.2	566.5	533.6	552.1	572.2	1.4	0.25	3.9	0.7
Estonia	2,232	2,079	2,102.5	2,074.1	2,008.3	1,993.8	-3.4	-0.17	-8	-0.39
Finland	22,218	20,448	20,317.3	20,050.9	19,465	19,465	-39.3	-0.2	-58.6	-0.3
France	16,989	13,779	14,465	15,195	15,607	16,018	89.6	0.6	82.3	0.53
Georgia	2,822.4	566.4	566.4	576.9	587.5	587.5	0.8	0.15	1.1	0.18
Germany	11,419	10,486.8	10,833.2	10,861.9	10,885.7	10,888	16	0.15	2.6	0.02
Greece	3,903	3,038.4	3,316.5	3,455.6	3,594.7	3,594.7	22.3	0.67	13.9	0.4
Holy See	0	0	0	0	0	0	0	-	0	-
Hungary	2,069.1	1,530.7	1,622.1	1,684.1	1,729.3	1,778.8	9.9	0.6	9.5	0.55
Iceland	49.1	4.9	12.9	17.7	21.6	25.6	0.8	6.81	0.8	3.76
Ireland	754	-	-	579.7	608.2	632	-	-	5.2	0.87
Italy	9,297	6,707.9	7,396.3	7,741	7,978.7	8,216.5	60.3	0.81	47.5	0.6
Latvia	3,356	2,824	3,024	3,088	3,149	3,151	13.1	0.44	6.3	0.2
Liechtenstein	6.2	3.6	4	4	4	4	0.02	0.42	0	0
Lithuania	2,180	1,695	1,756	1,835	1,852	1,924	9.2	0.51	8.9	0.47
Luxembourg	86.8	85.8	86.8	86.1	86.1	86.1	0.01	0.01	0	0
Malta	0.3	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	-	0	-
Montenegro	826.8	544.5	544.5	544.5	675.4	675.4	5.2	0.87	13.1	2.18
Netherlands	376	276	288	293.4	298.8	301	1	0.35	0.8	0.26
Norway	12,112	8,510	8,448	8,393	8,326	8,259	-10	-0.12	-13.4	-0.16
Poland	9,435	8,323	8,342	8,417	8,128	8,234	-3.6	-0.04	-18.3	-0.22
Portugal	3,182.1	2,274.8	2,228.8	2,205.8	2,147	2,088.2	-7.5	-0.34	-11.8	-0.55
Romania	6,861	5,617	5,029	5,049	5,147	4,627	-39.6	-0.77	-42.2	-0.87
Russian Federation *	809,090	698,527	703,780.7	690,978.2	677,203.7	-	-	-	-	-
Serbia	2,720	-	-	-	-	-	-	-	-	-
Slovakia	1,940	1,772	1,767	1,751	1,779	1,785	0.5	0.03	3.4	0.19
Slovenia	1,248	1,114	1,157	1,166	-	1,139	1	0.09	-2.7	-0.23
Spain	18,417.9	-	-	13,803.9	14,574.8	14,711.1	-	-	90.7	0.64
Sweden	28,073	22,830	20,770.8	20,233.7	20,032.9	19,832.1	-119.9	-0.56	-40.2	-0.2
Switzerland	1,254	1,117	1,155	1,177	1,193	1,208	3.6	0.31	3.1	0.26
FYROM	987.5	804	804	804	804	804	0	0	0	0
Turkey	11,943	8,659	8,648	8,713.5	7,672.8	8,183.5	-19	-0.23	-53	-0.63
Ukraine	9,657	4,164	5,999	5,653	5,122	5,228	42.6	0.91	-42.5	-0.78
United Kingdom	3,144	2,778	2,954	3,021	3,059	3,144	14.6	0.5	12.3	0.4

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 5: Ind 1.1D Forest area (per inhabitant) 1990-2015

Country	Land area (1,000 ha)	Forest area (ha/inhabitant)									
		Forest					Forest available for wood supply				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	0.24	0.25	0.26	0.28	0.28	0.21	0.2	0.2	0.21	0.2
Andorra	16	0.29	0.24	0.2	0.21	0.2	-	-	-	-	-
Austria	3,869	0.49	0.48	0.47	0.46	0.46	0.43	0.42	0.41	0.4	0.39
Belarus	8,633.5	0.76	0.83	0.87	0.91	0.91	0.58	0.63	0.66	0.68	0.68
Belgium	683.4	0.07	0.07	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06
Bosnia and Herzegovina	2,115	0.49	0.57	0.56	0.55	0.55	-	-	-	-	-
Bulgaria	3,823	0.38	0.41	0.47	0.51	0.53	0.27	0.28	0.33	0.32	0.3
Croatia	1,922	0.39	0.43	0.43	0.43	0.45	0.37	0.4	0.39	0.39	0.41
Cyprus	172.7	0.21	0.18	0.17	0.16	0.15	0.06	0.05	0.04	0.04	0.04
Czech Republic	2,667.4	0.25	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.22	0.22
Denmark	612.2	0.11	0.11	0.1	0.11	0.11	0.1	0.11	0.1	0.1	0.1
Estonia	2,232	1.41	1.61	1.66	1.68	1.68	1.32	1.51	1.53	1.51	1.51
Finland	22,218	4.39	4.34	4.22	4.14	4.08	4.1	3.93	3.82	3.63	3.58
France	16,989	0.25	0.25	0.25	0.25	0.26	0.24	0.24	0.24	0.24	0.24
Georgia	2,822.4	0.57	0.62	0.64	0.63	0.63	0.12	0.13	0.13	0.13	0.13
Germany	11,419	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.14
Greece	3,903	0.32	0.33	0.34	0.35	0.35	0.3	0.3	0.31	0.32	0.33
Holy See	0	0	0	0	0	0	0	0	0	0	0
Hungary	2,069.1	0.17	0.19	0.2	0.2	0.21	0.15	0.16	0.17	0.17	0.18
Iceland	49.1	0.06	0.1	0.12	0.13	0.15	0.02	0.05	0.06	0.07	0.08
Ireland	754	0.13	0.17	0.17	0.16	0.16	-	-	0.14	0.13	0.14
Italy	9,297	0.13	0.15	0.15	0.15	0.16	0.12	0.13	0.13	0.13	0.14
Latvia	3,356	1.19	1.37	1.47	1.6	1.67	1.06	1.28	1.38	1.5	1.57
Liechtenstein	6.2	0.21	0.18	0.18	0.17	0.17	0.13	0.12	0.12	0.11	0.11
Lithuania	2,180	0.53	0.58	0.64	0.7	0.74	0.46	0.5	0.55	0.6	0.65
Luxembourg	86.8	0.22	0.2	0.19	0.17	0.16	0.22	0.2	0.19	0.17	0.16
Malta	0.3	0	0	0	0	0	-	-	-	-	-
Moldova	409	0.09	0.09	0.1	0.11	0.11	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	0	0	0	0
Montenegro	826.8	1.02	1.02	1.02	1.33	1.33	0.89	0.89	0.88	1.09	1.09
Netherlands	376	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Norway	12,112	2.86	2.7	2.62	2.48	2.38	2.01	1.88	1.82	1.7	1.62
Poland	9,435	0.23	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.21	0.21
Portugal	3,182.1	0.34	0.32	0.31	0.31	0.3	0.23	0.22	0.21	0.2	0.2
Romania	6,861	0.27	0.28	0.3	0.32	0.34	0.24	0.22	0.24	0.25	0.23
Russian Federation *	809,090	5.46	5.52	5.65	5.76	-	4.72	4.8	4.83	4.82	-
Serbia	2,720	0.3	0.33	0.33	0.37	0.38	-	-	-	-	-
Slovakia	1,940	0.36	0.36	0.36	0.36	0.36	0.33	0.33	0.33	0.33	0.33
Slovenia	1,248	0.59	0.62	0.62	0.61	0.61	0.56	0.58	0.58	-	0.55
Spain	18,417.9	0.36	0.42	0.4	0.39	0.39	-	-	0.32	0.31	0.32
Sweden	28,073	3.28	3.17	3.13	2.99	2.93	2.67	2.34	2.24	2.14	2.07
Switzerland	1,254	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.15	0.15
FYROM	987.5	0.45	0.47	0.47	0.46	0.47	0.4	0.39	0.38	0.38	0.38
Turkey	11,943	0.18	0.16	0.16	0.16	0.16	0.16	0.14	0.13	0.11	0.11
Ukraine	9,657	0.18	0.19	0.2	0.21	0.21	0.08	0.12	0.12	0.11	0.11
United Kingdom	3,144	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 6:Ind 1.2A Growing stock (volume) on forest. 2015

Country	Forest [1,000 ha]	Growing stock [million m³]			
		Forest	Of which available for wood supply	Other wooded land	Forest and other wooded land
Albania	785	52	50	23.7	75.7
Andorra	16	-	-	-	-
Austria	3,869	1,155	1,121	0	1,155
Belarus	8,633.5	1,669.3	1,352.8	11.3	1,680.6
Belgium	683.4	187.7	170.1	-	-
Bosnia and Herzegovina	2,115	392.3	392.3	-	-
Bulgaria	3,823	699	492	-	699
Croatia	1,922	414.9	388.8	5.9	420.8
Cyprus	172.7	11.1	3.6	-	-
Czech Republic	2,667.4	791.2	670.9	0	791.2
Denmark	612.2	125.2	115.7	0.5	125.7
Estonia	2,232	476.3	425.5	7.2	483.5
Finland	22,218	2,319.9	2,099.4	7.9	2,327.7
France	16,989	2,860	2,697	-	-
Georgia	2,822.4	454.5	93.9	0.2	454.7
Germany	11,419	3,663	3,492.7	0	3,663
Greece	3,903	185	170	-	-
Holy See	0	0	0	0	0
Hungary	2,069.1	377.1	330.7	-	-
Iceland	49.1	0.5	0.3	0.03	0.5
Ireland	754	116.8	-	-	-
Italy	9,297	1,384.7	1,286	-	-
Latvia	3,356	665	616.1	1.9	666.9
Liechtenstein	6.2	1.8	1.4	-	-
Lithuania	2,180	515	418	3.1	518.1
Luxembourg	86.8	26	-	-	-
Malta	0.3	0.1	-	0	0.1
Moldova	409	50.4	-	3.8	54.2
Monaco	0	0	0	0	0
Montenegro	826.8	121.4	105	0.4	121.8
Netherlands	376	80.9	64.7	0	80.9
Norway	12,112	1,157	1,033	8	1,165
Poland	9,435	2,540	2,190	0	2,540
Portugal	3,182.1	-	-	-	-
Romania	6,861	1,930.4	1,293.4	4.9	1,935.3
Russian Federation *	809,090	81,522.9	68,234.2	1,775.4	83,298.2
Serbia	2,720	418	352.5	37	455
Slovakia	1,940	532.1	439.6	0	532.1
Slovenia	1,248	431.6	393.9	1.4	433
Spain	18,417.9	1,212	944	2.1	1,214.1
Sweden	28,073	2,988.5	2,389.7	7	2,995.5
Switzerland	1,254	442	426	0.7	442.7
FYROM	987.5	76.4	66	-	-
Turkey	11,943	1,506.8	1,032.2	72.5	1,579.4
Ukraine	9,657	2,196	1,438	1	2,197
United Kingdom	3,144	652	652	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 7: Ind 1.2B Change in growing stock on forest. 1990-2015

Country	Forest [1,000 ha]	Forest								
		Growing stock [Million m³]					Annual change rate			
							1990-2015		2005-2015	
	2015	1990	2000	2005	2010	2015	Million m³/yr	%	Million m³/yr	%
Albania	785	75.2	75.4	59.1	52	52	-0.93	-1.5	-0.71	-1.3
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,869	927	1,067	1,102	1,129	1,155	9.12	0.9	5.3	0.5
Belarus	8,633.5	1,002.4	1,339.2	1,434.8	1,597.5	1,669.3	26.68	2.1	23.45	1.5
Belgium	683.4	128	157.4	169.3	178.5	187.7	2.39	1.5	1.84	1
Bosnia and Herzegovina	2,115	291	358	358	389.31	392.28	4.05	1.2	3.43	0.9
Bulgaria	3,823	405	526	591	645	699	11.76	2.2	10.8	1.7
Croatia	1,922	310.34	360.12	385.01	406.29	414.94	4.18	1.2	2.99	0.8
Cyprus	172.7	7.41	7.93	8.38	9.92	11.12	0.15	1.6	0.27	2.9
Czech Republic	2,667.4	624.43	698.68	735.08	754.61	791.24	6.67	1	5.62	0.7
Denmark	612.2	67.27	93.82	114.33	118.02	125.18	2.32	2.5	1.08	0.9
Estonia	2,232	393.3	458.3	455	470.3	476.3	3.32	0.8	2.13	0.5
Finland	22,218	1,881	2,085	2,181	2,319.85	2,319.85	17.55	0.8	13.89	0.6
France	16,989	2,077	2,254	2,512	2,649	2,860	31.32	1.3	34.8	1.3
Georgia	2,822.4	421.2	445.4	455.9	454.5	454.5	1.33	0.3	-0.14	-0.03
Germany	11,419	2,815	3,381	3,502	3,617	3,663	33.92	1.1	16.1	0.5
Greece	3,903	156	170	177	185	185	1.16	0.7	0.8	0.4
Holy See	0	0	0	0	0	0	0	-	0	-
Hungary	2,069.1	287.98	325.16	341.35	359.01	377.05	3.56	1.1	3.57	1
Iceland	49.1	0.03	0.09	0.17	0.29	0.5	0.02	11.9	0.03	11.7
Ireland	754	-	-	69.33	89.95	116.83	-	-	4.75	5.4
Italy	9,297	854.99	1,067.7	1,174.06	1,279.37	1,384.68	21.19	1.9	21.06	1.7
Latvia	3,356	442	537	557	614	665	8.92	1.6	10.8	1.8
Liechtenstein	6.2	1.65	1.75	1.75	1.75	1.75	0	0.2	0	0
Lithuania	2,180	413	449.5	464.6	489.8	515	4.08	0.9	5.04	1
Luxembourg	86.8	20.38	25.95	25.95	25.95	25.95	0.22	1	0	0
Malta	0.3	0.08	0.08	0.08	0.08	0.08	0	0	0	0
Moldova	409	36.7	43	45.3	47.6	50.44	0.55	1.3	0.51	1.1
Monaco	0	0	0	0	0	0	0	-	0	-
Montenegro	826.8	-	72.6	72.6	121.4	121.4	-	-	4.88	5.3
Netherlands	376	52.4	61.1	70	76	80.9	1.14	1.8	1.09	1.5
Norway	12,112	788	898	981	1,069	1,157	14.76	1.5	17.6	1.7
Poland	9,435	1,485	1,736	1,909	2,372	2,540	42.2	2.2	63.1	2.9
Portugal	3,182.1	203	198	185	186	-	-	-	-	-
Romania	6,861	1,347.5	1,346.4	1,351.7	1,377.9	1,930.4	23.32	1.4	57.87	3.6
Russian Federation *	809,090	80,039.64	80,270.39	80,479.05	81,522.85	-	5	-	-	-
Serbia	2,720	235	250	298	415	418	7.32	2.3	12	3.4
Slovakia	1,940	401.6	463.2	494.6	514.1	532.1	5.22	1.1	3.75	0.7
Slovenia	1,248	273.3	332.8	374.1	406.1	431.6	6.33	1.8	5.75	1.4
Spain	18,417.9	663.7	906.05	1,027.23	1,119.6	1,211.97	21.93	2.4	18.47	1.7
Sweden	28,073	2,501.4	2,703.2	2,906.9	2,947.7	2,988.5	19.48	0.7	8.16	0.3
Switzerland	1,254	395	417	422	432	442	1.88	0.5	2	0.5
FYROM	987.5	76.29	78.89	76.38	76.41	76.41	0.01	0.01	0	0
Turkey	11,943	1,021	1,132	1,208.97	1,347.45	1,506.84	19.43	1.6	29.79	2.2
Ukraine	9,657	1,414	1,884	2,004	2,100	2,196	31.28	1.8	19.2	0.9
United Kingdom	3,144	366	480	537	595	652	11.44	2.3	11.5	2

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 8: Ind 1.2C Growing stock (volume per hectare) on forest and other wooded land. 1990-2015

Country	Forest [1,000 ha]	Growing stock [m³/ha]									
		Forest					Other wooded land				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	95.3	98	75.5	67	66.2	26.95	28.3	54.41	88.88	52.48
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,869	245.5	278	286.2	292.5	298.5	0	0	0	0	0
Belarus	8,633.5	128.8	161.9	170.1	185.1	193.4	-	84.08	46.3	31.35	18.98
Belgium	683.4	189	235.9	251.1	262	274.7	-	-	-	-	-
Bosnia and Herzegovina	2,115	131.7	163.8	163.8	185.1	185.5	-	-	-	-	-
Bulgaria	3,823	121.7	155.9	161.9	172.6	182.8	-	-	-	-	-
Croatia	1,922	167.8	191	202.3	211.6	215.9	10.25	10.29	10.29	10.27	10.28
Cyprus	172.7	46	46.2	48.5	57.4	64.4	-	-	-	-	-
Czech Republic	2,667.4	237.5	264.9	277.7	284	296.6	-	-	-	-	-
Denmark	612.2	123.8	160.2	205	201	204.5	27.21	27.21	22.59	18.94	11.45
Estonia	2,232	178.3	204.4	202	210.5	213.4	32.11	31.78	31.93	31.96	32.21
Finland	22,218	85.9	92.8	98.4	104.4	104.4	6.48	6.39	9.67	9.86	9.86
France	16,989	143.9	147.4	158.4	161.3	168.3	-	-	-	-	-
Georgia	2,822.4	153	161.3	164.4	161	161	22.5	22.19	23.17	23.19	23.19
Germany	11,419	249.1	297.8	307.6	317	320.8	-	-	-	-	-
Greece	3,903	47.3	47.2	47.2	47.4	47.4	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	159.9	170.5	172.1	175.4	182.2	-	-	-	-	-
Iceland	49.1	1.9	3.3	4.6	6.9	10.2	0.22	0.22	0.22	0.23	0.23
Ireland	754	-	-	99.8	124	154.9	-	-	-	-	-
Italy	9,297	112.6	127.6	134	141.7	148.9	-	-	-	-	-
Latvia	3,356	139.3	165.7	168.9	183.1	198.2	16.52	17.07	16.95	16.81	16.96
Liechtenstein	6.2	270.5	286.9	286.9	282.3	282.3	-	-	-	-	-
Lithuania	2,180	212.3	222.5	219	225.7	236.2	30	30.12	30.14	29.76	29.81
Luxembourg	86.8	237.5	299.1	299.1	299.1	299.1	-	-	-	-	-
Malta	0.3	230.5	230.5	230.5	230.5	230.5	-	-	-	-	-
Moldova	409	115	132.7	124.8	123.3	123.3	51.61	51.61	51.52	51.43	51.35
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	115.9	115.9	146.8	146.8	-	12.73	12.73	2.91	2.91
Netherlands	376	151.9	169.7	191.8	203.5	215.2	-	-	-	-	-
Norway	12,112	65	74.1	81.1	88.3	95.5	2.6	3.14	3.41	3.7	3.97
Poland	9,435	167.2	191.6	207.5	254.3	269.2	-	-	-	-	-
Portugal	3,182.1	59.1	59.2	56.1	57.4	-	-	-	-	-	-
Romania	6,861	211.5	211.5	211.5	211.5	281.4	-	-	-	-	54.44
Russian Federation *	809,090	98.9	99.2	99.5	100.8	-	21.36	22.25	22.56	24.25	-
Serbia	2,720	101.6	101.6	120.4	153	153.7	20.91	5.76	5.76	63.41	72.83
Slovakia	1,940	209	241.1	256.1	265.2	274.3	-	-	-	-	-
Slovenia	1,248	230.1	269.9	301	325.7	345.8	60.98	60.53	58.62	60	60.87
Spain	18,417.9	48.1	53.4	59.4	61.4	65.8	0.15	0.17	0.17	0.21	0.23
Sweden	28,073	89.1	96	103	105	106.5	2.36	2.56	2.75	2.22	2.88
Switzerland	1,254	343.2	349.2	346.8	349.8	352.5	-	10.16	10	9.86	9.86
FYROM	987.5	83.7	82.3	78.3	79.6	77.4	-	-	-	-	-
Turkey	11,943	106.1	111.2	113.4	120.3	126.2	7.95	7.68	8.25	7.84	7.31
Ukraine	9,657	152.5	198.1	209.3	219.9	227.4	-	-	-	38.46	38.46
United Kingdom	3,144	131.7	162.5	177.8	194.5	207.4	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 9: Ind 1.2D Growing stock (volume per inhabitant on forest and FAWS). 1990-2015

Country	Forest [1,000 ha]	Growing stock [m³/inhabitant]									
		Forest					Forest available for wood supply				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	22.88	24.41	19.75	18.56	18.75	20.11	19.1	19.05	17.85	18.03
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,869	120.74	133.18	133.94	134.57	136.3	116.7	129.56	130.29	130.64	132.29
Belarus	8,633.5	98.38	133.85	148.48	168.34	176.35	83.52	109.25	121.54	136.95	142.91
Belgium	683.4	12.84	15.35	16.16	16.35	16.77	12.71	15.28	15.31	15.18	15.19
Bosnia and Herzegovina	2,115	64.29	93.37	92.27	101.23	102.44	64.29	93.37	92.27	101.23	102.44
Bulgaria	3,823	46.45	64.38	76.36	87.21	96.21	29.71	39.29	48.84	50.3	67.72
Croatia	1,922	64.92	81.36	86.67	91.97	97.57	61.44	75.13	79.23	83.96	91.42
Cyprus	172.7	9.66	8.41	8.12	8.99	9.75	3.99	3.27	3.03	2.99	3.12
Czech Republic	2,667.4	60.43	68.13	71.99	72.04	75.2	59.42	66.11	68.97	63.76	63.76
Denmark	612.2	13.08	17.57	21.1	21.27	22.3	12.96	17	19.3	19.67	20.61
Estonia	2,232	250.64	328.06	335.85	353.22	359.58	236.24	306.02	305.88	311.31	321.23
Finland	22,218	377.22	402.8	415.74	432.54	426.49	371.01	372.28	382.19	391.44	385.96
France	16,989	35.56	37	39.76	40.74	43.31	33.97	34.79	37.62	38.71	40.85
Georgia	2,822.4	87.71	100.81	104.53	102.07	101.52	18.7	20.54	21.22	21.08	20.96
Germany	11,419	35.44	41.13	42.46	44.23	45.43	32.89	39.24	40.52	42.2	43.32
Greece	3,903	15.36	15.57	15.96	16.59	16.77	14.15	14.34	14.7	15.28	15.41
Holy See	0	0	0	0	0	0	0	0	0	0	0
Hungary	2,069.1	27.76	31.84	33.84	35.9	38.1	24.98	28.52	30.04	31.51	33.41
Iceland	49.1	0.12	0.33	0.56	0.92	1.55	0.05	0.16	0.3	0.54	1.02
Ireland	754	-	-	16.67	19.72	25.42	-	-	14.72	17.82	-
Italy	9,297	15.07	18.75	20.25	21.58	23.14	14	17.41	18.81	20.04	21.49
Latvia	3,356	165.97	226.82	248.79	292.72	330.29	150.57	209.37	230.48	270.54	306
Liechtenstein	6.2	57.4	52.88	50.37	48.45	47.39	45.95	42.28	40.27	38.73	37.89
Lithuania	2,180	111.69	128.45	139.83	158.14	174.21	-	112.01	119.79	131.73	141.4
Luxembourg	86.8	53.37	59.48	55.79	51.19	47.77	-	-	-	-	-
Malta	0.3	0.23	0.21	0.2	0.19	0.19	-	-	-	-	-
Moldova	409	9.93	11.81	12.6	13.36	14.17	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	0	0	0	0
Montenegro	826.8	-	118.78	117.89	195.78	195.37	-	110.77	109.93	169.33	168.98
Netherlands	376	3.5	3.84	4.29	4.57	4.81	2.81	3.07	3.43	3.66	3.85
Norway	12,112	185.78	199.96	212.19	218.64	227.57	171.4	182.81	193.15	196.96	203.18
Poland	9,435	38.97	45.38	50.02	62.12	65.92	-	41.4	45.17	53.11	56.84
Portugal	3,182.1	20.33	19.24	17.61	17.59	-	16.63	15.84	14.47	14.57	-
Romania	6,861	58.08	59.99	63.4	68.05	96.7	51.11	47.39	50.09	53.76	64.79
Russian Federation *	809,090	540.57	547.29	562.12	580.79	-	466.78	475.95	480.24	486.11	-
Serbia	2,720	30.98	33.26	40.05	56.92	58.35	-	28.02	33.73	48	49.2
Slovakia	1,940	75.79	85.96	92.06	95.36	98.28	68.54	81.08	84.74	79.63	81.2
Slovenia	1,248	136.78	167.33	187.01	198.23	209.47	128.25	157	175.36	190.34	191.17
Spain	18,417.9	17.08	22.5	23.53	24.04	25.98	-	-	18.33	18.72	20.24
Sweden	28,073	292.26	304.69	321.93	314.32	311.54	-	-	265.44	257.4	249.12
Switzerland	1,254	58.82	58.04	56.74	55.21	54.69	56.88	56.09	54.86	53.29	52.71
FYROM	987.5	37.96	38.44	36.54	36.35	36.26	32.84	32.16	31.58	31.4	31.32
Turkey	11,943	18.91	17.92	17.85	18.68	20.11	12.95	12.27	12.22	12.8	13.77
Ukraine	9,657	27.25	38.31	42.54	45.78	48.27	13.2	24.54	25.43	30.3	31.61
United Kingdom	3,144	6.39	8.15	8.89	9.48	10.17	6.39	8.15	8.89	9.48	10.17

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 10: Ind 1.2E Growing stock on forest available for wood supply. 1990-2015

Country	Forest [1,000 ha]	Forest available for wood supply								
		Growing stock [Million m³]					Annual change rate			
							1990 2015		2005 2015	
	2015	1990	2000	2005	2010	2015	Million m³/yr	%	Million m³/yr	%
Albania	785	66.1	59	57	50	50	-0.64	-1.1	-0.7	-1.3
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,869	896	1,038	1,072	1,096	1,121	9	0.9	4.9	0.4
Belarus	8,633.5	851	1,093	1,174.4	1,299.7	1,352.8	20.07	1.9	17.84	1.4
Belgium	683.4	126.7	156.6	160.4	165.7	170.1	1.73	1.2	0.97	0.6
Bosnia and Herzegovina	2,115	291	358	358	389.3	392.3	4.05	1.2	3.43	0.9
Bulgaria	3,823	259	321	378	372	492	9.32	2.6	11.4	2.7
Croatia	1,922	293.7	332.5	351.9	370.9	388.8	3.8	1.1	3.68	1
Cyprus	172.7	3.1	3.1	3.1	3.3	3.6	0.02	0.6	0.04	1.3
Czech Republic	2,667.4	614	678	704.3	667.9	670.9	2.28	0.4	-3.34	-0.5
Denmark	612.2	66.6	90.8	104.6	109.1	115.7	1.96	2.2	1.11	1
Estonia	2,232	370.7	427.5	414.4	414.5	425.5	2.19	0.6	1.11	0.3
Finland	22,218	1,850	1,927	2,005	2,099.4	2,099.4	9.98	0.5	9.44	0.5
France	16,989	1,984	2,119	2,377	2,517	2,697	28.52	1.2	32	1.3
Georgia	2,822.4	89.8	90.7	92.5	93.9	93.9	0.16	0.2	0.13	0.1
Germany	11,419	2,612.4	3,225.9	3,341.4	3,451.1	3,492.7	35.21	1.2	15.13	0.4
Greece	3,903	143.7	156.6	163	170.4	170	1.05	0.7	0.7	0.4
Holy See	0	0	0	0	0	0	0	-	0	-
Hungary	2,069.1	259.2	291.3	303	315.1	330.7	2.86	1	2.77	0.9
Iceland	49.1	0.01	0.05	0.1	0.2	0.3	0.01	14.2	0.02	13.8
Ireland	754	-	-	61.2	81.3	-	-	-	-	-
Italy	9,297	794	991.6	1,090.4	1,188.2	1,286	19.68	1.9	19.56	1.7
Latvia	3,356	401	495.7	516	567.5	616.1	8.6	1.7	10.01	1.8
Liechtenstein	6.2	1.3	1.4	1.4	1.4	1.4	0	0.2	0	0
Lithuania	2,180	-	392	398	408	418	-	-	2	0.5
Luxembourg	86.8	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	-	0	-
Montenegro	826.8	-	67.7	67.7	105	105	-	-	3.73	4.5
Netherlands	376	42	48.9	56	60.8	64.7	0.91	1.7	0.87	1.5
Norway	12,112	727	821	893	963	1,033	12.24	1.4	14	1.5
Poland	9,435	-	1,584	1,724	2,028	2,190	-	-	46.6	2.4
Portugal	3,182.1	166	163	152	154	-	-	-	-	-
Romania	6,861	1,185.8	1,063.7	1,067.8	1,088.5	1,293.4	4.3	0.3	22.55	1.9
Russian Federation *	809,090	69,114.1	69,807.2	68,756.1	68,234.2	-	-	-	-	-
Serbia	2,720	-	210.6	251	350	352.5	-	-	10.15	3.5
Slovakia	1,940	363.2	436.9	455.3	429.3	439.6	3.06	0.8	-1.57	-0.4
Slovenia	1,248	256.3	312.3	350.8	389.9	393.9	5.51	1.7	4.31	1.2
Spain	18,417.9	-	-	800.1	872	944	-	-	14.39	1.7
Sweden	28,073	-	-	2,396.8	2,413.9	2,389.7	-	-	-0.71	-0.03
Switzerland	1,254	382	403	408	417	426	1.76	0.4	1.8	0.4
FYROM	987.5	66	66	66	66	66	0	0	0	0
Turkey	11,943	699.4	775.4	828.2	923	1,032.2	13.31	1.6	20.4	2.2
Ukraine	9,657	685	1,207	1,198	1,390	1,438	30.12	3	24	1.8
United Kingdom	3,144	366	480	537	595	652	11.44	2.3	11.5	2

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 11: Ind 1.3A Age-class distribution - total of all even-aged forest stands. 2010

Country	Forest [1,000 ha]	Development phase					Of which: available for wood supply [1,000 ha]					Of which: available for wood supply [1 0 m³]				
		Total	Development phase				Total	Development phase				Total	Development phase			
			Regeneration phase	Intermediate phase	Mature phase	Unspecified		Regeneration phase	Intermediate phase	Mature phase	Unspecified		Regeneration phase	Intermediate phase	Mature phase	Unspecified
Albania	776	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	-	-	1,782	252	1,105	264	159	596,219	4,012	407,582	155,751	28,875
Belarus	8,630	8,630	589	7,177.2	863.8	0	6,478.6	528.2	5,315.2	635.2	0	-	-	-	-	-
Belgium	681.2	494.6	104.9	212.6	53.6	123.5	484.7	99.7	170.6	55.9	158.6	122,984.8	7,488.5	60,485.4	21,714	33,297
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	3,737	1,204	1,553	640	340	2,387	-	-	-	-	372,000	-	-	-	-
Croatia	1,920	1,524	139	1,118	267	0	1,433	136	1,058	239	0	295,752	1,739	222,397	71,616	0
Cyprus	172.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	2,657.4	2,657.4	457	1,709.9	490.3	0.2	2,310.4	391.6	1,520	398.7	0	666,866.3	3,269.8	482,221.8	181,374.7	0
Denmark	587.1	474.5	-	-	-	474.5	455.6	-	-	-	455.6	93,577.9	-	-	-	93,577.9
Estonia	2,233.9	1,752.9	120.7	1,219.2	413	-	1,582.3	118.7	1,110.6	353	-	306,501	1,921	201,011	103,569	-
Finland	22,218	22,218	3,933	12,912	3,422	1,952	19,465	3,846	12,180	2,432	1,007	2,099	76	1,497	503	24
France	16,424	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	564.5	39.5	271	254	-	117.5	8.2	56.4	52.9	-	18.2	1.3	8.7	8.2	-
Germany	11,409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	1,621.2	171.1	1,235.3	214.8	0	1,462.3	163.6	1,118.2	180.5	0	277,258.4	7,123.2	225,788.7	44,346.4	0
Iceland	42.7	32	25.7	6.2	0.2	0	20.8	16.7	4	0.1	0	170.7	10.7	154.3	5.7	0
Ireland	725.6	580.2	194.3	327.9	58	0	539.4	169.3	316.1	53.9	0	69,856.7	1,438.8	49,281.6	19,007.3	0
Italy	9,028	5,348	-	3,969.3	-	594	4,726.8	-	3,508	-	525	-	-	526,141.5	-	77,180.5
Latvia	3,354	3,354	721.9	1,722.3	909.8	-	3,149	724.6	1,621.3	803.1	-	567.5	0.2	313.3	253.9	0
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	2,170	368	1,308	381	113	1,852	352	1,053	373	74	408	20	275	113	0
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	625.7	439.9	120.5	65.2	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	302.3	34.7	54.4	213.1	0	241.8	27.8	43.6	170.5	0	48,716.8	1,934.4	7,926.5	38,855.9	0
Norway	12,102	4,827	1,646	1,594	1,586	0	4,725	1,632	1,580	1,514	0	530,347	46,815	255,852	227,680	0
Poland	9,329	9,329	1,397	6,297	1,635	0	8,128	1,254	5,594	1,280	0	2,028,000	43,000	1,514,000	471,000	0
Portugal	3,239.1	1,927	543.9	430.9	951.7	0.7	1,575.6	456.8	408.4	710.1	0.4	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809090	809090	-	-	-	-	677203,7	-	-	-	-	-	-	-		-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	1,939	151.1	1,466.6	311.6	9.7	1,779	145.6	1,231.2	392.5	9.7	439,600	98.1	281,910.8	157,591.1	0
Slovenia	1,247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	18,247.2	1,936.9	723.2	703.5	510.1	0	1,936.9	723.2	703.5	510.1	0	141,135	3,070.1	43,002.5	95,062.4	0
Sweden	28,073	18,354.4	2,420.8	11,547.2	4,386.3	0	16,061.9	2,133.6	10,167.9	3,760.4	0	1,838,027.8	29,451.8	917,431.2	891,144.9	0
Switzerland	1,235	-	-	-	-	-	897	87	627	183	0	324,329	7,936	207,523	108,870	0
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	9,297	1,459	5,663	2,175	0	5,004	1,017	2,934	1,053	0	2,404	87	956	1,361	0
United Kingdom	3,059	1,648	146	915	344	243	1,648	146	915	344	243	353,713	49	208,900	144,764	0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 12: Ind 1.3B Diameter distribution of all uneven-aged forest. 1990-2010

Country	Forest [1,000 ha]	Forest: uneven-aged stands [1,000 m³ o.b.]															
		<20 cm				21-40 cm				41-60 cm				>60 cm			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	-	-	27,000	-	-	-	15,600	-	-	-	9,400	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	-	2,554.2	3,053.1	3,620.1	-	13,428.6	14,214.9	15,178.1	-	14,291.5	14,829.7	15,527	-	6,997.7	8,065.5	9,290
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croatia	1,920	8,057	6,820	6,234	6,168	37,304	35,006	33,875	35,636	34,588	34,319	34,129	36,883	20,516	19,409	18,860	19,923
Cyprus	172.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	587.1	-	-	2,710.9	3,313	-	-	6,354.1	7,318	-	-	3,229.8	4,194.2	-	-	2,690.9	3,465.1
Estonia	2,233.9	26,036	28,482	27,370	27,364	87,723	101,775	100,825	103,994	2,766	5,504	6,577	7,936	162	210	220	238
Finland	22,218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
France	16,424	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	7,286	9,154.1	8,336.9	10,706.9	21,376.6	26,332.2	26,884.1	30,041.9	1,093.3	2,661.8	3,268.6	3,886.4	56.5	65.5	126.6	152.5
Iceland	42.7	23.7	25.3	26.1	27	6.8	7.3	7.5	7.8	0	0	0	0	0	0	0	0
Ireland	725.6	-	-	5,369.7	5,103	-	-	6,777.4	6,708.3	-	-	2,607.7	2,806.9	-	-	2,691.7	2,957.2
Italy	9,028	30,015.8	36,060.6	39,083	42,105.4	90,407.8	121,624	137,232.1	152,840.2	59,613.7	91,331	107,189.7	123,048.3	23,126.9	30,710	34,501.6	38,293.1
Latvia	3,354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	3,088	-	-	-	9,197	-	-	-	8,131	-	-	-	4,955
Netherlands	373.5	-	-	1,812.9	2,590.4	-	-	4,302.6	6,725.4	-	-	2,271.6	4,103.5	-	-	1,049.5	1,685.3
Norway	12,102	-	-	-	238,501	-	-	-	239,389	-	-	-	47,073	-	-	-	2,937
Poland	9,329	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	4,368	-	-	-	7,365	-	-	-	5,290	-	-	-	4,029
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovenia	1,247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	18,247.2	-	-	261,221.9	284,710.8	-	-	426,394.6	464,735.8	-	-	152,384.5	166,086.8	-	-	57,739.2	62,931.1
Sweden	28,073	-	-	340,322.9	349,928.2	-	-	585,844.2	627,018.2	-	-	99,303.5	119,647.3	-	-	7,380.8	13,078.6
Switzerland	1,235	3,750	5,014	5,641	7,110	16,504	22,189	25,010	34,640	18,575	22,607	24,598	36,744	7,599	10,862	12,483	17,051
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	15	16	12	10	20	32	36	41	8	9	10	11	0	0	0	0
United Kingdom	3,059	-	-	-	49,203	-	-	-	84,605	-	-	-	59,237	-	-	-	47,794

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 13: Ind 1.4A Carbon stock on forest and other wooded land. 2015

Country	Forest [1,000 ha]	Forest [million metric tonnes]					Other wooded land [million metric tonnes]				
		Biomass		Deadwood	Litter	Soil	Biomass		Deadwood	Litter	Soil
		Above-ground	Below-ground				Above-ground	Below-ground			
Albania	785	37	11.8	-	11.7	67.9	3.9	11	-	4.1	23.2
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,869	312	79	7	-	-	2	0.5	-	-	-
Belarus	8,633.5	475.8	143.3	3.1	253.1	524	-	-	-	-	-
Belgium	683.4	60.01	12.31	2.26	5.69	63.52	-	-	-	-	-
Bosnia and Herzegovina	2,115	95.08	22.8	-	-	-	-	-	-	-	-
Bulgaria	3,823	166.8	46.1	-	8.1	363	-	-	-	-	2.1
Croatia	1,922	111.9	33.47	-	-	-	8.25	3.79	-	-	-
Cyprus	172.7	2.9	0.93	-	-	3.89	-	-	-	-	4.8
Czech Republic	2,667.4	308.75	57.45	16.85	17.19	170.71	0	0	0	0	0
Denmark	612.2	34.23	6.76	0.69	7.8	103.01	0.17	0.04	0.02	0.44	9.46
Estonia	2,232	133.65	31.47	6.13	-	348.07	2.48	1.09	0.71	-	34.86
Finland	22,218	596.51	183.61	16.51	251.34	4,055.84	1.91	0.69	0.44	10.79	478.19
France	16,989	1,056	308	-	-	-	-	-	-	-	-
Georgia	2,822.4	168.4	43.9	-	53.6	191.1	-	-	-	-	-
Germany	11,419	1,027	162	29	197	765	0	0	0	0	0
Greece	3,903	62	17	-	-	-	-	-	-	-	-
Holy See	0	0	0	0	0	0	0	0	0	0	0
Hungary	2,069.1	97.62	24.41	4.5	-	-	-	-	-	-	-
Iceland	49.1	0.5	0.14	-	0.24	4.16	1.05	0.27	-	0.62	12.22
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	514	127	29	30	760	36.13	8.56	-	-	127.05
Latvia	3,356	216.2	69.2	23.2	71.15	248.76	0.62	0.2	0	2.37	6.73
Liechtenstein	6.2	0.7	-	0.02	-	0.6	-	-	-	-	-
Lithuania	2,180	135.6	31.2	10.9	52.2	157	0.8	0.2	0.05	2.5	7.5
Luxembourg	86.8	8.21	1.15	-	1.68	7.4	-	-	-	-	-
Malta	0.3	0.05	0.01	-	-	-	0	0	0	0	0
Moldova	409	24.91	5.7	-	-	-	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	0	0	0	0
Montenegro	826.8	48.43	8	4.16	-	-	0.17	0.02	0.01	-	-
Netherlands	376	26.9	5.4	2	9	40.5	0	0	0	0	0
Norway	12,112	372	104	-	-	-	2.6	0.9	-	-	-
Poland	9,435	685	137	32	-	-	-	-	-	-	-
Portugal	3,182.1	-	-	-	-	-	-	-	-	-	-
Romania	6,861	517.94	98.42	1.5	154.7	608.48	1.7	0.4	0	2	-
Serbia	809,090	26,000	6,500	7,400	9,600	78,000	250	120	125	125	2,000
Slovakia	2,720	185.3	51.6	33.4	43.5	258.4	9.5	1.2	0.9	8.1	48.3
Slovenia	1,940	179.3	38.9	15.3	23.1	270.5	-	-	-	-	-
Spain	1,248	114.7	26.1	5.6	13	128.9	0.4	0.2	0	0.1	2.4
Sweden	18,417.9	458.08	151.45	-	-	574.89	-	-	-	-	-
Switzerland	28,073	835.6	278.7	29.7	629.7	1,901.1	2.8	0.9	0.3	54.5	164.7
FYROM	1,254	120	32	8	21	100	0.18	0.07	0.01	1.17	5.6
Turkey	987.5	47.9	12.5	0.44	-	-	-	-	-	-	-
Ukraine	11,943	638.62	169.63	6.39	221.9	398.31	107.73	45.42	1.08	42.86	344.42
United Kingdom	9,657	640	143	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 14: Ind 1.4B Carbon stock on forest. 1990-2015

Country	Forest (1,000 ha)	Forest (million metric tonnes)														
		Biomass					Deadwood					Soil and litter				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	49.2	49.3	48.3	48.8	48.8	-	-	-	-	-	80.9	78.8	80.6	79.6	79.6
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,869	335	368	378	384	391	3	4	5	6	7	463	-	-	585	-
Belarus	8,633.5	385.6	481.6	540.4	610.7	619.1	1.9	2.7	2.9	3.1	3.1	683.1	726.9	741.1	758.3	777.1
Belgium	683.4	50.35	59.73	64.48	68.39	72.32	1.38	1.4	1.4	1.83	2.26	60.07	62.53	64.88	67.27	69.21
Bosnia and Herzegovina	2,115	95.85	117.88	117.88	117.88	117.88	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	126.6	161.2	181.9	197.4	212.9	-	-	-	-	-	322.5	327.4	353.9	362.5	371.1
Croatia	1,922	107.9	125.93	134.95	142.38	145.37	-	-	-	-	-	-	-	-	-	-
Cyprus	172.7	2.55	2.73	2.89	3.42	3.83	-	-	-	-	-	3.63	3.86	3.89	3.89	3.89
Czech Republic	2,667.4	287.17	322.5	339.56	348.92	366.2	16.61	16.66	16.72	16.79	16.85	181.85	183.97	185.41	186.47	187.91
Denmark	612.2	34.03	36.75	36.54	38.69	40.99	0.47	0.53	0.59	0.65	0.69	99.11	105.91	108.67	112.87	110.81
Estonia	2,232	141.03	158.27	156.89	163.18	165.12	2.87	3.23	4.02	5.31	6.13	344.01	349.74	351.22	348.39	348.07
Finland	22,218	632.96	715.52	744.94	780.12	780.12	15.11	15.09	16.57	16.51	16.51	4,284.41	4,311.26	4,308.43	4,307.18	4,307.18
France	16,989	965	1,049	1,165	1,247	1,364	-	-	-	-	-	1,148	1,212	1,242	1,258	-
Georgia	2,822.4	-	202.7	207.5	212.3	212.3	-	-	-	-	-	-	244.7	244.7	244.7	244.7
Germany	11,419	871	1,043	1,085	1,121	1,189	-	25	30	32	29	870	907	925	943	962
Greece	3,903	67	73	76	79	79	-	-	-	-	-	-	-	-	-	-
Holy See	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	2,069.1	95.54	107.12	110.57	117.18	122.03	-	-	-	4.13	4.5	-	-	-	-	-
Iceland	49.1	0.16	0.22	0.29	0.39	0.64	-	-	-	-	-	1.43	2.58	3.27	3.83	4.4
Ireland	754	24.5	33.51	37.31	48.55	-	0.83	1.06	1.25	2.47	-	215	283.58	306.94	326.55	-
Italy	9,297	400	496	545	593	641	18	23	25	27	29	644	711	744	767	790
Latvia	3,356	189.7	230.5	239.1	263.5	285.4	5.1	5.4	16.1	16.8	23.2	297.35	304	309.37	317.83	319.91
Liechtenstein	6.2	-	0.7	0.7	0.7	0.7	-	0.02	0.02	0.02	0.02	-	0.6	0.6	0.6	0.6
Lithuania	2,180	134.1	145.6	150.8	158.7	166.8	9.8	10.2	10.6	10.9	10.9	186.7	193.9	203.6	208.3	209.2
Luxembourg	86.8	7.35	9.36	9.36	9.36	9.36	-	-	-	-	-	8.97	9.08	9.08	9.08	9.08
Malta	0.3	0.06	0.06	0.06	0.06	0.06	-	-	-	-	-	-	-	-	-	-
Moldova	409	22.27	26.09	27.5	28.9	30.61	-	-	-	-	-	-	-	-	-	-
Monaco	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Montenegro	826.8	-	33.35	33.35	56.43	56.43	-	2.4	2.4	4.16	4.16	-	-	-	-	-
Netherlands	376	20.5	24	25.2	28.9	32.3	0.5	0.6	1.4	1.7	2	46	48	49	49.5	49.5
Norway	12,112	332	377	409	443	476	-	-	-	-	-	-	-	-	-	-
Poland	9,435	467	546	600	767	822	-	-	-	32	32	-	-	-	822	-
Portugal	3,182.1	-	-	101.79	102.45	-	-	-	-	-	-	-	-	-	-	-
Romania	6,861	382.86	382.58	384.08	391.27	616.36	-	-	-	-	1.5	722.57	721.86	724.72	738.55	763.18
Russian Federation *	809,090	32,504	32,157	32,210	32,500	-	7,317	7,228	7,198	7,400	-	87,600	87,500	87,500	87,600	-
Serbia	2,720	122	138.2	146.7	235.1	236.9	17.1	19.4	20.5	33.1	33.4	258.7	273.1	274.8	301.1	301.9
Slovakia	1,940	162.7	189.8	202.4	211.2	218.2	12.5	14.5	15.3	15.3	15.3	287.2	290	290.9	292.9	293.6
Slovenia	1,248	88.4	107.2	121.4	132.2	140.8	7.2	8.8	10.2	5.6	5.6	123.7	128.4	129.4	129.8	141.9
Spain	18,417.9	324.92	453.6	517.94	563.73	609.53	-	-	-	-	-	-	-	-	569.56	574.89
Sweden	28,073	950.3	1,016	1,091.4	1,102.8	1,114.3	19.9	21.1	27.3	28.5	29.7	2,459	2,484	2,513.9	2,510	2,530.8
Switzerland	1,254	136	142	144	150	152	-	7	7	8	8	111	115	117	120	121
FYROM	987.5	60.1	62.1	60.4	60.4	60.4	-	0.11	0.08	0.44	0.44	-	-	-	-	-
Turkey	11,943	545.53	604.1	644.88	719.79	808.25	4.31	4.77	5.09	5.68	6.39	509.85	539.57	564.95	593.1	620.21
Ukraine	9,657	499	662	711.5	758	783	3.5	4.5	4.8	27	-	280.9	288.1	289.1	290	-
United Kingdom	3,144	133	175	196	216	237	2	3	3	3	3	690	739	757	767	791

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 15: Ind 1.2. Area of damage to forests and other wooded land by different damaging agents. 2010

Country	Forest [1,000 ha]	Total area of forest with damage [1,000 ha]	Forest [1,000 ha]								Total area of OWL with damage [1,000 ha]	Other wooded land [1,000 ha]							
			Biotic agents		Abiotic agents	Human induced		Primarily damaged by fire		Unspecified/ Mixed damage		Biotic agents		Abiotic agents	Human induced		Primarily damaged by fire		Unspecified/ Mixed damage
			Insects & disease	Wildlife & grazing	Storm. wind. snow. etc.	Forest operations	Other	Total	Of which human induced			Insects & disease	Wildlife & grazing	Storm. wind. snow. etc.	Forest operations	Other	Total	Of which human induced	
Albania	776	-	0	262	0	0	-	1.1	-	-	-	-	-	-	-	-	2	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belarus	8,630	211	169	0	12	30	0	0	0	0	-	-	-	-	-	-	-	-	-
Belgium	681.2	46.79	17.1	26.33	2	1.33	0	0.02	-	0	-	-	-	-	-	-	0.4	-	0
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	2.5	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	134.3	117	0.2	4.3	0	0.7	5.9	5.6	6.2	-	-	-	-	-	-	0.6	-	-
Croatia	1,920	144.26	88.23	0.7	54.9	-	-	0.43	0.19	-	0.68	-	-	-	-	-	0.68	0.29	-
Cyprus	172.8	5.41	1.23	3.9	0	0	0	0.28	0.28	0	-	-	-	0	-	0	1.28	1.28	0
Czech Republic	2,657.4	73.7	56.56	1.32	15.62	-	-	0.21	-	-	0	0	0	0	0	0	0	0	0
Denmark	587.1	11.65	6.25	2.06	2.51	0	0.73	0	0	0.11	0	0	0	0	0	0	0	0	0
Estonia	2,233.9	-	4	1.22	6.59	0.01	0.16	0.28	-	-	-	-	-	-	-	-	-	-	-
Finland	22,218	62	10.2	16.3	20.8	0	1.5	5	5	13.1	0	0	0	0	0	0	0	0	0
France	16,424	-	26	-	408	-	-	18	-	-	-	-	-	-	-	-	27	-	-
Georgia	2,822.4	-	26.27	-	-	-	-	371.1	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	143.86	12.91	4.91	-	-	0.52	0.09	0	0	0	0	0	0	0	0	0	0
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	0	-	-	-	0	0	0	-	-	0	-	-	-	0	0	0
Hungary	2,046.4	130	71.84	19.3	38.1	-	-	0.76	-	-	-	-	-	-	-	-	-	-	-
Iceland	42.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	725.6	-	-	24.88	8.01	-	-	1.48	-	-	-	-	-	-	-	-	-	-	-
Italy	9,028	-	-	-	-	-	-	16.35	16.35	-	-	-	-	-	-	-	3	3	-
Latvia	3,354	4.87	0.65	0.06	4.11	0	0	0.03	-	0.02	0	0	0	0	0	0	0	0	0
Liechtenstein	6.2	-	0	1.6	-	-	-	0	0	-	-	-	-	-	-	-	0	0	-
Lithuania	2,170	50.75	22.6	7.9	20.1	0	0	0.15	-	0	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	0	0	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	-	-	0.04	-	-	0	0	0	0	0	0	0	0	0
Norway	12,102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	9,329	206	70	46	10	7	1	6	-	66	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	336	290	-	-	-	-	46	-	-	87	-	-	-	-	-	87	-	-
Romania	6,515	879.61	78	577	1.4	215	2	0.21	-	6	-	1	16	0	2	0	-	-	0
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	20	-	0	-	-	0.7	-	-	-	-	-	-	-	-	0.3	-	-
Slovakia	1,938.9	25.2	14.2	0.2	8.4	-	0.7	1.7	1.5	0	0	0	0	0	-	0	0	0	0
Slovenia	1,247	1.49	0.54	0.01	0.33	0.08	0	0.41	-	0.12	-	-	-	-	-	-	-	-	-
Spain	18,247.2	-	-	-	61.9	-	-	10.19	8.92	-	-	-	-	-	-	-	44.59	42.39	-
Sweden	28,073	893.05	275.48	407.45	122.4	45.84	0	0.5	-	45.91	-	-	-	-	-	-	-	-	-
Switzerland	1,235	-	-	0	6.43	0	0	0.02	-	-	-	-	-	0.2	-	-	-	-	-
FYROM	960.4	-	3.51	-	1.74	-	-	3.28	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	440.5	438.4	-	-	-	-	2.1	-	-	1.2	-	-	-	-	-	1.2	-	-
Ukraine	9,548	17.8	6.4	-	8	0	0.7	2.7	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 16: Ind 2.4 Area of damage to forests by selected type of damage. 1990-2010

Country	Forest (1,000 ha)	Forest (1,000 ha)															
		Insects & disease				Wildlife & grazing				Storm, wind, snow, etc.				Forest operations			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	0	0	0	222.9	141	148	262	-	0	0	0	-	0	0	0
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belarus	8,630	-	244	205	169	-	0	0	0	-	1	8	12	-	19	24	30
Belgium	681.2	-	45.1	46.1	17.1	-	40.3	35.3	26.33	-	2.6	2.1	2	-	6.6	4.8	1.33
Bosnia and Herzegovina	2,102.7	3.75	11.19	-	-	-	-	-	-	1.12	1.13	-	-	-	-	-	-
Bulgaria	3,737	163	181	131.4	117	0.4	0.3	1	0.2	8.6	33.8	10.7	4.3	0	0	0	0
Croatia	1,920	-	22.44	37.6	88.23	-	19.79	8.24	0.7	-	25.4	19.06	54.9	-	-	-	-
Cyprus	172.8	-	-	6.3	1.23	-	-	3.8	3.9	0	0	0	0	-	-	0	0
Czech Republic	2,657.4	27	32.83	57.23	56.56	-	1.73	1.63	1.32	23.1	10.85	10.21	15.62	-	-	-	-
Denmark	587.1	-	-	3.53	6.25	-	-	4.49	2.06	-	20	2.51	2.51	-	-	0	0
Estonia	2,233.9	-	-	5.2	4	32.47	6.52	1.96	1.22	-	6.98	11.15	6.59	-	-	0.01	0.01
Finland	22,218	-	-	-	10.2	-	-	-	16.3	-	-	-	20.8	-	-	-	0
France	16,424	-	-	-	26	-	-	-	-	-	-	-	408	-	-	-	-
Georgia	2,822.4	-	-	5.83	26.27	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	120.97	193.33	143.86	-	33.83	15.08	12.91	-	3.69	27.5	4.91	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	87.42	84.8	179.9	71.84	26.14	23.76	35.54	19.3	18.28	21.1	29.9	38.1	-	-	-	-
Iceland	42.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	725.6	-	-	-	-	-	-	-	24.88	-	-	-	8.01	-	-	-	-
Italy	9,028	-	-	850.08	-	-	-	395.64	-	-	-	535.08	-	-	-	29.4	-
Latvia	3,354	0.33	0.55	0.18	0.65	0.24	0.22	0.03	0.06	0.36	1.1	18.85	4.11	0	0	0	0
Liechtenstein	6.2	0.1	0	0	0	-	1.7	1.7	1.6	-	-	-	-	-	-	-	-
Lithuania	2,170	19	44.7	52.2	22.6	25.3	17.4	12.2	7.9	37.1	58.7	37.8	20.1	0	0	0	0
Luxembourg	86.8	-	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	79.5	71.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	12,102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	9,329	-	-	-	70	-	-	-	46	-	-	-	10	-	-	-	7
Portugal	3,239.1	452.8	259.8	275	290	26.9	15.4	44.4	-	36.5	20.9	51.2	-	-	-	-	-
Romania	6,515	1,833	1,291	1,322	78	26	13	10	577	151.5	136.5	230.9	1.4	-	-	-	215
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	1	85	118	20	1	0	0	-	0	0	0	0	-	-	-	-
Slovakia	1,938.9	25.6	15.2	12.3	14.2	1.3	0.8	1	0.2	4.8	6	10.9	8.4	-	-	-	-
Slovenia	1,247	-	0.46	0.99	0.54	-	0.02	0.01	0.01	-	0.49	0.39	0.33	-	0.11	0.08	0.08
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-	-	61.9	-	-	-	-
Sweden	28,073	94.64	191	192.41	275.48	320.37	424.15	456.45	407.45	239.71	196.59	1,100.26	122.4	16.51	18.18	36.45	45.84
Switzerland	1,235	-	-	-	-	-	0	0	0	-	14.07	10.25	6.43	-	0	0	0
FYROM	960.4	27.2	58.3	47.3	3.51	-	-	-	-	-	-	-	1.74	-	-	-	-
Turkey	11,202.8	250	333	184	438.4	-	-	-	-	-	34	11	-	-	-	-	-
Ukraine	9,548	0.4	1.7	4.3	6.4	-	-	-	-	2	6.4	7.7	8	0	0	0	0
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 16: Ind 2.4 Area of damage to forests by selected type of damage. 1990-2010 (cont.)

Country	Forest (1,000 ha)	Forest (1,000 ha)															
		Human induced: Other				Fires: Total				Fires: Human induced				Unspecified / Mixed damage			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	-	-	-	-	3.7	6.2	1.1	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belarus	8,630	-	0	0	0	-	6	1	0	-	6	1	0	-	0	0	0
Belgium	681.2	-	0	0	0	0.02	0.01	0	0.02	-	-	-	-	0	0	0	0
Bosnia and Herzegovina	2,102.7	-	-	-	-	1.12	12.5	1.2	2.5	-	-	-	-	-	-	-	-
Bulgaria	3,737	0.1	0	0	0.7	1.01	45.4	1.4	5.9	-	15.4	0.63	5.6	0.11	0	0.5	6.2
Croatia	1,920	-	-	-	-	1.25	5.77	6.55	0.43	-	-	-	0.19	-	-	-	-
Cyprus	172.8	0	0	0	0	0.01	2.14	0.06	0.28	0.01	2.14	0.06	0.28	0	0	0	0
Czech Republic	2,657.4	-	-	-	-	0.7	0.38	0.23	0.21	-	-	-	-	-	-	-	-
Denmark	587.1	-	-	3.5	0.73	-	-	0	0	-	-	0	0	-	-	0.11	0.11
Estonia	2,233.9	-	-	1.54	0.16	0.44	0.8	0.81	0.28	-	-	-	-	-	-	-	-
Finland	22,218	-	-	-	1.5	-	-	-	5	-	-	-	5	-	-	-	13.1
France	16,424	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	85	44.8	371.1	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	1	0.58	0.18	0.52	0.21	0.16	0.13	0.09	0	0	0	0
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	2,046.4	-	-	-	-	-	1.2	1.8	0.76	-	-	-	-	-	-	-	-
Iceland	42.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	725.6	-	-	-	-	0.39	0.32	0.12	1.48	-	-	-	-	-	-	-	-
Italy	9,028	-	-	99.12	-	82	48.91	18.47	16.35	82	48.91	18.47	16.35	-	-	-	-
Latvia	3,354	0	0	0	0	0.03	0.12	0.04	0.03	-	-	-	-	0.01	0	0.03	0.02
Liechtenstein	6.2	-	-	-	-	0	0	0	0	0	0	0	0	-	-	-	-
Lithuania	2,170	0	0	0	0	0.25	0.35	0.4	0.15	-	-	-	-	0	0	0	0
Luxembourg	86.8	-	-	-	-	0	0	0	0	0	0	0	0	-	-	-	-
Malta	0.3	-	-	-	-	0	0.01	0	-	0	-	0	-	-	-	-	-
Moldova	386	-	-	-	-	0.04	0.03	0.16	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	0.04	0.29	0.1	0.04	-	-	-	-	-	-	-	-
Norway	12,102	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	9,329	-	-	-	1	-	-	-	6	-	-	-	-	-	-	-	66
Portugal	3,239.1	-	-	-	-	80	69	214	46	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	2	0.44	3.61	0.16	0.21	-	-	-	-	-	-	-	6
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	0.3	1.8	0	0.7	-	-	-	-	-	-	-	-
Slovakia	1,938.9	5.1	9.9	4.4	0.7	0.5	0.5	0.5	1.7	-	0.4	0.3	1.5	-	0	0	0
Slovenia	1,247	-	0.11	0.11	0	0.37	0.3	0.59	0.41	-	-	-	-	-	-	-	0.12
Spain	18,247.2	-	-	-	-	73.2	45.9	69.4	10.19	57.94	37.42	59.87	8.92	-	-	-	-
Sweden	28,073	2.78	0	12.39	0	-	0.6	1.2	0.5	-	-	-	-	89.57	70.19	30.37	45.91
Switzerland	1,235	-	0	0	0	0.3	0.1	0.04	0.02	-	-	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	5.76	37.92	4.02	3.28	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	13.1	7.9	1.9	2.1	-	-	-	-	-	-	-	-
Ukraine	9,548	0.3	0.1	0	0.7	2.4	1.6	5.3	2.7	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 17: Ind 3.1 Increment and fellings on forest available for wood supply. 1990-2010

Country	Forest [1,000 ha]	Net annual increment (over bark)							
		[1,000 m³]				[m3/ha FAWS]			
	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	835	874.6	470.4	223.6	1.2	1.4	0.8	0.4
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	23,799	28,918	25,136	25,136	7.2	8.7	7.5	7.5
Belarus	8,630	19,970	22,980	23,470	25,670	3.4	3.6	3.7	4
Belgium	681.2	4,878.1	4,582.9	4,606.5	4,609.7	7.2	6.9	6.9	6.9
Bosnia and Herzegovina	2,102.7	5,480	5,480	5,480	-	-	-	-	-
Bulgaria	3,737	11,239	13,563	14,120	14,361	4.8	6	5.5	6
Croatia	1,920	7,502	8,062	8,342	8,144	4.3	4.6	4.8	4.7
Cyprus	172.8	46.5	42	40	46.9	1.1	1	1	1.1
Czech Republic	2,657.4	18,776.7	20,923.8	21,566.3	20,463	7.3	8.2	8.6	8.9
Denmark	587.1	4,254.3	4,702	4,194.3	6,263.4	7.9	8.3	7.9	11.3
Estonia	2,233.9	10,530	11,768	11,361	11,514	5.1	5.6	5.5	5.7
Finland	22,218	73,607	80,335	89,587	93,379.2	3.6	4	4.5	4.8
France	16,424	-	-	75,236	82,871	-	-	5	5.3
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	-	118,760.6	118,612	118,589.6	-	11	10.9	10.9
Greece	3,903	3,813	-	-	-	1.3	-	-	-
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	9,982.7	8,344.3	9,747.3	9,774.7	6.5	5.1	5.8	5.7
Iceland	42.7	3.4	6.1	12.7	23.8	0.7	0.5	0.7	1.1
Ireland	725.6	-	-	-	6,677.6	-	-	-	11
Italy	9,028	27,779	30,162	31,352	32,543	4.1	4.1	4.1	4.1
Latvia	3,354	16,500	16,500	-	19,680	5.8	5.5	-	6.2
Liechtenstein	6.2	25	25	25	25	6.9	6.3	6.3	6.3
Lithuania	2,170	-	-	11,460	11,030	-	-	6.2	6
Luxembourg	86.8	650	650	650	650	7.6	7.5	7.5	7.5
Malta	0.3	-	-	-	-	-	-	-	-
Moldova	386	1,129.9	1,327.2	1,397.6	1,462.3	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	1,115.2	1,115.2	2,020.2	-	2	2	3
Netherlands	373.5	2,204	2,226.9	2,737.5	2,738	8	7.7	9.3	9.2
Norway	12,102	23,172	26,159	27,395	25,750	2.7	3.1	3.3	3.1
Poland	9,329	-	-	-	62,300	-	-	-	7.7
Portugal	3,239.1	18,564	19,054	18,870	-	8.2	8.5	8.6	-
Romania	6,515	31,874.3	28,591.1	28,703.6	29,260	5.7	5.7	5.7	5.7
Russian Federation *	809,090	832,700	841,050	848,841	852,927	1.2	1.2	1.2	1.3
Serbia	2,713	5,643	5,232	5,232	-	-	-	-	-
Slovakia	1,938.9	10,155	11,748	12,916	13,465	5.7	6.6	7.4	7.6
Slovenia	1,247	6,023	7,339	8,245	9,165	5.4	6.3	7.1	-
Spain	18,247.2	28,700.7	32,089.9	33,784.4	35,479	-	-	2.4	2.4
Sweden	28,073	-	-	74,159.7	79,346.9	-	-	3.7	4
Switzerland	1,235	-	7,756	8,379	9,001	-	6.7	7.1	7.5
FYROM	960.4	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	32,772.8	35,664.4	-	-	3.8	4.6
Ukraine	9,548	42,200	43,300	44,200	45,000	10.1	7.2	7.8	8.8
United Kingdom	3,059	19,282	21,070	21,962	23,113	6.9	7.1	7.3	7.6

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 17: Ind 3.1 Increment and fellings on forest available for wood supply. 1990-2010 (cont.)

Country	Forest [1,000 ha]	Fellings								Fellings as percent of net annual increment [%]			
		[1,000 m³]				[m³/ha FAWS]							
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	1,950	2,599.5	2,588.7	984.5	2.8	4.2	4.2	1.7	233.5	297.2	550.3	440.3
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	17,925	17,490	23,511	23,511	5.4	5.2	7	7	75.3	60.5	93.5	93.5
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	4,351.6	3,524	4,297.8	3,885.2	6.5	5.3	6.5	5.8	89.2	76.9	93.3	84.3
Bosnia and Herzegovina	2,102.7	-	-	-	5,231.3	-	-	-	-	-	-	-	-
Bulgaria	3,737	3,918	3,755	6,965	6,972	1.7	1.7	2.7	2.9	34.9	27.7	49.3	48.5
Croatia	1,920	4,446	4,267	4,931	5,459	2.5	2.4	2.8	3.1	59.3	52.9	59.1	67
Cyprus	172.8	51.5	24.2	10.4	9.3	1.2	0.6	0.3	0.2	110.8	57.6	26	19.9
Czech Republic	2,657.4	12,776.4	15,824.5	18,212.3	17,435.9	5	6.2	7.2	7.5	68	75.6	84.4	85.2
Denmark	587.1	4,269	4,724.3	4,235.1	3,924.7	7.9	8.3	7.9	7.1	100.3	100.5	101	62.7
Estonia	2,233.9	3,770	12,412	6,662	7,337	1.8	5.9	3.2	3.7	35.8	105.5	58.6	63.7
Finland	22,218	53,321	69,033	69,093	68,174	2.6	3.4	3.4	3.5	72.4	85.9	77.1	73
France	16,424	-	-	-	39,172	-	-	-	2.5	-	-	-	47.3
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	91,175	93,871	95,171.4	-	8.4	8.6	8.7	-	76.8	79.1	80.3
Greece	3,903	3,108.5	2,317.9	1,966.6	1,486.3	1	0.7	0.6	0.4	81.5	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	7,246.2	6,992.4	6,957.2	7,449.8	4.7	4.3	4.1	4.3	72.6	83.8	71.4	76.2
Iceland	42.7	-	0.4	0.8	3.2	-	0.03	0.05	0.1	-	6	6.3	13.3
Ireland	725.6	-	-	-	3,505.9	-	-	-	5.8	-	-	-	52.5
Italy	9,028	13,336.5	14,326.9	13,298.1	12,754.7	2	1.9	1.7	1.6	48	47.5	42.4	39.2
Latvia	3,354	5,299	14,481.4	14,231	12,831	1.9	4.8	4.6	4.1	32.1	87.8	-	65.2
Liechtenstein	6.2	18.4	20.5	26.8	24.4	5.1	5.1	6.7	6.1	73.6	81.9	107.2	97.6
Lithuania	2,170	-	-	10,020	8,640	-	-	5.5	4.7	-	-	87.4	78.3
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	359	396.6	359	-	-	-	-	-	27	28.4	24.6
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	694	570	548.4	502.5	1.3	1	1	0.7	-	51.1	49.2	24.9
Netherlands	373.5	1,278.1	1,354.1	1,314	1,295	4.6	4.7	4.5	4.3	58	60.8	48	47.3
Norway	12,102	13,640	11,151	11,710	12,902	1.6	1.3	1.4	1.5	58.9	42.6	42.7	50.1
Poland	9,329	-	-	-	46,600	-	-	-	5.7	-	-	-	74.8
Portugal	3,239.1	13,852.1	12,649.8	14,228.9	13,347	6.1	5.7	6.5	6.2	74.6	66.4	75.4	-
Romania	6,515	17,225.8	14,087.6	16,473.4	17,600.5	3.1	2.8	3.3	3.4	54	49.3	57.4	60.2
Russian Federation *	809,090	340,000	166,000	186,000	170,000	0.5	0.2	0.3	0.3	40.8	19.7	21.9	19.9
Serbia	2,713	-	2,600	2,700	5,800	-	-	-	-	-	49.7	51.6	-
Slovakia	1,938.9	5,454	6,683	9,146	10,427	3.1	3.8	5.2	5.9	53.7	56.9	70.8	77.4
Slovenia	1,247	2,099	2,547	3,232	3,401	1.9	2.2	2.8	-	34.8	34.7	39.2	37.1
Spain	18,247.2	17,741.2	16,873.4	17,369.1	19,706.5	-	-	1.3	1.4	61.8	52.6	51.4	55.5
Sweden	28,073	-	-	87,700	80,800	-	-	4.3	4	-	-	118.3	101.8
Switzerland	1,235	-	7,361	7,389	7,416	-	6.4	6.3	6.2	-	94.9	88.2	82.4
FYROM	960.4	-	-	-	878.8	-	-	-	1.1	-	-	-	-
Turkey	11,202.8	-	-	17,454.2	13,042.1	-	-	2	1.7	-	-	53.3	36.6
Ukraine	9,548	-	8,352	-	12,827	-	1.4	-	2.5	-	19.3	-	28.5
United Kingdom	3,059	7,890	9,678	10,551	11,683	2.8	3.3	3.5	3.8	40.9	45.9	48	50.5

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 18: Ind 3.2A Quantity and value of total roundwood removals. 1990-2010

Country	Forest (1,000 ha)	Total roundwood															
		Volume (1,000 m³)				Volume (m³/ha FAWS)				Value (million €)				Value (€/ha FAWS)			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	2,346.80	254.83	322.96	303.65	3.43	0.41	0.53	0.52	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	13,214.40	13,941.12	18,092.30	18,614.03	3.99	4.17	5.41	5.57	848.68	871.02	1,125.30	1,265.19	256.56	260.63	336.61	378.69
Belarus	8,630	11,396.00	6,406.18	8,474.50	9,574.08	1.92	1.01	1.33	1.48	-	-	-	-	-	-	-	-
Belgium	681.2	3,816.45	3,347.80	4,082.91	3,690.94	5.67	5.05	6.14	5.53	127.30	104.97	135.58	168.76	189.16	158.32	203.74	252.69
Bosnia and Herzegovina	2,102.7	40.00	4,116.80	3,956.00	3,740.60	-	-	-	-	-	-	-	161.49	-	-	-	-
Bulgaria	3,737	3,785.00	4,238.27	5,784.67	5,863.60	1.60	1.88	2.26	2.46	-	-	-	-	-	-	-	-
Croatia	1,920	-	-	-	5,714.00	-	-	-	3.28	-	-	-	-	-	-	-	-
Cyprus	172.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	2,657.4	11,773.60	14,310.00	16,487.40	15,773.40	4.57	5.59	6.55	6.83	-	-	-	830.23	-	-	-	359.35
Denmark	587.1	1,948.93	2,099.38	2,307.06	2,621.46	3.62	3.71	4.32	4.75	87.41	78.34	75.82	99.26	162.40	138.30	142.10	179.80
Estonia	2,233.9	2,758.23	9,619.84	5,531.70	5,888.95	1.33	4.58	2.67	2.93	-	278.70	184.18	202.65	-	132.56	88.80	100.91
Finland	22,218	41,726.60	53,431.48	53,662.54	48,801.77	2.04	2.63	2.68	2.51	1,711.72	1,874.40	1,973.54	1,940.45	83.71	92.26	98.43	99.69
France	16,424	61,420.00	58,760.00	52,880.00	54,020.00	4.46	4.06	3.48	3.46	2,696.65	2,513.16	2,447.06	2,486.42	195.71	173.74	161.04	159.31
Georgia	2,822.4	-	39.00	0.71	1.05	-	0.07	0.00	0.00	-	-	-	-	-	-	-	-
Germany	11,409	48,575.00	42,451.80	60,330.00	53,267.67	4.63	3.92	5.55	4.89	1,637.14	1,974.10	2,534.97	3,276.91	156.12	182.23	233.38	301.03
Greece	3,903	2,590.40	1,931.55	1,638.83	1,238.58	0.85	0.58	0.47	0.34	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	5,505.41	5,022.10	5,251.31	5,709.48	3.60	3.10	3.12	3.30	160.66	143.86	207.28	263.95	104.96	88,69	123,09	152,64
Iceland	42.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	725.6	1,626.40	2,524.84	2,654.87	2,476.45	-	-	4.58	4.07	-	-	-	-	-	-	-	-
Italy	9,028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	3,354	2,471.00	12,929.78	12,705.98	11,428.99	0.88	4.28	4.11	3.63	-	-	-	-	-	-	-	-
Liechtenstein	6.2	12.00	17.80	23.30	26.31	3.33	4.45	5.83	6.58	-	-	-	-	-	-	-	-
Lithuania	2,170	3,160.00	5,423.60	6,101.00	6,415.20	1.86	3.09	3.32	3.46	-	117.16	183.72	223.15	-	66,72	100,12	120,49
Luxembourg	86.8	-	261.32	268.31	284.88	-	3.01	3.12	3.31	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	326.34	360.52	351.80	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	469.01	417.26	-	-	0.86	0.62	-	-	-	-	-	-	-	-
Netherlands	373.5	1,286.20	962.00	1,061.80	1,030.20	4.66	3.34	3.62	3.45	-	-	-	28.19	-	-	-	94.36
Norway	12,102	11,030.80	9,018.20	9,469.80	10,433.80	1.30	1.07	1.13	1.25	474.25	365.55	388.46	452.09	55.73	43.27	46.28	54.30
Poland	9,329	22,448.20	27,495.20	33,504.40	36,746.60	2.70	3.30	3.98	4.52	-	805.30	1,070.78	1,500.86	-	96.54	127.22	184.65
Portugal	3,239.1	10,367.20	9,209.00	10,583.15	10,210.68	4.56	4.13	4.80	4.76	-	-	-	-	-	-	-	-
Romania	6,515	14,221.20	13,015.74	15,012.20	13,922.95	2.53	2.59	2.97	2.71	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	2,928.50	5,416.25	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	4,584.33	5,809.38	7,779.40	9,073.84	2.59	3.29	4.44	5.10	-	165.37	275.34	385.77	-	93.59	157.25	216.85
Slovenia	1,247	1,671.00	2,198.80	2,787.12	3,063.40	1.50	1.90	2.39	-	-	-	-	-	-	-	-	-
Spain	18,247.2	15,471.00	14,995.00	15,634.00	15,610.28	-	-	1.13	1.07	690.67	688.75	757.46	818.45	-	-	54.87	56.15
Sweden	28,073	53,580.00	62,500.00	75,680.00	69,700.00	2.35	3.01	3.74	3.48	2,362.73	2,394.05	2,501.93	2,801.53	103.49	115.26	123.65	139.85
Switzerland	1,235	5,654.18	6,752.21	6,295.15	5,880.24	5.06	5.85	5.35	4.93	-	-	-	-	-	-	-	-
FYROM	960.4	-	805.60	786.80	644.00	-	1.00	0.98	0.80	-	-	-	-	-	-	-	-
Turkey	11,202.8	16,053.80	16,334.96	16,980.20	20,463.00	1.85	1.89	1.95	2.67	983.24	689.11	698.94	996.65	113.55	79.68	80.21	129.89
Ukraine	9,548	-	9,680.34	15,190.98	16,453.66	-	1.61	2.69	3.21	-	-	-	-	-	-	-	-
United Kingdom	3,059	6,343.20	7,766.20	8,470.60	9,379.60	2.28	2.63	2.80	3.07	317.46	350.17	316.80	334.95	114.28	118.54	104.87	109.50

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 19: Ind 3.2B Quantity and value of marketed roundwood. 1990-2010

Country	Forest [1,000 ha]	Marketed roundwood															
		Volume [1,000 m³]				Volume [m³/ha FAWS]				Value [million €]				Value [€/ha FAWS]			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	11,080.27	11,022.44	14,474.46	15,289.48	3.35	3.3	4.33	4.58	729.48	706.63	920.11	1,067.11	220.52	211.44	275.23	319.4
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	3,816.45	3,347.8	4,082.91	3,690.94	5.67	5.05	6.14	5.53	127.3	104.97	135.58	168.76	189.16	158.32	203.74	252.69
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	3,785	4,238.27	5,784.67	5,863.6	1.6	1.88	2.26	2.46	-	-	-	-	-	-	-	-
Croatia	1,920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	172.8	57.26	25.22	11.76	11.67	1.32	0.58	0.28	0.28	0.68	0.44	0.31	0.43	15.62	10.13	7.41	10.32
Czech Republic	2,657.4	11,773.6	14,310	16,487.4	15,773.4	4.57	5.59	6.55	6.83	-	-	-	830.23	-	-	-	359.35
Denmark	587.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	2,233.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	22,218	39,299.55	50,058.69	49,646.66	44,866.55	1.92	2.46	2.48	2.3	1,639.74	1,796.4	1,882.25	1,833.38	80.19	88.42	93.87	94.19
France	16,424	32,520	34,620	30,660	31,840	2.36	2.39	2.02	2.04	1,546.7	1,595.2	1,595.2	1,607.2	112.25	110.28	104.98	102.98
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	48,575	42,451.8	60,330	53,267.67	4.63	3.92	5.55	4.89	1,637.14	1,974.1	2,534.97	3,276.91	156.12	182.23	233.38	301.03
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	42.7	-	0.29	0.63	2.52	-	0.02	0.04	0.12	-	0.08	0.22	0.24	-	6.56	12.32	11.17
Ireland	725.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	9,028	8,494.6	9,125.4	8,470.1	8,016.03	1.27	1.23	1.09	1	454.16	443.84	437.12	594	67.71	60.01	56.47	74.45
Latvia	3,354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	1,286.2	962	1,061.8	1,030.2	4.66	3.34	3.62	3.45	-	-	-	28.19	-	-	-	94.36
Norway	12,102	10,252.4	8,240	8,691.8	9,655.4	1.2	0.98	1.04	1.16	439.78	332.16	354.69	417.82	51.68	39.32	42.26	50.18
Poland	9,329	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	14,221.2	13,015.74	15,012.2	13,922.95	2.53	2.59	2.97	2.71	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	4,629.75	5,697.79	7,689.37	8,974.11	2.61	3.22	4.39	5.04	465.25	171.55	266.75	333.87	262.56	97.09	152.34	187.67
Slovenia	1,247	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	18,247.2	15,471	14,995	15,634	15,610.28	-	-	1.13	1.07	690.67	688.75	757.46	818.45	-	-	54.87	56.15
Sweden	28,073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	1,235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	1,150.32	608.06	611.74	785.99	132.85	70.31	70.21	102.44
Ukraine	9,548	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 20: Ind 3.3A Quantity and value of marketed non-wood forest goods. marketed plant product/raw material. 2010

Country	Forest [1,000 ha]	Food		Fodder		Raw material for medicine and aromatic products		Raw material for colorants and dyes		Raw material for utensils. handicrafts & construction		Ornamental plants			Exudates		Other plant products
		1		2		3		4		5		6			7		8
	2010	Value [1,000 €]	Quantity [tonnes]	Value [1,000€]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity	Unit	Value [1,000 €]	Quantity [kg]	Value [1,000 €]
Albania	776	-	-	-	-	10,886.1	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	3,060	323	-	-	221	184	-	-	-	-	36,900	-	-	-	-	13,417
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	219
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	177.9	42,070.6	-	-	28.6	1,138.5	-	-	-	-	36.8	-	-	-	-	56.2
Croatia	1,920	24.9	73.4	1.6	14.6	20.5	301.9	-	-	-	-	27.7 3.3	11.5 24	1,000 pcs metres	-	-	0.1
Cyprus	172.8	-	-	-	-	0.3	0.5	-	-	-	-	-	-	-	-	-	81
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	587.1	-	-	-	-	-	-	-	-	-	-	141,420.9 -	10,000 31,000	1,000 pcs tonnes	-	-	-
Estonia	2,233.9	-	-	-	-	-	-	-	-	-	-	2,876	-	-	-	-	-
Finland	22,218	31,039.9	12,042	-	-	-	-	-	-	-	-	20,000 961.5	1,120 194.5	1,000 pcs tonnes	-	-	-
France	16,424	16,000	-	-	-	5,450	4,605	-	-	494	1,500	-	-	-	-	-	983
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-	-	-	500,000	-	-	-	-	80,000
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	42.7	-	-	-	-	-	-	-	-	-	-	473.9	-	-	-	-	-
Ireland	725.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	9,028	87,908	44,576.06	253	583	-	-	-	-	11,175	7,958.8	-	-	-	-	-	-
Latvia	3,354	12,011	6,593.7	-	-	-	-	-	-	-	-	556.4	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	11,669.1	4,047.2	-	-	-	-	-	-	-	-	1,086.1	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	1,227	1,005	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	-	-	-	-	-	-	363	-	-	-	-	-
Norway	12,102	2,397	850	-	-	-	-	-	-	-	-	12,484.4 593	900 400	1,000 pcs tonnes	-	-	-
Poland	9,329	27,717.3	12,841	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	55,418.5	0	-	-	-	-	-	-	-	-	-	-	-	6,792	1.2	196,513.2
Romania	6,515	5,858.9	6,972.5	-	-	515.3	821.4	-	-	-	-	4,712.7	-	-	-	-	515.7
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	16,868.6	-	-	-	4,676.9	-	-	-	-	-	-	-	-	-	-	3,471.2
Slovakia	1,938.9	3,287.4	1,934	236	47	-	-	-	-	-	-	10.6	-	-	-	-	31.9
Slovenia	1,247	260.1	26.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spain	18,247.2	195,609.2	80,181.7	-	-	210.4	6,158.8	-	-	-	-	-	-	-	4,157.2	3,959,224.5	51,245.6
Sweden	28,073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	1,235	8,333.3	-	-	-	-	-	-	-	-	-	2,608.7	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	11,188.8	22,655.9	-	-	2,473.3	1,628.2	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	60,465.1	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 21: Ind 3.3B Quantity and value of marketed non-wood forest goods, marketed animal product / raw material, 2010

Country	Forest [1,000 ha]	Living animals		Hides, skins and trophies		Wild honey and bee-wax		Wild meat		Raw material for medicine		Raw material for colorants			Other edible & non-edible animal products
		9		10		11		12		13		14			15, 16
	2010	Value [1,000 €]	Quantity [1,000 pcs]	Value [1,000 €]	Quantity [1,000 pcs]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Quantity [tonnes]	Value [1,000 €]	Value [1,000 €]
Albania	776	-	-	-	-	36,287	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	6,738	287	17,416	3,050	15,666	7,081	-	-	-	-	1,340	13,417
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	-	-	-	-	-	-	3,747	1,611	-	-	-	-	-	219
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-	-	56.2
Croatia	1,920	-	-	857	3	-	-	1,073	301	-	-	-	-	-	0.1
Cyprus	172.8	-	-	-	-	-	-	-	-	-	-	-	-	-	81
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	587.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	2,233.9	-	-	-	-	-	-	3,398	-	-	-	-	-	-	-
Finland	22,218	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	16,424	-	-	-	-	29,445	6,200	-	-	-	-	-	-	-	983
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	65,000	6,500	195,000	-	-	-	-	-	-	80,000
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	42.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	725.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	9,028	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	3,354	-	-	-	-	780	141	172	77	-	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	392	50	-	-	3,576	3,040	147	20	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	43	1	3,324	554	148	42	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	-	-	2,700	535	-	-	-	-	-	-
Norway	12,102	-	-	137	9	-	-	-	-	-	-	-	-	-	-
Poland	9,329	-	-	-	-	-	-	15,859	8,988	-	-	-	-	-	-
Portugal	3,239.1	-	-	-	-	16,857	-	-	-	-	-	-	-	-	196,513.2
Romania	6,515	-	-	1,688	-	-	-	-	-	-	-	-	-	-	515.7
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	4,756	-	12	-	3,851	-	-	-	-	-	-	3,471.2
Slovakia	1,938.9	528	7	2,757	10	-	-	2,100	1,096	-	-	-	-	-	31.9
Slovenia	1,247	-	-	880	-	-	-	494	357	-	-	-	-	-	-
Spain	18,247.2	-	-	-	-	107,833	36,199	73,228	-	-	-	-	-	-	51,245.6
Sweden	28,073	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switzerland	1,235	-	-	-	-	37,681	-	14,493	-	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 22: Ind 3.4 Value of marketed services on forest and other wooded land 2010

Country	Forest [1,000 ha]	Ecological services			Biospheric services			Social services			Amenity services			Other services			Total
		Service provision			Service provision			Service provision			Service provision			Service provision			
		Value in Euro (1,000)	Amount of service / product	Unit	Value in Euro (1,000)	Amount of service / product	Unit	Value in Euro (1,000)	Amount of service / product	Unit	Value in Euro (1,000)	Amount of service / product	Unit	Value in Euro (1,000)	Amount of service / product	Unit	Value in Euro (1,000)
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	29,551	1,799,146	ha	-	-	-	76,756	-	-	-	-	-	18,954	-	-	-
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	-	-	-	-	-	-	4,053 13,014	20,100 -	No of licenses -	-	-	-	1,061	-	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croatia	1,920	-	-	-	-	-	-	20,711	2,026,049	pc s	-	-	-	-	-	-	-
Cyprus	172.8	-	-	-	-	-	-	46	-	-	-	-	-	97	-	-	-
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	587.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	2,233.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	22,218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	16,424	-	-	-	-	-	-	45,428	-	-	-	-	-	15,415	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iceland	42.7	141	-	-	1,779	-	-	1,734	-	-	-	-	-	380	-	-	-
Ireland	725.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	9,028	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Latvia	3,354	-	-	-	1,889	487	ha	344 26,655	150,170 -	No of visits -	-	-	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	632	158	ha	-	-	-	-	-	-	-	-	-	-
Norway	12,102	-	-	-	-	-	-	69,039	-	-	-	-	-	-	-	-	-
Poland	9,329	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	-	-	-	-	-	-	30 4,217 6,297 92	323 3,634 321,710 230,000	No of fishing areas No of hunting areas No of permits No of visitors	-	-	-	19,000	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	-	-	5,300	-	-	20,057	-	-	-	-	-	123,415	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	1,675	353,000	ha	78,204	3,115,000	ha	92,326	3,751,000	ha	-	-	-	13,377	440,000	ha	-
Slovenia	1,247	-	-	-	22	9,630	ha	1,339	-	licences. No of rents	-	-	-	-	-	-	-
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	-	56,845 18,096	15,193 -	ha -	42	11	ha	38 135	48 -	ha -	-	-	-	-
Switzerland	1,235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 23: Ind 3.5 Proportion of forest under a management plan or equivalent, 1990-2010

Country	Forest [1,000 ha]	Total [1,000 ha]						Management plans [1,000 ha]					
						2010						2010	
	2010	1990	2000	2005	2010	Of which for production	Of which for protection	1990	2000	2005	2010	Of which for production	Of which for protection
Albania	776	840	769.6	782.6	776	587.1	188.9	450	446.1	446.1	188.9	0	188.9
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	3,776	3,838	3,851	3,860	2,491.6	1,368.4	1,888	1,919	1,925.5	1,968.6	-	-
Belarus	8,630	7,780	82,753	8,436	8,630	4,316.9	4,313.1	7,780	82,753	8,436	8,630	4,316.9	4,313.1
Belgium	681.2	-	-	498.9	504.1	-	-	-	320.3	323.6	360	350	10
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	3,327	3,375	3,651	3,737	2,387	572	3,327	3,375	3,651	3,737	2,387	572
Croatia	1,920	1,850	1,885	1,903	1,920	1,581	0	1,258	1,376	1,427	1,489	1,470	0
Cyprus	172.8	105.8	105.8	107	107.1	41.4	3.4	0	0	0	79.3	41.4	3.4
Czech Republic	2,657.4	2,629.4	2,637.3	2,647.4	2,657.4	-	-	2,629.4	2,637.3	2,647.4	2,657.4	-	-
Denmark	587.1	-	254	254	254	254	0	-	254	254	254	254	0
Estonia	2,233.9	1,916	1,230	1,543	1,650.9	1,493.3	157.6	1,916	1,230	1,543	1,650.9	1,493.3	157.6
Finland	22,218	21,896.8	22,458.6	22,162	22,218	18,318	3,900	-	-	-	-	-	-
France	16,424	6,090	6,480	6,348	7,354	-	-	6,090	6,480	6,348	7,354	-	-
Georgia	2,822.4	56	105	0	0	0	0	56	105	0	0	0	0
Germany	11,409	-	7,528	7,528	7,528	-	-	-	7,528	7,528	7,528	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	1,801.3	1,907.5	1,983.3	2,046.4	1,290.1	756.3	1,801.3	1,907.5	1,983.3	2,046.4	1,290.1	756.3
Iceland	42.7	8.2	20.4	27.8	33.8	22.7	5.1	5.4	15.2	21.9	24.1	19	5.1
Ireland	725.6	-	474.9	503.5	525.5	508.7	16.8	-	-	-	-	-	-
Italy	9,028	7,193.3	-	8,198.3	8,198.3	-	-	878.2	-	1,578	1,578	-	-
Latvia	3,354	-	-	3,033.2	3,072	2,403	669	-	-	3,033.2	3,072	2,403	669
Liechtenstein	6.2	6.5	6.9	6.9	6.7	-	-	6.5	6.9	6.9	6.7	-	-
Lithuania	2,170	1,945	2,020	2,121	2,170	1,879	291	1,945	2,020	1,209	1,286	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	0.3	0.3	0.3	0.3	-	-	0.3	0.3	0.3	0.3	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	193.5	222.6	225.7	297	-	-	193.5	222.6	225.7	297	-	-
Norway	12,102	-	-	-	3,379	2,902	477	-	-	-	2,661	2,612	49
Poland	9,329	-	8,465	8,485	8,663	8,468	195	-	7,402	7,491	7,529	7,334	195
Portugal	3,239.1	-	-	-	726	686	40	-	-	-	726	686	40
Romania	6,515	6,371	5,984	6,007.5	5,653	0	0	6,179.9	5,729.4	5,751.9	5,653	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	2,035	1,895	2,252	2,126	126	-	-	-	-	-	-
Slovakia	1,938.9	1,922	1,921	1,932	1,939	1,785	774.6	1,922	1,921	1,932	1,939	1,785	774.6
Slovenia	1,247	1,188	1,233	1,237	1,247	1,237	10	1,188	1,233	1,243	1,247	1,237	10
Spain	18,247.2	-	-	-	-	-	-	2,592.8	3,211.8	3,484.7	3,565.8	-	-
Sweden	28,073	28,063	28,163	28,218	27,000	-	3,470	-	-	-	-	-	-
Switzerland	1,235	-	739	873	1,007	-	-	-	714	702	689	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	9,622	10,183	10,662	11,202.8	7,730	2,598.8	9,622	10,183	10,662	11,202.8	7,730	2,598.8
Ukraine	9,548	9,274	9,510	9,575	9,548	5,122	1,357	7,422	8,260	8,331	8,553	5,122	1,289
United Kingdom	3,059	1,142	1,152	1,411	1,521	-	-	0	958	1,218	1,339	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 23: Ind 3.5 Proportion of forest under a management plan or equivalent, 1990-2010 (cont.)

Country	Forest [1,000 ha]	Equivalents [1,000 ha]					
						2010	
	2010	1990	2000	2005	2010	Of which for production	Of which for protection
Albania	776	390	323.5	336.5	587.1	587.1	0
Andorra	16	-	-	-	-	-	-
Austria	3,860	3,776	3,838	3,851	3,860	2,491.6	1,368.4
Belarus	8,630	0	0	0	0	0	0
Belgium	681.2	-	-	175.3	144.1	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-
Bulgaria	3,737	0	0	0	0	0	0
Croatia	1,920	592	509	476	431	111	0
Cyprus	172.8	105.8	105.8	107	27.8	0	0
Czech Republic	2,657.4	0	0	0	0	0	0
Denmark	587.1	-	0	0	0	0	0
Estonia	2,233.9	0	0	0	0	0	0
Finland	22,218	-	-	-	-	-	-
France	16,424	0	0	0	0	0	0
Georgia	2,822.4	0	0	0	0	0	0
Germany	11,409	0	0	0	0	0	0
Greece	3,903	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-
Hungary	2,046.4	0	0	0	0	0	0
Iceland	42.7	2.7	5.2	5.9	9.7	3.6	0
Ireland	725.6	-	-	-	-	-	-
Italy	9,028	6,315.1	-	6,620.4	6,620.4	-	-
Latvia	3,354	0	0	0	0	0	0
Liechtenstein	6.2	0	0	0	0	0	0
Lithuania	2,170	0	0	912	884	-	-
Luxembourg	86.8	-	-	-	-	-	-
Malta	0.3	0	0	0	0	0	0
Moldova	386	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-
Netherlands	373.5	0	0	0	0	-	-
Norway	12,102	-	-	-	718	290	428
Poland	9,329	-	1,063	994	1,134	1,134	0
Portugal	3,239.1	0	0	0	0	0	0
Romania	6,515	191.1	254.6	255.6	0	0	
Russian Federation *	809,090	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-
Slovakia	1,938.9	0	-	-	-	-	-
Slovenia	1,247	1,000	1,000	1,000	1,000	1,000	1,000
Spain	18,247.2	-	-	-	-	-	-
Sweden	28,073	-	-	-	-	-	-
Switzerland	1,235	-	25	171	318	-	-
FYROM	960.4	0	0	0	0	0	0
Turkey	11,202.8	0	0	0	0	0	0
Ukraine	9,548	1,852	1,250	1,244	995	0	68
United Kingdom	3,059	1,142	194	193	182	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 24: Ind 4.1B Forest, classified by number of tree species occuring, 2010

Country	Forest [1,000 ha]	Number of tree species occurring in forest							
		1		2-3		4-5		6+	
		Area	Share	Area	Share	Area	Share	Area	Share
		1,000 ha	%	1,000 ha	%	1,000 ha	%	1,000 ha	%
Albania	776	567.5	73.1	47.5	6.1	110	14.2	51	6.6
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	1,454	43.5	1,683	50.4	194	5.8	10	0.3
Belarus	8,630	2,337	27.1	5,147.9	59.7	1,111.8	12.9	33.3	0.4
Belgium	681.2	208.3	30.6	331	48.6	119.1	17.5	22.8	3.3
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-
Bulgaria	3,737	1,704	45.6	370	9.9	1,663	44.5	-	-
Croatia	1,920	394	20.5	1,185	61.7	320	16.7	21	1.1
Cyprus	172.8	169.3	98	3.5	2	0	0	0	0
Czech Republic	2,657.4	438.8	16.5	1,172.5	44.1	716.6	27	329.5	12.4
Denmark	587.1	171.6	33.5	249.3	48.6	84.5	16.5	7.4	1.4
Estonia	2,233.9	436.2	19.5	1,386.8	62.1	396.5	17.7	14.4	0.6
Finland	22,218	7,788.3	35.1	12,907.7	58.1	1,483.7	6.7	37.8	0.2
France	16,424	4,497	27.4	8,755	53.3	2,792	17	380	2.3
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	660.4	34.4	826	43	363.3	18.9	72.4	3.8
Iceland	42.7	25.2	59	15.8	36.9	1.7	3.9	0.1	0.2
Ireland	725.6	211.9	29.2	327.3	45.1	127.7	17.6	58.8	8.1
Italy	9,028	-	-	-	-	-	-	-	-
Latvia	3,354	1,179.3	35.2	1,797.5	53.6	351.6	10.5	25.6	0.8
Liechtenstein	6.2	-	-	-	-	-	-	-	-
Lithuania	2,170	314	15.3	999	48.6	589	28.6	155	7.5
Luxembourg	86.8	5.6	6.4	23.9	27.5	28.6	32.9	28.8	33.1
Malta	0.3	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	375	45.3	262	31.7	190	23	0	0
Netherlands	373.5	63	16.9	192.6	51.6	102.3	27.4	15.5	4.2
Norway	12,102	5,674	46.9	6,046	50	369	3	13	0.1
Poland	9,329	4,220	45.2	4,484	48.1	600	6.4	25	0.3
Portugal	3,239.1	2,625.8	89.2	317	10.8	-	-	-	-
Romania	6,515	1,936.8	29.7	3,317.5	50.9	1,025.9	15.7	234.9	3.6
Russian Federation *	809,090	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-
Slovakia	1,938.9	321.5	16.6	932.7	48.1	540.2	27.9	144.5	7.5
Slovenia	1,247	181.5	14.6	765.2	61.4	273.1	21.9	27.2	2.2
Spain	18,247.2	3,305.8	18.1	5,982.4	32.8	4,489.9	24.6	4,469.2	24.5
Sweden	28,073	2,947.9	10.5	22,726.5	81	2,304.7	8.2	93.8	0.3
Switzerland	1,235	215	17.7	609	50.1	317	26.1	74	6.1
FYROM	960.4	-	-	-	-	-	-	-	-
Turkey	11,202.8	6,443.8	100	-	-	-	-	-	-
Ukraine	9,548	3,487	36.5	3,128	32.8	1,937	20.3	996	10.4
United Kingdom	3,059	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 25: Ind 4.1A Forest, classified by number of tree species occuring, 2010

Country	Forest [1,000 ha]	Forest [1,000 ha]											
		Number of tree species occuring											
		1				2-5				6+			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	635.6	605	593	567.5	153.1	164.5	189.4	157.5	0	0	0	51
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	1,603	1,542	1,499	1,454	1,697	1,790	1,835	1,877	9	11	10	10
Belarus	8,630	1,367.8	1,344.2	1,464	2,337	6,292.8	6,790.9	6,844	6,259.7	119.4	137.9	128	33.3
Belgium	681.2	-	353.2	280.8	208.3	-	309.7	379.9	450.1	-	4.4	13.6	22.8
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	1,564	1,403	1,499	1,704	1,763	1,972	2,152	2,033	-	-	-	-
Croatia	1,920	455	414	393	394	1,378	1,453	1,492	1,505	17	18	18	21
Cyprus	172.8	158.6	169.1	169.4	169.3	2.5	2.5	3.5	3.5	0	0	0	0
Czech Republic	2,657.4	-	-	489.1	438.8	-	-	1,886.5	1,889.1	-	-	271.8	329.5
Denmark	587.1	-	-	172	171.6	-	-	316.9	333.8	-	-	14.8	7.4
Estonia	2,233.9	542.1	510.7	488.5	436.2	1,657.7	1,722.5	1,753.8	1,783.3	6	9.4	9.8	14.4
Finland	22,218	10,448.8	9,553.7	8,945	7,788.3	11,448	12,904.8	13,217	14,391.4	-	-	-	37.8
France	16,424	3,999	3,899	4,535	4,497	9,987	10,853	11,046	11,547	450	537	280	380
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	593.1	622.5	659.3	660.4	1,032.5	1,084.2	1,125.4	1,189.3	48.6	66.6	68.4	72.4
Iceland	42.7	12.1	18.7	22.2	25.2	3.8	10.1	14.2	17.5	0.1	0.1	0.1	0.1
Ireland	725.6	-	-	202.9	211.9	-	-	435.7	455	-	-	56.3	58.8
Italy	9,028	-	2,339.3	2,448.2	-	-	5,878.5	6,152.3	-	-	151.6	158.7	-
Latvia	3,354	-	-	1,142.4	1,179.3	-	-	2,122	2,149.1	-	-	32.6	25.6
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	311	303	314	-	1,487	1,566	1,588	-	130	145	155
Luxembourg	86.8	-	5.6	5.6	5.6	-	52.5	52.5	52.5	-	28.8	28.8	28.8
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	261	375	-	-	365	452	-	-	0	0
Netherlands	373.5	-	70	67	63	-	275	283	294.9	-	15	15	15.5
Norway	12,102	-	-	-	5,674	-	-	-	6,415	-	-	-	13
Poland	9,329	-	4,518	-	4,220	-	4,484	-	5,084	-	57	-	25
Portugal	3,239.1	-	2,564.3	2,597.8	2,625.8	-	278.3	300.9	317	-	-	-	-
Romania	6,515	-	-	-	1,936.8	-	-	-	4,343.3	-	-	-	234.9
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	363.1	354.3	341.9	321.5	1,443.1	1,446.1	1,456.2	1,472.9	115.5	121	133.5	144.5
Slovenia	1,247	-	68	61	181.5	-	1,095	1,103	1,038.3	-	71	79	27.2
Spain	18,247.2	-	3,178.3	3,235.4	3,305.8	-	9,790.8	9,966.8	10,472.3	-	4,007.9	4,079.9	4,469.2
Sweden	28,073	-	-	3,097.4	2,947.9	-	-	25,033.5	25,031.2	-	-	87.2	93.8
Switzerland	1,235	-	249	232	215	-	893	910	926	-	25	50	74
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	5,847.6	6,443.8	-	-	-	-	-	-	-	-
Ukraine	9,548	3,392	3,479	3,503	3,487	4,914	5,038	5,072	5,065	968	993	1,000	996
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 26: Ind 4.2A Forest, share of types of annual afforestation and regeneration, 2010

Country	Forest [1,000 ha]	Annual afforestation and natural expansion				Annual regeneration					
		Afforestation		Natural expansion		Natural regeneration		Regeneration by planting and/or seeding		Coppice sprouting	
		Area	Share	Area	Share	Area	Share	Area	Share	Area	Share
		1,000 ha	%	1,000 ha	%	1,000 ha	%	1,000 ha	%	1,000 ha	%
Albania	776	-	-	-	-	-	-	0.4	100	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,860	0.7	1.81	9.5	24.55	23	59.43	2.5	6.46	3	7.75
Belarus	8,630	4.1	8.8	-	-	12.2	26.18	30.3	65.02	-	-
Belgium	681.2	1.24	31.65	0.46	11.6	0.32	8.1	1.91	48.65	-	-
Bosnia and Herzegovina	2,102.7	2.9	100	-	-	-	-	-	-	-	-
Bulgaria	3,737	0.27	0.92	3.03	10.27	14.3	48.47	7	23.73	4.9	16.61
Croatia	1,920	0.2	2.59	-	-	6.05	78.47	1.46	18.94	-	-
Cyprus	172.8	0.02	7.66	-	-	-	-	0.23	92.34	0	0
Czech Republic	2,657.4	0.39	1.52	-	-	4.76	18.3	20.86	80.18	-	-
Denmark	587.1	0.78	17.9	0.01	0.19	0.16	3.64	3.39	78.27	-	-
Estonia	2,233.9	0.46	1.83	0.95	3.77	15.76	62.59	8.01	31.81	0	0
Finland	22,218	3	2.04	2	1.36	30	20.41	112	76.19	0	0
France	16,424	-	-	-	-	-	-	-	-	13	100
Georgia	2,822.4	-	-	49.9	15.65	-	-	269	84.35	-	-
Germany	11,409	9	15.24	2	3.39	41.14	69.67	6.43	10.89	0.48	0.81
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	4.99	23.84	-	-	1.53	7.31	8.15	38.94	6.26	29.91
Iceland	42.7	1.21	85.65	0.08	5.83	0.12	8.52	0	0	0	0
Ireland	725.6	6.92	50.33	0.25	1.83	-	-	6.58	47.84	0	0
Italy	9,028	1.7	2.86	52.1	87.56	3	5.04	2.7	4.54	-	-
Latvia	3,354	2.27	5.94	0.48	1.26	23.79	62.11	11.76	30.7	0	0
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	3.47	13.47	6.49	25.19	7.1	27.57	8.7	33.78	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	0.21	38.89	-	-	-	-	0.33	61.11	-	-
Netherlands	373.5	1	100	-	-	-	-	-	-	-	-
Norway	12,102	0.2	1.49	-	-	-	-	13.23	98.51	0	0
Poland	9,329	5.91	10.83	0.21	0.38	5.23	9.59	43.2	79.2	0	0
Portugal	3,239.1	20.48	80	5.12	20	-	-	-	-	-	-
Romania	6,515	1.04	4.14	0.02	0.08	13.12	52.17	10.97	43.62	-	-
Russian Federation *	809,090	11.9	1.11	58.3	5.45	748.2	69.99	250.6	23.44	-	-
Serbia	2,713	2.1	0.89	235	99.11	-	-	-	-	-	-
Slovakia	1,938.9	0.01	0.06	1.33	7.37	5.7	31.6	10.4	57.65	0.6	3.33
Slovenia	1,247	0	0	1.4	19.54	1.27	17.76	0.41	5.76	4.08	56.94
Spain	18,247.2	20.78	16.1	99.43	77.04	-	-	8.86	6.86	-	-
Sweden	28,073	0.03	0.02	24.6	12.49	34.1	17.31	138.3	70.19	0	0
Switzerland	1,235	0	0	8.08	47.81	8.19	48.46	0.56	3.31	0.07	0.41
FYROM	960.4	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	95.57	48.06	61.32	30.83	31.51	15.84	10.47	5.26	-	-
Ukraine	9,548	24.2	30.56	-	-	15.8	19.95	39.2	49.49	-	-
United Kingdom	3,059	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 27: Ind 4.2B Forest area, by types of origin, 1990-2010

Country	Forest [1,000 ha]	Forest, total							
		Forest area [1,000 ha]							
		Natural regeneration and natural expansion				Afforestation and regeneration by planting and/or seeding			
	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	685.5	672.8	684.2	682.3	103.3	96.4	98.2	94
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	1,917.5	2,043.7	2,066.1	2,078.9	1,767	1,709	1,700	1,696
Belarus	8,630	6,576.7	6,412.9	6,418.4	6,483.6	1,203.3	1,860.1	2,017.6	2,146.4
Belgium	681.2	231.1	259.2	277.6	283.4	417.7	391.2	380.1	381.6
Bosnia and Herzegovina	2,102.7	1,163	1,186	1,366	1,469	-	-	-	-
Bulgaria	3,737	1,263	1,466	1,567	1,195	978	885	825	772
Croatia	1,920	1,758	1,804	1,827	1,850	92	81	76	70
Cyprus	172.8	136.8	144.1	143.4	142.4	24.3	27.6	29.4	30.4
Czech Republic	2,657.4	-	9.3	9.3	10	-	2,624.5	2,632.3	2,638.9
Denmark	587.1	-	-	86.1	109	-	-	433.4	440
Estonia	2,233.9	2,051.5	2,076.3	2,080.7	2,059.8	154.5	166.3	171.4	174.2
Finland	22,218	17,748.1	17,346.4	16,581.3	15,688.3	4,148.7	5,112.1	5,580.7	6,529.2
France	16,424	-	-	-	12,659	-	-	-	2,070
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	5,837	5,863	6,029.5	6,041	5,388	5,416	5,278	5,290
Greece	3,903	3,181	3,472	3,618	3,763	118	129	134	140
Holy See	0	0	0	0	0	0	0	0	0
Hungary	2,046.4	166.3	169.7	179.7	185.4	1,025.9	1,084.2	1,124.1	1,168
Iceland	42.7	9.9	11	11.5	11.9	6.2	17.9	25	30.8
Ireland	725.6	82.3	82.3	82.3	71.4	382.7	552.6	612.5	654.2
Italy	9,028	7,043	7,785	8,157	8,407	501	584	582	621
Latvia	3,354	2,449	2,532	2,606	2,726	724	709	691	628
Liechtenstein	6.2	6.3	6.6	6.6	6.6	0.2	0.3	0.3	0.3
Lithuania	2,170	-	1,554	1,624	1,634	-	466	497	536
Luxembourg	86.8	57.5	58.5	58.5	58.5	28.3	28.3	28.3	28.3
Malta	0.3	0	0	0	0	0.3	0.3	0.3	0.3
Moldova	386	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	311	421.7	-	-	7.3	8.3
Netherlands	373.5	-	45.9	44.1	40.9	-	292.4	297	304.7
Norway	12,102	11,043	10,788	10,692	10,639	1,089	1,325	1,400	1,463
Poland	9,329	-	-	-	-	-	-	-	-
Portugal	3,239.1	-	2,541.1	2,457.1	2,374.1	-	40.7	43.5	43.3
Romania	6,515	4,969	4,965	4,985	5,082	1,402	1,401	1,406	1,433
Russian Federation *	809,090	796,298.7	793,908.1	791,827.5	792,099.1	12,651.2	15,360.4	16,962.5	16,990.9
Serbia	2,713	2,274	2,421	2,437	2,533	-	-	-	-
Slovakia	1,938.9	1,100.9	1,132.9	1,156.3	1,152.8	821.1	788.1	775.7	785.2
Slovenia	1,247	1,151	1,193	1,202	1,211	34	36	37	31
Spain	18,247.2	-	-	14,733.2	15,365.7	-	-	2,333.3	2,637.9
Sweden	28,073	20,664.4	18,323.8	17,119.4	15,509.1	7,398.6	9,839.2	11,098.6	12,563.9
Switzerland	1,235	937	990	1,014	1,011	157	163	167	169
FYROM	960.4	807	853	870	893	-	-	-	-
Turkey	11,202.8	6,029.2	5,724	6,787.3	6,942.5	1,495	1,952	2,192	2,840
Ukraine	9,548	3,030	3,180	3,186	3,193	4,567	4,695	4,796	4,817
United Kingdom	3,059	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 27: Ind 4.2B Forest area, by types of origin, 1990-2010 (cont.)

Country	Forest, total							
	Forest area [1,000 ha]				Natural, annual change rate			
	Coppice				1990-2010		2000-2010	
	1990	2000	2005	2010	1,000ha/yr	%	1,000ha/yr	%
Albania	-	-	-	-	-0.2	-0.02	1	0.14
Andorra	-	-	-	-	-	-	-	-
Austria	91.5	85.3	84.9	85.1	8.1	0.4	3.5	0.17
Belarus	-	-	-	-	-4.7	-0.07	7.1	0.11
Belgium	28.6	17	16.5	16.1	2.6	1.03	2.4	0.9
Bosnia and Herzegovina	-	-	-	-	15.3	1.17	28.3	2.16
Bulgaria	1,086	1,024	1,259	1,770	-3.4	-0.28	-27.1	-2.02
Croatia	-	-	-	-	4.6	0.26	4.6	0.25
Cyprus	0	0	0	0	0.3	0.2	-0.2	-0.11
Czech Republic	-	3.5	5.8	8.5	-	-	0.1	0.73
Denmark	-	-	2.1	1.6	-	-	-	-
Estonia	-	-	-	-	0.4	0.02	-1.7	-0.08
Finland	0	0	0	0	-103	-0.61	-165.8	-1
France	-	-	-	1,695	-	-	-	-
Georgia	-	-	-	-	-	-	-	-
Germany	75	75	76.5	78	10.2	0.17	17.8	0.3
Greece	-	-	-	-	29.1	0.84	29.1	0.81
Holy See	-	-	-	-	0	-	0	-
Hungary	482	519.4	549.4	568.7	1	0.55	1.6	0.89
Iceland	0	0	0	0	0.1	0.94	0.1	0.84
Ireland	0	0	0	0	-0.5	-0.71	-1.1	-1.42
Italy	46	-	20	-	68.2	0.89	62.2	0.77
Latvia	0	0	0	0	13.9	0.54	19.4	0.74
Liechtenstein	-	-	-	-	0.02	0.23	0	0
Lithuania	-	-	-	-	-	-	8	0.5
Luxembourg	-	-	-	-	0.1	0.09	0	0
Malta	-	-	-	-	0	-	0	-
Moldova	-	-	-	-	-	-	-	-
Monaco	-	-	-	-	-	-	-	-
Montenegro	-	-	307.9	396.9	-	-	-	-
Netherlands	-	21.6	24	27.9	-	-	-0.5	-1.16
Norway	0	0	0	0	-20.2	-0.19	-14.9	-0.14
Poland	-	-	-	-	-	-	-	-
Portugal	-	761.3	795.5	821.7	-	-	-16.7	-0.68
Romania	-	-	-	-	5.7	0.11	11.7	0.23
Russian Federation *	-	-	-	-	-210	-0.03	-180.9	-0.02
Serbia	-	-	-	-	13	0.54	11.2	0.45
Slovakia	78.3	40.5	35	21.8	2.6	0.23	2	0.17
Slovenia	3	4	4	5	3	0.25	1.8	0.15
Spain	-	-	215.5	243.6	-	-	-	-
Sweden	0	0	0	0	-257.8	-1.42	-281.5	-1.65
Switzerland	57	41	36	55	3.7	0.38	2.1	0.21
FYROM	-	-	-	-	4.3	0.51	4	0.46
Turkey	2,097.8	2,507	1,682.7	1,420.3	45.7	0.71	121.9	1.95
Ukraine	1,677	1,635	1,593	1,538	8.2	0.26	1.3	0.04
United Kingdom	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 28: Ind 4.3A Forest and other wooded land by classes of naturalness, 2015

Country	Forest [1,000 ha]	Forest [1,000 ha]			Other wooded land [1,000 ha]			Forest and Other wooded land [1,000 ha]			Forest [%]		
		Undisturbed by man	Semi-natural	Plantations	Undisturbed by man	Semi-natural	Plantations	Undisturbed by man	Semi-natural	Plantations	Undisturbed by man	Semi-natural	Plantations
Albania	785	62	628.2	94.8	0	452.2	0	62	1,080.4	94.8	7.9	80.03	12.08
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,869	49	3,540	280	72	80	1	121	3,620	281	1.27	91.5	7.24
Belarus	8,633.5	134.8	6,340	2,158.7	-	595.3	-	134.8	6,935.3	2,158.7	1.56	73.43	25
Belgium	683.4	0	269.2	414.2	0	35.7	0	0	304.9	414.2	0	39.39	60.61
Bosnia and Herzegovina	2,115	-	-	128	-	-	0	2.8	2,668.4	128	-	-	6.05
Bulgaria	3,823	-	2,173	760	0	-	-	-	-	-	-	56.84	19.88
Croatia	1,922	7	1,814	101	0	569	0	7	2,384	100	0.36	94.38	5.25
Cyprus	172.7	13.2	128.7	30.7	-	-	-	-	-	-	7.67	74.53	17.8
Czech Republic	2,667.4	10.1	2,657.3	0	0	0	0	10.1	2,657.3	0	0.38	99.62	0
Denmark	612.2	34.1	113.8	464.4	14.1	5.7	25.6	48.2	119.5	490	5.57	18.58	75.85
Estonia	2,232	58.5	2,169.1	4.4	0.5	223.1	0	58.9	2,392.2	4.4	2.62	97.18	0.2
Finland	22,218	230.2	15,212.1	6,775.2	15.7	584.1	201.4	245.9	15,796.2	6,976.6	1.04	68.47	30.49
France	16,989	-	15,022	1,967	0	590	0	-	15,612	1,967	-	88.42	11.58
Georgia	2,822.4	2,750.4	0	72	0	0	0	2,750.4	0	72	97.45	0	2.55
Germany	11,419	0	11,419	0	0	0	0	0	11,419	0	0	100	0
Greece	3,903	0	3,763	140	0	2,636	0	0	6,399	140	0	96.41	3.59
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	0.1	1,111.8	835.3	-	-	-	-	-	-	0.01	53.73	40.37
Iceland	49.1	0	12.2	47.9	0	138.1	6.1	0	150.3	54	0	24.78	97.55
Ireland	754	-	70.9	683.1	-	-	-	-	-	-	-	9.4	90.6
Italy	9,297	93	8,565	639	0	-	-	93	-	-	1	92.13	6.87
Latvia	3,356	15.8	3,331.8	8.4	0	112	0	15.8	3,443.8	8.4	0.47	99.28	0.25
Liechtenstein	6.2	1.7	5	0.3	-	-	-	-	-	-	27.42	80.65	4.84
Lithuania	2,180	26	2,154	0	0	104	0	26	2,258	0	1.19	98.81	0
Luxembourg	86.8	0	58.5	28.3	-	-	-	-	-	-	0	67.44	32.62
Malta	0.3	0	0	0.3	0	0	0	0	0	0.3	0	0	100
Moldova	409	0	407	2	-	-	-	-	-	-	0	99.51	0.49
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	109	709.5	8.3	-	-	-	-	-	-	13.18	85.82	1
Netherlands	376	0	373	3	0	0	0	0	373	3	0	99.2	0.8
Norway	12,112	160	-	-	-	-	-	-	-	-	1.32	-	-
Poland	9,435	59	9,316	60	0	0	0	59	9,316	60	0.63	98.74	0.64
Portugal	3,182.1	24.1	2,267	891	-	-	-	-	-	-	0.76	71.24	28
Romania	6,861	283	-	569	-	-	-	-	-	-	4.12	-	8.29
Russian Federation *	809,090	256,481.5	535,617.6	16,990.9	73,220	-	-	329,701.5	535,617.6	16,990.9	31.7	66.2	2.1
Serbia	2,720	1	2,504	215	0	508	0	1	3,012	215	0.04	92.06	7.9
Slovakia	1,940	24	1,897	19	0	0	0	24	1,897	19	1.24	97.78	0.98
Slovenia	1,248	49	1,165	34	-	-	-	-	-	-	3.93	93.35	2.72
Spain	18,417.9	0	15,509.4	2,908.5	0	9,208.8	0	0	24,718.2	2,908.5	0	84.21	15.79
Sweden	28,073	2,417	24,963	693	1,136	1,296	0	3,553	26,259	693	8.61	88.92	2.47
Switzerland	1,254	40	1,212.2	1.8	8.9	61.1	0	48.9	1,273.3	1.8	3.19	96.67	0.14
FYROM	987.5	-	-	-	-	-	-	10.7	-	-	-	-	-
Turkey	11,943	913	7,644	3,386	-	-	-	-	-	-	7.64	64	28.35
Ukraine	9,657	59	9,230	368	0	26	0	59	9,256	368	0.61	95.58	3.81
United Kingdom	3,144	0	-	-	0	-	-	0	-	-	0	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 29: Ind 4.3B Forest by classes of naturalness, 1990-2015

Country	Forest [1,000 ha]	Forest [1,000 ha]							
		Undisturbed by man					Semi-natural		
	2015	1990	2000	2005	2010	2015	1990	2000	2005
Albania	785	-	261.6	261.6	122	62	-	411.5	423
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,869	62	64	59	54	49	3,443	3,498	3,514
Belarus	8,633.5	-	134.8	134.8	134.8	134.8	-	6,278.1	6,283.6
Belgium	683.4	0	0	0	0	0	210.1	236.9	249.8
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-
Bulgaria	3,823	157	270	304	597	-	2,138	2,172	2,473
Croatia	1,922	7	7	7	7	7	1,736	1,775	1,794
Cyprus	172.7	13.2	13.2	13.2	13.2	13.2	123.5	130.8	130.2
Czech Republic	2,667.4	9.3	9.3	9.3	10	10.1	2,620.1	2,628	2,638.1
Denmark	612.2	30	32.3	30.8	32.5	34.1	101.8	109.7	104.5
Estonia	2,232	39.6	47.7	51.6	54.7	58.5	2,162.1	2,191.2	2,196.8
Finland	22,218	-	-	-	230.2	230.2	17,485.3	17,492.1	16,242.3
France	16,989	-	-	-	-	-	12,908	13,703	13,656
Georgia	2,822.4	2,698.3	2,700.6	2,712	2,750.4	2,750.4	0	0	0
Germany	11,419	0	0	0	0	0	11,300	11,354	11,384
Greece	3,903	0	0	0	0	0	3,181	3,472	3,618
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,069.1	0.1	0.1	0.1	0.1	0.1	916.6	970.6	1,042.2
Iceland	49.1	0	0	0	0	0	9.9	11	11.5
Ireland	754	-	-	-	-	-	81.8	81.8	81.8
Italy	9,297	93	93	93	93	93	6,950	7,692	8,064
Latvia	3,356	17	17.1	15.6	15.5	15.8	3,154.1	3,222	3,278.5
Liechtenstein	6.2	1.5	1.7	1.7	1.7	1.7	4.8	5.2	5.2
Lithuania	2,180	20	21	26	26	26	1,925	1,999	2,095
Luxembourg	86.8	0	0	0	0	0	57.5	58.5	58.5
Malta	0.3	0	0	0	0	0	0	0	0
Moldova	409	0	0	0	0	0	318	323	362
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	79	109	109	-	-	539.9
Netherlands	376	0	0	0	0	0	314	356	361
Norway	12,112	160	160	160	160	160	-	-	-
Poland	9,435	30	51	54	56	59	8,819	8,982	9,118
Portugal	3,182.1	-	24.1	24.1	24.1	24.1	-	2,517	2,433
Romania	6,861	233	300	300	300	283	4,736	4,665	4,685
Russian Federation *	809,090	241,725.7	258,130.8	255,469.8	256,481.5	-	554,573.3	535,777.3	536,357.7
Serbia	2,720	1	1	1	1	1	2,273	2,420	2,436
Slovakia	1,940	24	24	24	24	24	1,874.7	1,877.4	1,888.6
Slovenia	1,248	49	53	49	49	49	1,105	1,144	1,157
Spain	18,417.9	0	0	0	0	0	11,773	14,473.1	14,733.2
Sweden	28,073	2,417	2,417	2,417	2,417	2,417	25,126	25,128	25,159
Switzerland	1,254	40	40	40	40	40	-	1,153.7	1,176.2
FYROM	987.5	-	-	-	-	-	-	-	-
Turkey	11,943	826	837	859	881	913	7,301	7,394	7,611
Ukraine	9,657	59	59	59	59	59	8,912	9,120	9,182
United Kingdom	3,144	0	0	0	0	0	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 29: Ind 4.3B Forest by classes of naturalness, 1990-2015

Country	Forest [1,000 ha]	Forest [1,000 ha]						
		Semi-natural		Plantations				
	2015	2010	2015	1990	2000	2005	2010	2015
Albania	785	560	628.2	-	96.4	98	94	94.8
Andorra	16	-	-	-	-	-	-	-
Austria	3,869	3,527	3,540	271	276	278	279	280
Belarus	8,633.5	6,448.8	6,340	-	1,860.1	2,017.6	2,046.4	2,158.7
Belgium	683.4	262.6	269.2	467.3	430.4	424.5	418.6	414.2
Bosnia and Herzegovina	2,115	-	-	124	124	124	128	128
Bulgaria	3,823	2,323	2,173	1,032	933	874	817	760
Croatia	1,922	1,813	1,814	107	103	102	100	101
Cyprus	172.7	129.2	128.7	24.3	27.6	29.4	30.4	30.7
Czech Republic	2,667.4	2,647.4	2,657.3	0	0	0	0	0
Denmark	612.2	100.9	113.8	411.5	443.5	422.5	453.7	464.4
Estonia	2,232	2,175.3	2,169.1	4.2	3.7	3.7	4	4.4
Finland	22,218	15,212.1	15,212.1	4,390	4,952.7	5,900.9	6,775.2	6,775.2
France	16,989	14,338	15,022	1,528	1,586	2,205	2,086	1,967
Georgia	2,822.4	0	0	54	60	60.5	72	72
Germany	11,419	11,409	11,419	0	0	0	0	0
Greece	3,903	3,763	3,763	118	129	134	140	140
Holy See	0	-	-	-	-	-	-	-
Hungary	2,069.1	1,089.2	1,111.8	757.5	802.6	810.9	832.8	835.3
Iceland	49.1	11.9	12.2	15.9	28.1	35.4	41.5	47.9
Ireland	754	70.9	70.9	383.3	553.2	613.1	654.7	683.1
Italy	9,297	8,314	8,565	547	584	602	621	639
Latvia	3,356	3,335.1	3,331.8	1.9	1.9	2.9	3.4	8.4
Liechtenstein	6.2	5	5	0.2	0.3	0.3	0.3	0.3
Lithuania	2,180	2,144	2,154	0	0	0	0	0
Luxembourg	86.8	58.5	58.5	28.3	28.3	28.3	28.3	28.3
Malta	0.3	0	0	0.3	0.3	0.3	0.3	0.3
Moldova	409	384	407	1	1	1	2	2
Monaco	0	-	-	-	-	-	-	-
Montenegro	826.8	709.5	709.5	-	-	7.4	8.3	8.3
Netherlands	376	369.5	373	31	4	4	4	3
Norway	12,112	11,827	-	-	-	-	115	-
Poland	9,435	9,223	9,316	32	26	28	50	60
Portugal	3,182.1	2,350	2,267	-	802	839	865	891
Romania	6,861	4,782	-	1,402	1,401	1,406	1,433	569
Russian Federation *	809,090	535,617.6	-	12,651.2	15,360.4	16,962.5	16,990.9	-
Serbia	2,720	2,532	2,504	39	39	39	180	215
Slovakia	1,940	1,895.9	1,897	23	20	19	19	19
Slovenia	1,248	1,166	1,165	34	36	37	32	34
Spain	18,417.9	15,365.7	15,509.4	2,036.5	2,503.8	2,548.9	2,881.5	2,908.5
Sweden	28,073	25,015	24,963	520	618	642	642	693
Switzerland	1,254	1,193.7	1,212.2	-	0.3	0.8	1.3	1.8
FYROM	987.5	-	-	-	-	-	-	-
Turkey	11,943	7,481.8	7,644	1,495	1,952	2,192	2,840	3,386
Ukraine	9,657	9,146	9,230	303	331	334	343	368
United Kingdom	3,144	344	-	-	-	-	2,716	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 30: Ind 4.4 Area of forest dominated by introduced tree species, 1990 2015 and share of forest area dominated by introduced tree species, 2015

Country	Forest [1,000 ha]	Introduced tree species						Of which invasive				
		1990	2000	2005	2010	2015		1990	2000	2005	2010	2015
	2015	[1,000 ha]					%	[1,000 ha]				
Albania	785	15.5	7.4	8.4	7.4	-	-	2.5	2.5	2.5	3.3	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-
Austria	3,869	36.0	43.0	44.0	45.0	46.0	1.2	15.0	19.0	19.0	19.0	19.0
Belarus	8,633.5	0.6	0.6	0.6	0.6	-	-	-	-	-	0.6	0.6
Belgium	683.4	-	318.5	314.2	310.1	301.2	44.1	-	-	-	-	-
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	135.0	139.0	173.0	204.0	235.0	6.1	-	-	-	-	-
Croatia	1,922	82.0	82.0	83.0	83.0	84.0	4.4	54.0	55.0	56.0	56.0	57.0
Cyprus	172.7	1.4	1.4	1.4	1.4	1.4	0.8	-	-	-	-	-
Czech Republic	2,667.4	-	-	29.0	27.6	24.8	0.9	0.0	0.0	0.0	0.0	0.0
Denmark	612.2	263.5	284.0	270.6	275.8	281.5	46.0	-	-	34.8	31.7	33.8
Estonia	2,232	1.7	1.6	1.5	1.5	1.4	0.1	0.0	0.0	0.0	0.0	0.0
Finland	22,218	21.0	22.0	23.0	29.0	29.0	0.1	0.0	0.0	0.0	0.0	0.0
France	16,989	1,140.0	1,263.0	1,495.0	1,385.0	1,275.0	7.5	-	-	-	-	-
Georgia	2,822.4	16.5	16.5	16.5	16.5	16.5	0.6	0.0	0.0	0.0	0.0	0.0
Germany	11,419	-	170.9	218.7	218.7	218.7	1.9	0.0	0.0	0.0	0.0	0.0
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	683.6	743.5	799.5	820.6	859.5	41.5	298.3	362.2	426.0	463.3	503.2
Iceland	49.1	4.7	14.5	20.1	25.0	30.0	61.1	0.0	0.0	0.0	0.0	0.0
Ireland	754	306.1	435.3	480.9	494.7	523.0	69.4	-	-	-	-	-
Italy	9,297	325	327	326.9	334	341	3.7	201.0	223.0	234.0	241.0	248.0
Latvia	3,356	1.9	1.9	1.9	1.8	1.8	0.1	0.0	0.0	0.0	0.0	0.0
Liechtenstein	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	2,180	4.0	4.0	4.0	3.0	3.0	0.1	0.0	0.0	0.0	0.0	0.0
Luxembourg	86.8	-	26.2	26.2	26.2	26.2	30.2	0.0	0.0	0.0	0.0	0.0
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	0.8	0.9	0.1	-	-	-	0.7	0.9
Netherlands	376	107.0	106.0	105.0	99.5	95.0	25.3	0.0	0.0	0.0	0.0	0.0
Norway	12,112	-	63	69	76	83	0.7	0.0	0.0	0.0	0.0	0.0
Poland	9,435	-	20	28	45	55	0.6	-	-	-	39	49
Portugal	3,182.1	-	965.5	1,010.3	1,041.0	1,071.8	33.7	-	-	44.4	45.1	-
Romania	6,861	-	340.0	-	425.0	425.0	6.2	-	-	-	69.6	69.6
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,720	2.0	1.3	1.6	1.6	-	-	0.0	0.0	0.0	-	-
Slovakia	1,940	43.6	42.4	40.9	57.0	56.8	2.9	26.2	26.4	26.1	34.0	34.0
Slovenia	1,248	-	11.9	16.0	36.2	-	-	-	9.4	11.2	9	-
Spain	18,417.9	861.9	1,059.6	1,078.7	1,204.6	1,215.8	6.6	-	-	5.7	5.9	-
Sweden	28,073	464.4	517.0	536.1	525.3	527.5	1.9	0.0	0.0	0.0	0.0	0.0
Switzerland	1,254	-	5.0	5.8	6.6	7.4	0.6	0.0	0.0	0.0	0.0	0.0
FYROM	987.5	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,943	-	-	74.0	71.0	59.0	0.5	0.0	0.0	0.0	0.0	0.0
Ukraine	9,657	303.0	331.0	334.0	343.0	368.0	3.8	24.0	26.0	26.0	27.0	27.0
United Kingdom	3,144	-	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 31: Ind 4.5 Average volume of standing and lying deadwood in forest, 1990-2010

Country	Forest [1,000 ha]	Volume of deadwood [m³/ha]											
		total				standing				lying			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	0.01	0.50	-	-	0.01	0.50	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	13.70	17.40	20.30	3.90	5.30	6.60	7.50	-	8.40	10.80	12.80
Belarus	8,630	-	2.10	1.00	1.20	-	1.20	0.70	0.90	-	0.80	0.30	0.40
Belgium	681.2	-	7.10	7.00	7.30	-	2.80	2.80	2.90	-	4.30	4.10	4.40
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-
Croatia	1,920	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	172.8	-	-	-	-	0.70	0.90	0.90	0.90	-	-	-	-
Czech Republic	2,657.4	-	-	11.60	11.60	-	-	4.80	4.80	-	-	6.80	6.80
Denmark	587.1	0.00	0.00	5.40	5.50	-	-	2.90	4.00	-	-	2.50	1.50
Estonia	2,233.9	8.80	9.90	12.50	16.90	5.90	5.90	6.90	7.90	2.90	4.00	5.60	9.00
Finland	22,218	-	5.60	5.70	5.60	-	1.30	1.60	1.70	-	4.30	4.00	4.00
France	16,424	-	-	-	-	-	-	-	7.00	-	-	-	17.00
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	11.50	23.70	20.60	-	2.40	5.50	4.70	-	9.10	18.20	15.90
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	7.70	5.10	6.30	7.20	4.60	-	-	-	3.00
Iceland	42.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	725.6	-	-	6.60	7.60	-	-	2.70	3.20	-	-	4.00	4.30
Italy	9,028	7.30	8.30	8.70	9.20	4.50	5.00	5.30	5.60	2.90	3.30	3.40	3.60
Latvia	3,354	6.00	6.00	17.70	23.50	-	-	6.90	9.20	-	-	10.80	14.30
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	20.00	20.00	30.00
Lithuania	2,170	23.00	23.00	23.00	23.00	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	11.60	11.60	-	-	4.40	4.40	-	-	7.20	7.20	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	5,3	5,3	6,7	-	2,5	2,5	3,1	-	2,8	2,8	3,5
Netherlands	373.5	5,7	7,7	9,8	11,9	2,7	3,6	4,6	5,7	3,0	4,1	5,2	6,2
Norway	12,102	-	6,8	-	9,4	-	2,3	-	3,4	-	4,5	-	6,0
Poland	9,329	-	-	-	5,8	-	-	-	2,7	-	-	-	3,1
Portugal	3,239.1	-	-	-	-	-	-	2,7	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	22.50	21.90	21.80	22.00	6.80	6.60	6.60	6.70	15.80	15.40	15.30	15.30
Serbia	2,713	-	-	-	-	-	-	-	-	1.40	1.20	1.20	1.20
Slovakia	1,938.9	-	-	-	40.60	-	-	-	12.40	-	-	-	28.20
Slovenia	1,247	12.70	14.90	17.00	19.80	3.60	4.20	4.80	7.10	9.10	10.70	12.20	12.70
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	7.50	7.80	-	-	2.90	3.10	-	-	4.60	4.70
Switzerland	1,235	7.10	16.30	20.90	23.40	5.00	9.50	11.70	11.90	2.10	6.80	9.20	11.50
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	8.20	5.80	5.90	6.00	5.50	3.60	3.70	3.70	2.70	2.20	2.20	2.30
United Kingdom	3,059	3.90	3.90	3.90	3.90	0.80	0.80	0.80	0.80	3.10	3.10	3.10	3.10

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 32: Ind 4.6A Areas managed for conservation and utilisation of forest tree genetic resources (in situ and ex situ conservation) and areas managed for seed production by countries in 1990, 2000, 2005, 2010 and 2015

	Area managed for in situ genetic conservation [ha]					Area managed for ex situ genetic conservation [ha]					Area managed for seed production [ha]				
Reference year	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	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.
Andorra	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.
Austria	1,693	1	14,416	9,178	9,178	16	93	95	96	78	N.A.	N.A.	7,175	26,020	27,960
Belarus	5,248	5,248	6,086	6,223	6,242	1,021	1,823	1,796	1,797	1,798	1,434	2,301	2,101	2,112	2,109
Belgium	1,003	1,448	1,700	1,695	1,566	65	88	119	181	219	1,407	3,579	3,876	3,937	2,379
Bosnia and Herzegovina	3,559	N.A.	4,942	2,905	3,277	11	N.A.	11	67	72	1,766	N.A.	3,233	2,972	3,349
Bulgaria	N.A.	131,744	145,105	60,051	90,791	161	514	540	856	352	50,035	52,840	51,267	52,081	34,037
Croatia	5,162	5,274	4,977	1,216	4,120	75	80	80	48	114	22	27	74	5,059	71,444
Cyprus	250	5,445	5,445	N.A.	4,065	N.A.	N.A.	3	3	4	19	19	19	3	4,069
Czech Republic	106,001	106,001	106,001	111,794	34,804	338	357	357	290	301	149,000	137,361	111,794	217,357	141,950
Denmark	N.A.	N.A.	4,650	2,880	2,880	N.A.	N.A.	N.A.	40	76	N.A.	N.A.	1,632	1,550	1,388
Estonia	3,551	3,224	3,195	2,878	2,878	222	256	227	230	254	N.A.	N.A.	2,546	2,429	2,398
Finland	0	7,030	6,941	7,599	7,218	0	6	7	8	8	3,041	2,830	2,824	2,935	2,405
France	N.A.	9,762	10,228	11,451	12,728	N.A.	28	32	32	491	75,408	66,254	60,695	63,566	61,858
Georgia	N.A.	N.A.	N.A.	809	809	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1,120	1,032
Germany	1,891	11,093	12,618	32,366	33,437	268	1,112	1,123	1,181	1,193	102	801	625	193,974	169,964
Greece	30,797	30,797	30,797	30,797	30,797	2	3	6	6	6	N.A.	N.A.	7,532	7,532	7,532
Holy See	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.
Hungary	N.A.	N.A.	2,289	0	425	27	57	91	32	33	3,773	4,400	4,359	3,889	4,247
Iceland	0	0	0	292	292	0	14	14	55	55	0	9	10	10	12
Ireland	N.A.	N.A.	N.A.	633	705	25	29	29	82	29	2,282	N.A.	3,828	4,343	4,502
Italy	92,914	92,914	92,914	59,787	62,660	49	34	34	184	204	13	13	13	286	37,455
Latvia	4,950	5,565	4,883	4,888	4,888	238	328	438	539	607	7,583	7,452	7,067	1,445	705
Liechtenstein	N.A.	N.A.	1,278	1,278	1,274	N.A.	N.A.	N.A.	N.A.	0	N.A.	51	51	51	434
Lithuania	3,081	3,144	4,650	3,626	3,621	25	35	35	90	1,071	1,310	1,450	1,992	2,547	2,385
Luxembourg	0	0	0	995	1,434	0	0	6	17	47	106	N.A.	144	144	185
Malta	N.A.	N.A.	N.A.	N.A.	555	N.A.	N.A.	N.A.	N.A.	0	N.A.	N.A.	N.A.	N.A.	0
Moldova	N.A.	1,991	1,991	2,171	N.A.	N.A.	25	25	63	N.A.	N.A.	31	31	67	N.A.
Monaco	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.
Montenegro	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.
Netherlands	0	0	0	330	330	0	5	12	6	6	28	47	47	62	62
Norway	20	48	48	13,763	13,764	N.A.	78	78	78	69	207	217	217	217	211
Poland	0	4,737	5,258	6,070	6,242	0	45	584	865	1,285	223,331	226,068	222,086	211,516	196,208
Portugal	0	0	0	42	142	0	91	104	50	50	N.A.	23,855	25,294	26,349	26,349
Romania	0	10,702	12,150	11,008	10,559	114	129	135	385	683	59,058	59,058	59,775	59,775	40,209
Russian Federation *	26,621	25,927	91,623	N.A.	N.A.	1	17	241	N.A.	N.A.	153	1,970	1,201	N.A.	N.A.
Serbia	N.A.	N.A.	78,419	337	337	13	16	16	18	20	N.A.	2,060	1,902	1,628	1,625
Slovakia	N.A.	9,631	21,540	33,139	33,429	232	381	373	810	352	51,860	59,072	60,388	68,400	68,930
Slovenia	0	0	0	1,135	1,101	0	0	0	6	3	2,399	2,295	3,567	4,081	4,280
Spain	0	0	320	4,820	50,513	0	10	52	71	74	0	33,560	29,642	17,869	19,108
Sweden	520	520	520	520	559	0	26	26	21	12	0	4,054	4,054	4,081	2,735
Switzerland	N.A.	N.A.	1,464	952	1,426	N.A.	N.A.	N.A.	0	4	N.A.	2,270	2,680	3,622	3,682
FYROM	N.A.	N.A.	N.A.	967	N.A.	N.A.	N.A.	N.A.	117	N.A.	N.A.	N.A.	N.A.	306	N.A.
Turkey	N.A.	20,387	27,477	34,615	37,326	24	27	38	118	125	35,916	45,377	46,219	43,773	47,436
Ukraine	29,075	30,363	26,566	25,812	25,715	121	397	397	N.A.	1,827	1,445	1,490	1,490	16,091	18,919
United Kingdom	N.A.	17,882	17,882	0	0	177	249	256	18	18	2,372	2,621	2,245	13,867	13,867

* Data received only for the Komi, Arkhangelsk, Karelia and Vologda Regions

Source: European Forest Genetic Resources Programme, Bioversity International

DATA PROVIDERS: Heino Konrad (Austria), Oleg Baranov (Belarus), Bart De Cuyper (Belgium), Dalibor Ballian (Bosnia and Herzegovina), Mariya Nikolova-Belovarska (Bulgaria), Mladen Ivankovic (Croatia), Andreas K. Christou (Cyprus), Josef Frýdl (Czech Republic), Ditte Christina Olrik (Denmark), Tiit Maaten (Estonia), Leena Yrjänä (Finland), Eric Collin (France), Irina Tvauri (Georgia), Michaela Haverkamp (Germany), Despina Paitaridou (Greece), Sándor Bordács (Hungary), Throstur Eysteinsson (Iceland), Cathal Ryan (Ireland), Fulvio Ducci (Italy), Inga Zariņa (Latvia), Patrick Insinna (Liechtenstein), Virgilijus Baliuckas (Lithuania), Thierry Palgen (Luxembourg), Duncan Borg (Malta), Sven de Vries (Netherlands), Arne Steffenrem (Norway), Jan Matras (Poland), Maria Carolina Varela (Portugal), Radu Sbirnea (Romania), Andrej Pilipović (Serbia), Dagmar Bednarova (Slovakia), Marjana Westergren (Slovenia), Eduardo Notivol Paino (Spain), Sanna Black-Samuelsson (Sweden), Peter Rotach (Switzerland), Gaye Eren Kandemir (Turkey), Svitlana Los (Ukraine) and Jason Hubert (United Kingdom).

Table 33: Ind 4.6B Areas managed for in situ conservation of forest tree genetic resources by selected tree species in 1990, 2000, 2005, 2010 and 2015

Species	1990		2000		2005		2010		2015	
	ha	number countries	ha	number countries	ha	number countries	ha	number countries	ha	number countries
Abies alba	33,860	9	48,545	13	52,729	15	36,315	15	36,060	16
Abies cephalonica	-	-	-	-	-	-	-	-	-	-
Abies grandis	-	-	3	1	20	3	18	2	45	2
Abies pinsapo	-	-	-	-	100	1	100	1	361	2
Acer platanoides	235	2	249	4	544	7	1,025	10	951	9
Acer pseudoplatanus	22,558	4	22,856	9	23,211	11	4,886	10	4,821	11
Alnus glutinosa	734	8	1,232	14	1,616	16	1,440	13	1,631	19
Alnus incana	10	1	115	2	132	4	83	6	686	5
Betula pendula	4,970	5	6,452	10	6,556	11	2,042	13	2,963	13
Betula pubescens	73	2	743	5	863	6	1,422	6	1,861	6
Carpinus betulus	4,808	6	6,481	10	7,146	12	3,045	15	4,016	16
Castanea sativa	25	2	902	3	934	7	1,023	6	1,508	8
Cedrus atlantica	-	-	-	-	-	-	-	-	43	2
Cedrus libani	-	-	-	-	-	-	2,735	1	2,555	2
Fagus sylvatica	105,105	8	149,784	13	166,509	17	77,990	20	76,131	22
Fraxinus angustifolia	351	2	746	4	835	3	947	7	6,872	9
Fraxinus excelsior	8,064	6	10,373	12	11,497	17	5,444	19	5,428	20
Larix decidua	28,478	8	29,902	11	30,495	12	13,052	10	9,918	11
Larix x eurolepis	19	2	29	2	32	3	5	2	5	1
Larix kaempferi	15	2	11	1	42	2	71	2	16	1
Larix sibirica	1,924	1	1,924	1	3,989	1	0	1	0	1
Picea abies	85,482	14	126,804	18	156,284	21	127,698	22	76,847	23
Picea sitchensis	-	-	2	1	4	2	6	1	-	-
Pinus brutia	26	1	7,862	2	8,820	2	8,696	2	8,325	3
Pinus canariensis	-	-	-	-	-	-	-	-	2,426	1
Pinus cembra	1,206	3	2,105	6	2,106	6	3,299	5	3,938	7
Pinus contorta	-	-	-	-	1	1	-	-	-	-
Pinus halepensis	1,982	2	1,898	2	1,858	3	4,660	3	6,957	3
Pinus leucodermis	3,160	2	3,354	2	4,381	3	2,333	3	1,146	2
Pinus nigra	636	4	13,463	8	15,992	10	11,293	13	24,022	11
Pinus pinaster	2,923	2	2,922	2	2,905	3	5,826	5	43,758	5
Pinus pinea	589	2	904	3	893	3	4,254	1	4,538	2
Pinus radiata	-	-	-	-	-	-	-	-	-	-
Pinus sylvestris	27,826	13	77,990	19	120,858	22	42,758	20	45,041	20
Populus alba	-	-	43	2	64	2	155	5	115	5
Populus nigra	637	1	683	4	725	4	1,135	6	2,677	8
Populus tremula	297	3	1,010	7	1,495	8	1,329	9	1,624	9
Prunus avium	2,328	4	2,395	6	2,618	8	1,222	11	1,129	13
Pseudotsuga menziesii	248	4	707	5	874	7	538	3	1,513	5
Quercus cerris	2,391	2	4,958	5	4,868	6	1,810	8	4,389	7
Quercus ilex	2,542	1	2,608	2	2,567	2	748	2	1,772	4
Quercus petraea	15,177	8	32,207	14	32,839	19	14,286	23	22,315	23
Quercus pubescens	2,993	2	3,332	5	3,377	7	959	7	985	7
Quercus robur	20,471	10	23,939	14	25,195	19	13,747	21	19,416	24
Quercus rubra	28	3	48	3	152	4	341	5	290	2
Quercus suber	-	-	-	-	-	-	101	2	85	2
Robinia pseudoacacia	14	2	193	3	314	6	195	3	191	2
Tilia cordata	6,215	6	6,533	11	7,003	13	1,391	14	1,029	15
Tilia platyphyllos	233	2	906	4	1,113	6	270	6	393	6

Source: European Forest Genetic Resources Programme, Bioversity International

DATA PROVIDERS: Heino Konrad (Austria), Oleg Baranov (Belarus), Bart De Cuyper (Belgium), Dalibor Ballian (Bosnia and Herzegovina), Mariya Nikolova-Belovarska (Bulgaria), Mladen Ivankovic (Croatia), Andreas K. Christou (Cyprus), Josef Frýdl (Czech Republic), Ditte Christina Olrik (Denmark), Tiit Maaten (Estonia), Leena Yrjänä (Finland), Eric Collin (France), Irina Tvauri (Georgia), Michaela Haverkamp (Germany), Despina Paitaridou (Greece), Sándor Bordács (Hungary), Throstur Eysteinsson (Iceland), Cathal Ryan (Ireland), Fulvio Ducci (Italy), Inga Zariņa (Latvia), Patrick Insinna (Liechtenstein), Virgilijus Baliuckas (Lithuania), Thierry Palgen (Luxembourg), Duncan Borg (Malta), Sven de Vries (Netherlands), Arne Steffenrem (Norway), Jan Matras (Poland), Maria Carolina Varela (Portugal), Radu Sbirnea (Romania), Andrej Pilipovič (Serbia), Dagmar Bednarova (Slovakia), Marjana Westergren (Slovenia), Eduardo Notivol Paino (Spain), Sanna Black-Samuelsson (Sweden), Peter Rotach (Switzerland), Gaye Eren Kandemir (Turkey), Svitlana Los (Ukraine) and Jason Hubert (United Kingdom).

Table 34: Ind 4.6C Areas managed for ex situ conservation of forest tree genetic resources by selected tree species in 1990, 2000, 2005, 2010 and 2015

Species	1990		2000		2005		2010		2015	
	ha	number countries	ha	number countries	ha	number countries	ha	number countries	ha	number countries
Abies alba	30.8	8	124.8	12	183.8	12	307.3	12	309.7	14
Abies cephalonica	0.5	1	0.5	1	0.5	1	6	1	18.5	2
Abies grandis	7.9	3	8.5	4	12.3	4	23.1	7	19.9	7
Abies pinsapo	-	0	-	0	-	0	-	0	3.3	1
Acer platanoides	-	0	1.2	1	1.9	2	11.7	5	5.2	4
Acer pseudoplatanus	23.1	3	35.8	7	90	7	32.1	6	32.2	8
Alnus glutinosa	5.8	5	19.6	7	55.4	9	37.9	6	92.6	11
Alnus incana	3.2	2	2.2	2	2.2	2	1.6	1	3.6	2
Betula pendula	7.8	2	94.7	3	127.3	5	169.3	9	200.9	10
Betula pubescens	1	1	4.9	2	6.9	3	10.1	2	14.1	3
Carpinus betulus	-	0	8.4	2	10.5	3	6.3	3	3.9	2
Castanea sativa	-	0	10	1	11.6	1	18.6	3	32.5	4
Cedrus atlantica	4.5	1	4.5	1	4.5	1	7.1	3	10.5	5
Cedrus libani	3.3	1	3.3	1	3.3	1	5.5	3	16.7	3
Fagus sylvatica	75.3	2	232.7	6	267.7	6	300.3	13	113.7	13
Fraxinus angustifolia	-	0	0.2	1	0.7	1	0.5	1	14.7	4
Fraxinus excelsior	5.5	1	26.7	11	51.3	12	64.8	12	109.4	13
Larix decidua	247.4	12	302.8	12	328.4	14	275.4	14	339.1	14
Larix x eurolepis	5.1	2	14.8	3	18.8	4	43.7	3	41.2	3
Larix kaempferi	1.6	2	2.8	2	9.8	3	2.3	2	5.1	4
Larix sibirica	-	0	4	1	10.3	2	5	1	6.2	2
Picea abies	618.6	14	956.5	18	1,284.8	20	1,338.1	18	1,506	22
Picea sitchensis	84.9	5	131.6	7	131.6	7	47.1	6	54.9	8
Pinus brutia	10.1	2	10.1	2	20	2	102.5	2	135.7	2
Pinus canariensis	-	0	-	0	-	0	-	0	270.3	2
Pinus cembra	21.8	4	33	4	34	4	17.5	2	2.4	1
Pinus contorta	38	3	39.4	4	40.5	5	27.2	4	48.9	9
Pinus halepensis	22.6	2	17	2	17	2	10	1	12	2
Pinus leucodermis	-	0	-	0	-	0	2	1	-	0
Pinus nigra	55.6	8	78.9	8	151.7	9	291.1	8	298.1	12
Pinus pinaster	5.6	1	58.4	2	58.4	2	25.6	3	23.9	4
Pinus pinea	9.1	1	9.1	1	9.1	1	2	1	36.1	4
Pinus radiata	8.8	2	8.8	2	8.8	2	10	1	7.4	3
Pinus sylvestris	1,608.1	17	2,443.4	18	2,673.5	20	2,580	21	4,294.8	23
Populus alba	2.3	1	2.1	1	12.1	2	13.4	6	17.8	6
Populus nigra	3.1	2	115.3	6	117.6	9	44.4	8	69.5	11
Populus tremula	3.2	2	4.5	4	31.2	5	53.3	5	22.4	5
Prunus avium	2.8	2	25.4	7	65.1	9	67.6	11	67.9	14
Pseudotsuga menziesii	108.9	9	663.9	9	258	10	318.1	14	325.6	16
Quercus cerris	-	0	-	0	-	0	6	1	3	1
Quercus ilex	-	0	-	0	-	0	2	1	292.8	2
Quercus petraea	50	5	42.7	9	70.6	11	140.7	11	258	14
Quercus pubescens	3.6	1	4.7	3	1.1	2	1	1	-	0
Quercus robur	90.2	9	480.5	16	792.5	17	481.2	17	1,184.2	18
Quercus rubra	-	0	8.4	3	8.4	3	82.2	5	70.1	6
Quercus suber	-	0	48.8	2	48.8	2	37.6	3	17.5	3
Robinia pseudoacacia	-	0	76.1	2	65.8	2	186.3	7	216.3	7
Tilia cordata	1.7	1	13	4	28.3	7	20.2	6	48.5	10
Tilia platyphyllos	-	0	2.4	1	1.3	2	-	0	17.3	2

Source: European Forest Genetic Resources Programme, Bioversity International

DATA PROVIDERS: Heino Konrad (Austria), Oleg Baranov (Belarus), Bart De Cuyper (Belgium), Dalibor Ballian (Bosnia and Herzegovina), Mariya Nikolova-Belovarska (Bulgaria), Mladen Ivankovic (Croatia), Andreas K. Christou (Cyprus), Josef Frýdl (Czech Republic), Ditte Christina Olrik (Denmark), Tiit Maaten (Estonia), Leena Yrjänä (Finland), Eric Collin (France), Irina Tvauri (Georgia), Michaela Haverkamp (Germany), Despina Paitaridou (Greece), Sándor Bordács (Hungary), Throstur Eysteinsson (Iceland), Cathal Ryan (Ireland), Fulvio Ducci (Italy), Inga Zariņa (Latvia), Patrick Insinna (Liechtenstein), Virgilijus Baliuckas (Lithuania), Thierry Palgen (Luxembourg), Duncan Borg (Malta), Sven de Vries (Netherlands), Arne Steffenrem (Norway), Jan Matras (Poland), Maria Carolina Varela (Portugal), Radu Sbirnea (Romania), Andrej Pilipović (Serbia), Dagmar Bednarova (Slovakia), Marjana Westergren (Slovenia), Eduardo Notivol Paino (Spain), Sanna Black-Samuelsson (Sweden), Peter Rotach (Switzerland), Gaye Eren Kandemir (Turkey), Svitlana Los (Ukraine) and Jason Hubert (United Kingdom).

Table 35: Ind 4.6D Areas managed for seed production by selected tree species in 1990, 2000, 2005, 2010 and 2015

Species	1990		2000		2005		2010		2015	
	ha	number countries	ha	number countries	ha	number countries	ha	number countries	ha	number countries
Abies alba	33,017	12	27,741	14	27,258	18	64,291	20	50,529	23
Abies cephalonica	0	1	2	1	1,568	2	1,568	2	1,568	2
Abies grandis	9	3	13	4	23	7	79	7	192	8
Abies pinsapo	0	1	-	0	-	0	0	1	3	2
Acer platanoides	46	5	78	9	99	11	400	12	209	16
Acer pseudoplatanus	345	9	657	14	1,644	19	25,665	18	4,655	23
Alnus glutinosa	1,448	10	1,957	15	2,198	18	3,727	20	12,585	22
Alnus incana	0	1	6	3	14	6	59	8	1,470	10
Betula pendula	1,025	9	1,485	16	1,397	17	1,345	19	10,104	20
Betula pubescens	1	3	135	8	174	9	137	8	230	9
Carpinus betulus	557	3	789	8	750	11	5,586	14	5,035	15
Castanea sativa	537	4	547	6	991	10	1,284	14	1,864	19
Cedrus atlantica	1,441	2	807	4	721	3	762	3	803	4
Cedrus libani	2,861	1	3,643	1	3,592	1	3,651	2	3,697	3
Fagus sylvatica	68,893	14	80,057	17	79,988	23	208,857	23	134,988	24
Fraxinus angustifolia	101	3	626	7	750	8	493	7	36,912	12
Fraxinus excelsior	2,628	12	3,213	20	4,175	24	14,901	23	6,404	25
Larix decidua	6,873	14	7,061	18	8,485	22	17,210	21	11,814	23
Larix x eurolepis	111	5	124	7	150	9	155	9	140	10
Larix kaempferi	201	7	172	7	167	8	838	7	200	8
Larix sibirica	49	2	183	3	84	3	139	3	62	2
Picea abies	163,798	22	153,202	21	129,816	26	151,074	26	116,407	29
Picea sitchensis	1,030	6	403	8	1,041	10	1,133	10	1,149	8
Pinus brutia	8,038	2	12,091	2	12,714	3	13,166	4	13,242	5
Pinus canariensis	-	0	-	0	108	1	146	1	24,895	3
Pinus cembra	13	3	202	6	1,729	7	2,187	7	3,874	9
Pinus contorta	191	2	950	3	965	5	2,048	5	1,061	5
Pinus halepensis	331	4	477	4	2,176	8	2,176	7	6,738	8
Pinus leucodermis	61	1	77	2	307	3	273	3	265	3
Pinus nigra	20,373	15	38,592	18	38,611	23	27,709	21	30,320	22
Pinus pinaster	1,506	3	5,730	4	7,198	6	15,075	6	17,520	8
Pinus pinea	1,496	2	4,214	3	5,841	5	5,641	5	9,142	5
Pinus radiata	40	3	5	2	155	5	231	3	223	4
Pinus sylvestris	63,132	23	77,189	25	69,536	32	81,029	31	170,404	33
Populus alba	33	4	32	4	58	5	154	4	145	6
Populus nigra	5	1	105	4	88	5	7	2	15,173	10
Populus tremula	220	4	183	7	164	6	378	6	782	7
Prunus avium	315	7	643	11	830	16	3,884	21	1,570	21
Pseudotsuga menziesii	1,835	15	2,139	19	2,079	24	5,673	27	2,510	26
Quercus cerris	2,451	3	3,143	7	3,072	9	5,191	9	5,011	11
Quercus ilex	-	0	1,855	1	3,437	3	3,157	4	7,676	6
Quercus petraea	40,609	15	41,450	17	46,982	22	93,945	23	68,579	24
Quercus pubescens	41	2	57	4	43	5	241	6	380	7
Quercus robur	18,049	18	19,186	23	19,944	28	32,499	26	65,254	27
Quercus rubra	1,020	8	1,516	17	1,630	18	2,389	16	1,945	18
Quercus suber	10	1	16,480	2	19,656	3	19,819	3	21,119	5
Robinia pseudoacacia	1,425	5	1,714	7	1,916	10	1,917	11	3,462	12
Tilia cordata	743	6	1,047	15	1,605	17	8,585	15	4,113	17
Tilia platyphyllos	154	3	737	6	608	7	731	9	257	10

Source: European Forest Genetic Resources Programme, Bioversity International

DATA PROVIDERS: Heino Konrad (Austria), Oleg Baranov (Belarus), Bart De Cuyper (Belgium), Dalibor Ballian (Bosnia and Herzegovina), Mariya Nikolova-Belovarska (Bulgaria), Mladen Ivankovic (Croatia), Andreas K. Christou (Cyprus), Josef Frýdl (Czech Republic), Ditte Christina Olrik (Denmark), Tiit Maaten (Estonia), Leena Yrjänä (Finland), Eric Collin (France), Irina Tvauri (Georgia), Michaela Haverkamp (Germany), Despina Paitaridou (Greece), Sándor Bordács (Hungary), Throstur Eysteinsson (Iceland), Cathal Ryan (Ireland), Fulvio Ducci (Italy), Inga Zariņa (Latvia), Patrick Insinna (Liechtenstein), Virgilijus Baliuckas (Lithuania), Thierry Palgen (Luxembourg), Duncan Borg (Malta), Sven de Vries (Netherlands), Arne Steffenrem (Norway), Jan Matras (Poland), Maria Carolina Varela (Portugal), Radu Sbirnea (Romania), Andrej Pilipovič (Serbia), Dagmar Bednarova (Slovakia), Marjana Westergren (Slovenia), Eduardo Notivol Paino (Spain), Sanna Black-Samuelsson (Sweden), Peter Rotach (Switzerland), Gaye Eren Kandemir (Turkey), Svitlana Los (Ukraine) and Jason Hubert (United Kingdom).

Table 36: Ind 4.8A Average volume of standing and lying deadwood in forest, 1990-2010

Country	Forest [1,000 ha]	Volume of deadwood [m³/ha]											
		total				standing				lying			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	0.01	0.5	-	-	0.01	0.5	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	13.7	17.4	20.3	3.9	5.3	6.6	7.5	-	8.4	10.8	12.8
Belarus	8,630	-	2.1	1	1.2	-	1.2	0.7	0.9	-	0.8	0.3	0.4
Belgium	681.2	-	7.1	7	7.3	-	2.8	2.8	2.9	-	4.3	4.1	4.4
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-
Croatia	1,920	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	172.8	-	-	-	-	0.7	0.9	0.9	0.9	-	-	-	-
Czech Republic	2,657.4	-	-	11.6	11.6	-	-	4.8	4.8	-	-	6.8	6.8
Denmark	587.1	0	0	5.4	5.5	-	-	2.9	4	-	-	2.5	1.5
Estonia	2,233.9	8.8	9.9	12.5	16.9	5.9	5.9	6.9	7.9	2.9	4	5.6	9
Finland	22,218	-	5.6	5.7	5.6	-	1.3	1.6	1.7	-	4.3	4	4
France	16,424	-	-	-	-	-	-	-	7	-	-	-	17
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	11.5	23.7	20.6	-	2.4	5.5	4.7	-	9.1	18.2	15.9
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	-	-	7.7	5.1	6.3	7.2	4.6	-	-	-	3
Iceland	42.7	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	725.6	-	-	6.6	7.6	-	-	2.7	3.2	-	-	4	4.3
Italy	9,028	7.3	8.3	8.7	9.2	4.5	5	5.3	5.6	2.9	3.3	3.4	3.6
Latvia	3,354	6	6	17.7	23.5	-	-	6.9	9.2	-	-	10.8	14.3
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	20	20	30
Lithuania	2,170	23	23	23	23	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	11.6	11.6	-	-	4.4	4.4	-	-	7.2	7.2	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	5.3	5.3	6.7	-	2.5	2.5	3.1	-	2.8	2.8	3.5
Netherlands	373.5	5.7	7.7	9.8	11.9	2.7	3.6	4.6	5.7	3	4.1	5.2	6.2
Norway	12,102	-	6.8	-	9.4	-	2.3	-	3.4	-	4.5	-	6
Poland	9,329	-	-	-	5.8	-	-	-	2.7	-	-	-	3.1
Portugal	3,239.1	-	-	-	-	-	-	2.7	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	22.5	21.9	21.8	22	6.8	6.6	6.6	6.7	15.8	15.4	15.3	15.3
Serbia	2,713	-	-	-	-	-	-	-	-	1.4	1.2	1.2	1.2
Slovakia	1,938.9	-	-	-	40.6	-	-	-	12.4	-	-	-	28.2
Slovenia	1,247	12.7	14.9	17	19.8	3.6	4.2	4.8	7.1	9.1	10.7	12.2	12.7
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	7.5	7.8	-	-	2.9	3.1	-	-	4.6	4.7
Switzerland	1,235	7.1	16.3	20.9	23.4	5	9.5	11.7	11.9	2.1	6.8	9.2	11.5
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	8.2	5.8	5.9	6	5.5	3.6	3.7	3.7	2.7	2.2	2.2	2.3
United Kingdom	3,059	3.9	3.9	3.9	3.9	0.8	0.8	0.8	0.8	3.1	3.1	3.1	3.1

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 37: Ind 4.8B Number of threatened forest species, according to IUCN Red List categories, 2010

Country	Forest [1,000 ha]	Net annual increment (over bark)																	
		Birds			Mammals			Other verterbrates			Other invertebrates			Vascular plants			Fungi		
		Vulnerable	Endangered	Critically endangered	Vulnerable	Endangered	Critically endangered	Vulnerable	Endangered	Critically endangered	Vulnerable	Endangered	Critically endangered	Vulnerable	Endangered	Critically endangered	Vulnerable	Endangered	Critically endangered
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	4	1	11	9	3	1	10	6	2	-	-	-	159	86	22	59	21	8
Belarus	8,630	29	18	10	9	5	-	6	4	3	56	13	6	55	51	47	47	30	28
Belgium	681.2	-	-	-	0	6	4	1	1	1	-	-	-	1	14	14	-	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	7	3	2	5	1	2	8	4	5	5	1	0	0	0	0	0	0	0
Croatia	1,920	8	7	8	3	2	0	1	0	0	2	4	4	20	5	5	151	68	38
Cyprus	172.8	0	3	0	0	1	0	0	2	0	-	-	-	59	23	10	-	-	-
Czech Republic	2,657.4	0	248	0	0	31	0	0	47	0	0	-	0	0	771	0	0	582	0
Denmark	587.1	3	12	2	7	2	0	1	4	0	113	114	81	12	28	8	222	425	136
Estonia	2,233.9	6	2	3	1	0	0	1	0	0	1	1	3	19	10	8	8	10	18
Finland	22,218	8	2	3	5	2	1	1	1	0	362	178	59	18	22	8	179	91	67
France	16,424	15	4	1	2	2	1	2	0	0	2	2	2	351	108	49	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	7	3	4	-	-	-	-	-	-	-	-	-	7	155	43	272	487	525
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	2	0	0	0	0	0	0	0	0	2	3	-	71	110	80	48	60	25
Iceland	42.7	0	0	0	0	0	0	-	-	-	-	-	-	1	0	0	-	-	-
Ireland	725.6	-	1	-	-	-	-	-	-	-	7	3	-	7	-	-	2	-	-
Italy	9,028	9	5	1	13	6	2	1	2	0	-	-	-	-	-	-	-	-	-
Latvia	3,354	10	2	7	7	1	1	1	0	1	20	11	15	31	18	27	7	6	15
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	0	0	0	1	1	0	-	-	-	4	0	0	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	12,102	7	3	0	4	2	3	0	0	0	318	210	43	27	10	6	271	166	64
Poland	9,329	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	8	9	3	12	6	2	19	10	1	403	151	78	115	72	43	49	39	7
Slovenia	1,247	20	19	-	10	9	-	22	7	-	113	99	-	-	-	-	34	47	1
Spain	18,247.2	25	-	19	12	-	5	13	-	19	10	-	11	32	-	110	-	-	-
Sweden	28,073	6	2	2	2	3	2	3	0	0	198	102	20	22	23	9	303	146	50
Switzerland	1,235	21	7	0	12	3	6	35	32	14	35	32	14	60	31	16	528	353	87
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	4	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	28	41	26	34	15	15	52	12	21	132	96	61	252	110	125	47	69	31
United Kingdom	3,059	0	0	0	0	0	0	0	0	0	19	31	1	12	11	6	42	21	15

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 38: Ind 4.9A Area of forest protected, according to MCPFE Assessment Guidelines, 1990-2015

Country	Forest [1,000 ha]	Forest area [1,000 ha]									
		MCPFE Class 1.1					MCPFE Class 1.2				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	-	8.4	8.4	-	-	-	55.2	88.6	-	-
Andorra	16	0	0	0	0	0	0	0	0	0	0
Austria	3,869	-	0	0	0	0	-	-	-	-	-
Belarus	8,633.5	-	134.8	134.8	134.8	165.8	-	133.2	134	137	163.6
Belgium	683.4	-	0	0.8	0.8	6.2	-	3.8	4.7	6.6	6.6
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	47	46	34	50	-	61	99	99	97	95
Croatia	1,922	22	33	38	44	44	3	7	8	10	10
Cyprus	172.7	0.8	3.4	3.4	3.4	3.4	2.3	10.6	13.4	13.4	13.4
Czech Republic	2,667.4	-	24.5	24.6	26	26.2	-	95.7	104	104	104.5
Denmark	612.2	0.4	0.4	0.4	0.4	0.4	0.2	6.1	8.6	6.1	7.9
Estonia	2,232	-	96.3	141	160.6	174.6	-	43.8	50.3	63	64.8
Finland	22,218	-	807	841	1,763	1,763	-	670	665	896	896
France	16,989	-	-	-	0	-	-	-	-	100.3	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	0	0	0	0	-	-	91	117	220	-
Greece	3,903	139	152	159	164	164	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	0	0	3.4	3.6	3.7	0	0	8.1	8.9	9.1
Iceland	49.1	0	0	0	0	0	0	0	0	0	0
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	-	238.1	253.7	270.5	270.5	-	1,312.2	1,398	1,490.7	1,490.7
Latvia	3,356	-	4.7	9	9.4	6.9	-	152.8	173.2	183.9	195.8
Liechtenstein	6.2	-	1.3	1.3	1.3	1.3	-	0.6	0.6	0.6	0.6
Lithuania	2,180	-	20	24	24	25	-	62	83	86	87
Luxembourg	86.8	-	-	-	-	-	0	0	0	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	3.6	11.9	11.9	-	-	9.4	31	31
Netherlands	376	-	3	3	3	3	-	24	28	31	33
Norway	12,112	0	0	0	0	0	108	158	277	428	581
Poland	9,435	30	51	54	55.6	59.6	0	0	0	0	0
Portugal	3,182.1	-	0.9	0.9	-	0.9	-	8.9	8.9	-	0
Romania	6,861	-	-	136.2	-	-	-	-	83.8	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-
Serbia	2,720	-	0	6.8	-	-	-	0	111	-	-
Slovakia	1,940	-	84.9	81.9	71	70.8	-	9.5	15.5	0	0
Slovenia	1,248	10.4	10.3	9.8	9.6	9.6	59.3	74.1	79.4	78.7	77.9
Spain	18,417.9	0	-	0	0	0	77.4	-	135.6	187.5	189.3
Sweden	28,073	124	169.2	196.3	269.7	295.8	527.1	1,498.3	1,534.7	1,584	1,595.5
Switzerland	1,254	-	-	5	5	4	-	-	20	26	20
FYROM	987.5	-	-	-	-	-	-	-	-	-	-
Turkey	11,943	18.6	21.1	22.3	18.2	14.1	113	136.6	155.1	173.6	192.1
Ukraine	9,657	-	-	-	284	290	-	-	-	229	240
United Kingdom	3,144	-	-	-	0	-	-	-	-	43	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 38: Ind 4.9A Area of forest protected, according to MCPFE Assessment Guidelines, 1990-2015 (cont.)

Country	Forest [1,000 ha]	Forest area [1,000 ha]									
		MCPFE Class 1.3					MCPFE Class 2				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	-	47.7	63.7	-	-	-	29.9	94.3	-	-
Andorra	16	0	0	0	0	0	0	0	0	0	0
Austria	3,869	-	-	-	-	-	-	-	-	-	-
Belarus	8,633.5	-	443.1	497.5	511.1	467.9	-	628	649.4	545.6	600
Belgium	683.4	-	4.5	6.8	8.6	8.8	-	27.2	27.3	26.3	26.3
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	0	1	2	8	-	23	93	145	425	-
Croatia	1,922	138	156	165	173	214	1	3	3	4	4
Cyprus	172.7	0	0	0	0	0	0	0	0	0	0
Czech Republic	2,667.4	-	32.8	35	32.4	32.4	-	562.7	588.5	588.5	588.5
Denmark	612.2	0	7.5	30.7	26.5	27.8	0	0	70.5	77.4	79.2
Estonia	2,232	-	44.5	37.7	41.1	47.8	-	124.8	201.4	197.5	177.4
Finland	22,218	-	534	705	286	286	-	579	1,026	867	867
France	16,989	-	-	-	3,415.3	-	-	-	-	2,664.4	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	-	2,048	2,690	3,086	-	-	4,686	5,273	5,958	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	64.2	149.8	226.9	649.2	650	252.1	172.9	186.1	210.4	211.7
Iceland	49.1	0	0	0	0	0	0.4	0.5	0.6	0.6	0.6
Ireland	754	4.2	6.5	6.5	6.5	6.5	-	-	-	-	-
Italy	9,297	-	1,323.7	1,410.3	1,503.8	1,503.8	-	-	897.9	897.9	897.9
Latvia	3,356	-	261.3	171.9	178.3	184.2	-	142.3	157.6	159.2	162.5
Liechtenstein	6.2	-	0	0	0	0	-	0.2	0.2	0.2	0.2
Lithuania	2,180	-	85	86	91	91	-	155	177	174	174
Luxembourg	86.8	-	-	-	-	-	0	0	0	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	120.6	120.6	0	0	0	0	0
Netherlands	376	-	23	23	23	23	-	33	33	33	33
Norway	12,112	0	0	0	0	0	53	68	166	209	301
Poland	9,435	-	226	241	243.8	240.1	-	1,346	1,403	1,308	1,307.8
Portugal	3,182.1	-	606	606	-	1,068	-	938.4	938.4	-	1.3
Romania	6,861	-	-	178.4	-	-	-	-	140.5	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-
Serbia	2,720	-	0	195	-	-	-	0	47.5	-	-
Slovakia	1,940	-	218.5	237	0	0	-	547.8	501.3	774.6	782.9
Slovenia	1,248	-	-	67.8	67.8	77.7	-	51	81.1	81.1	91.8
Spain	18,417.9	1,264.4	-	3,064.7	3,189.7	3,219.5	0	-	0	117.3	118.4
Sweden	28,073	100.9	121.3	135.6	170.6	182.6	73.7	85	86.8	92.8	94.8
Switzerland	1,254	-	-	8	11	23	-	-	254	254	222
FYROM	987.5	-	-	-	-	-	-	-	-	-	-
Turkey	11,943	556	645	682.7	877.2	1,071.7	0	0	0	0	0
Ukraine	9,657	-	-	-	588	606	19	22	80	256	260
United Kingdom	3,144	-	-	-	247	-	-	-	-	228	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 39: Ind 4.9B Area of forest and other wooded land, according to MCPFE Assessment Guidelines, 1990-2015

Country	Forest [1,000 ha]	Forest area [1,000 ha]									
		MCPFE Class 1.1					MCPFE Class 1.2				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	-	14.5	14.5	-	-	-	55.2	88.6	-	-
Andorra	16	0	0	0	0	0	0	0	0	0	0
Austria	3,869	-	0	0	0	0	-	28.1	28.1	32.2	29.8
Belarus	8,633.5	-	134.8	134.8	134.8	165.8	-	133.2	134	137	163.6
Belgium	683.4	-	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	2,115	1.4	1.4	1.4	1.4	2.8	20	20	20	39.8	39.8
Bulgaria	3,823	47	46	34	50	-	61	99	99	97	95
Croatia	1,922	25	39	46	53	53	3	7	8	10	10
Cyprus	172.7	0.8	4.8	4.8	4.8	4.8	7.4	16.7	21.6	21.6	21.6
Czech Republic	2,667.4	-	24.5	24.6	26	26.2	-	95.7	104	104	104.5
Denmark	612.2	0.4	0.4	0.4	0.4	0.4	0.4	6.3	8.8	6.3	8.2
Estonia	2,232	-	120.1	174.6	202.3	218.4	-	51	55.9	68	66.5
Finland	22,218	-	1,000	1,058	2,064	2,064	-	796	806	1,086	1,086
France	16,989	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	0	0	0	0	-	-	91	117	220	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	-	-	-	-	-	-	-	-	-	-
Iceland	49.1	0	0	0	0	0	0	0	0	0	0
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	-	-	280.8	297.7	297.7	-	-	1,556.7	1,649.3	1,649.3
Latvia	3,356	-	-	-	-	-	-	-	-	-	-
Liechtenstein	6.2	-	1.3	1.3	1.3	1.3	-	0.6	0.6	0.6	0.6
Lithuania	2,180	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	0.2	2	-	-	0	0	0	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	3.6	14.1	14.1	-	-	9.4	36.8	36.8
Netherlands	376	-	3	3	3	3	-	24	28	31	33
Norway	12,112	0	0	0	0	0	175	229	416	617	810
Poland	9,435	30	51	54	55.6	59.6	0	0	0	0	0
Portugal	3,182.1	-	1	1	-	0.9	-	8.9	8.9	-	0
Romania	6,861	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	11,696.9	12,097.6	12,325.4	-	801.2	4,080.1	4,206.1	4,387.4	-
Serbia	2,720	-	0	6.9	-	-	-	0	182	-	-
Slovakia	1,940	-	84.9	81.9	71	70.8	-	9.5	15.5	0	0
Slovenia	1,248	10.4	10.3	9.8	9.6	9.6	59.3	74.1	100.4	99.7	98.9
Spain	18,417.9	0	-	0	0	0	195.4	-	342.2	431	430.9
Sweden	28,073	127.6	172.8	200.1	273.9	300	549.3	1,563.3	1,600.6	1,650.1	1,661.8
Switzerland	1,254	-	-	5	5	4	-	-	20	26	20
FYROM	987.5	-	-	-	-	10.7	-	-	-	-	115.7
Turkey	11,943	-	-	-	-	-	-	-	-	-	-
Ukraine	9,657	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,144	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 39: Ind 4.9B Area of forest and other wooded land, according to MCPFE Assessment Guidelines, 1990-2015 (cont.)

Country	Forest [1,000 ha]	Forest area [1,000 ha]									
		MCPFE Class 1.3					MCPFE Class 2				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	-	47.7	63.7	-	-	-	29.9	94.3	-	-
Andorra	16	0	0	0	0	0	0	0	0	0	0
Austria	3,869	-	88.5	88.5	259	471.8	-	902.5	902.5	367.4	333.2
Belarus	8,633.5	-	443.1	497.5	511.1	467.9	-	628	649.4	545.6	600
Belgium	683.4	-	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	2,115	-	-	-	-	-	0	43.2	47.1	55.1	55.1
Bulgaria	3,823	0	1	2	8	-	23	93	145	425	-
Croatia	1,922	166	190	202	212	253	1	3	3	4	4
Cyprus	172.7	0	0	0	0	0	0	0	0	0	0
Czech Republic	2,667.4	-	32.8	35	32.4	32.4	-	562.7	588.5	588.5	588.5
Denmark	612.2	1.2	8.7	32	27.7	28.5	0	0	79.8	85.9	86.6
Estonia	2,232	-	45.4	38.4	42.5	49.1	-	144.5	237.9	235.8	220
Finland	22,218	-	679	788	301	301	-	593	1,209	876	876
France	16,989	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	-	2,048	2,690	3,086	-	-	4,686	5,273	5,958	-
Greece	3,903	-	-	-	-	-	-	-	33	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	-	-	-	-	-	-	-	-	-	-
Iceland	49.1	0	0	0	0	0	10	11.6	13.1	13.9	14.3
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	-	-	1,605.9	1,699.4	1,699.4	838	-	1,059.2	1,059.2	1,059.2
Latvia	3,356	-	-	-	-	-	-	-	-	-	-
Liechtenstein	6.2	-	0	0	0	0	-	0.2	0.2	0.2	0.2
Lithuania	2,180	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	0	0	0	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	141.6	141.6	0	0	0	0	0
Netherlands	376	-	23	23	23	23	-	33	33	33	33
Norway	12,112	0	0	0	0	0	59	81	212	263	366
Poland	9,435	-	226	241	243.8	240.1	-	1,346	1,403	1,308	1,307.8
Portugal	3,182.1	-	628.8	628.8	-	1,068	-	944.9	944.9	-	1.3
Romania	6,861	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	108.2	93.4	93.3	30.3	-	-	93.1	90.8	91.2	-
Serbia	2,720	-	0	196	-	-	-	0	53	-	-
Slovakia	1,940	-	218.5	237	0	0	-	547.8	501.3	774.6	782.9
Slovenia	1,248	-	-	67.8	67.8	77.7	-	51	81.1	81.1	91.8
Spain	18,417.9	2,242.5	-	4,664	4,822.5	4,840.1	0	-	0	210	210.4
Sweden	28,073	101.6	122.1	138.8	175	187.4	74.7	85.9	87.8	93.8	95.8
Switzerland	1,254	-	-	8	11	23	-	-	254	-	222
FYROM	987.5	-	-	-	-	3.4	-	-	-	-	75.8
Turkey	11,943	-	-	-	-	-	-	-	-	-	-
Ukraine	9,657	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,144	-	-	-	-	-	-	-	-	-	-

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 40: Ind 5.1 Protective forest, according to MCPFE Assessment Guidelines, 1990-2015

Country	Forest [1,000 ha]	Forest area in MCPFE Class 3 [1,000 ha]									
		For soil, water and other forest ecosystem functions					For infrastructure and managed natural resources				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	86.9	96.8	131.1	176.4	170.6	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,869	654	679	697	713	713	-	-	-	-	-
Belarus	8,633.5	622.2	1,244.5	1,286.8	1,257	1,343	19.8	44.8	41.9	31.5	35
Belgium	683.4	-	179.1	175	170.9	167.6	-	0	0	0	0
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	430	433	451	439	427	200	232	146	144	142
Croatia	1,922	51	66	73	80	71	2	2	2	2	2
Cyprus	172.7	0	0	0	0	0	0	0	0	0	0
Czech Republic	2,667.4	-	170.3	228.6	251.3	278.2	-	180	251.6	281.2	312.3
Denmark	612.2	0	0	0	0	0	0	0	0	0	0
Estonia	2,232	153.3	256	207.6	138.9	138	-	0	0	0	0
Finland	22,218	-	-	-	-	-	-	-	-	-	-
France	16,989	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	-	2,981	3,737	4,616	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	195.4	181.8	149.9	169	172.3	7.3	36.4	31.6	28.8	28.3
Iceland	49.1	10.2	12.1	13.7	15.2	17.1	0	0	0	0	0
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	6,973.2	7,427.1	7,654.1	7,889.1	8,124.1	61	61	61	61	61
Latvia	3,356	51	71	122	131	141	0	0	0	0	0
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-
Lithuania	2,180	-	217	236	222	227	-	13	22	24	24
Luxembourg	86.8	-	1.2	1.2	1.2	1.2	0	0	0	0	0
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-
Netherlands	376	-	-	-	4.5	4.5	-	-	-	0	0
Norway	12,112	-	-	-	-	-	-	-	-	-	-
Poland	9,435	1,356	1,838	2,021	2,155	2,309.2	-	915	886	836.2	843.2
Portugal	3,182.1	-	-	-	-	380.1	-	-	-	-	-
Romania	6,861	1,879	2,843	2,847	2,917	2,490	109	166	166	170	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-
Serbia	2,720	-	162	162	162	-	-	1	1	1	-
Slovakia	1,940	-	302.8	334.3	353	350.7	-	14.1	10.1	4.8	4
Slovenia	1,248	-	74	94.7	249.1	299.6	-	0.1	0.1	0.3	0.3
Spain	18,417.9	3,260.2	4,329	4,406.8	4,608.7	4,651.8	0	0	0	0	0
Sweden	28,073	-	-	-	-	-	-	-	-	-	-
Switzerland	1,254	-	-	-	14	14	-	-	-	540	548
FYROM	987.5	-	-	-	-	-	-	-	-	-	-
Turkey	11,943	931.5	1,121.1	1,362.7	1,781.2	2,039.6	167.5	188.9	83.1	207.4	259.9
Ukraine	9,657	2,870	2,349	2,349	2,388	2,388	-	811	811	688	688
United Kingdom	3,144	0	0	0	0	0	0	0	0	0	0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 41: Ind 5.2 Protective forest and OWL, according to MCPFE Assessment Guidelines, 1990-2015

Country	Forest [1,000 ha]	Forest and other wooded land in MCPFE Class 3 [1,000 ha]									
		For soil, water and other forest ecosystem functions					For infrastructure and managed natural resources				
	2015	1990	2000	2005	2010	2015	1990	2000	2005	2010	2015
Albania	785	-	134.2	167.8	212.4	205.6	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,869	746	773	801	833	833	-	165	280	377.7	385
Belarus	8,633.5	622.2	1,244.5	1,286.8	1,257	1,343	19.8	44.8	41.9	31.5	35
Belgium	683.4	-	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	2,115	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,823	430	538	478	439	427	200	232	146	144	142
Croatia	1,922	56	94	114	133	124	2	2	2	2	2
Cyprus	172.7	0	0	0	0	0	0	0	0	0	0
Czech Republic	2,667.4	-	170.3	228.6	251.3	278.2	-	180	251.6	281.2	312.3
Denmark	612.2	0	0	0	0	0	0	0	0	0	0
Estonia	2,232	-	275.7	231.6	157.9	157.4	-	0	0	0	0
Finland	22,218	-	-	-	-	-	-	-	-	-	-
France	16,989	-	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,419	-	2,981	3,737	4,616	5,500	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,069.1	-	-	-	-	-	-	-	-	-	-
Iceland	49.1	132.3	141	146.4	151.5	157.3	0	0	0	0	0
Ireland	754	-	-	-	-	-	-	-	-	-	-
Italy	9,297	7,957.6	8,486.4	8,750.9	9,019.9	9,288.3	61	61	61	61	61
Latvia	3,356	-	-	-	-	-	0	0	0	0	0
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-
Lithuania	2,180	-	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	1.2	1.2	1.2	1.2	0	0	0	0	0
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-
Netherlands	376	-	-	-	4.5	4.5	-	-	-	0	0
Norway	12,112	-	-	-	-	-	-	-	-	-	-
Poland	9,435	1,356	1,838	2,021	2,009.4	2,309.2	-	915	886	878	843.2
Portugal	3,182.1	-	-	-	-	380.1	-	-	-	-	-
Romania	6,861	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	64,079.1	70,385.8	70,555.7	74,947.7	-	84,864.5	99,572.5	99,397.8	71,342.5	-
Serbia	2,720	-	179	179	-	-	-	1.5	1.5	-	-
Slovakia	1,940	-	302.8	334.3	353	350.7	-	14.1	10.1	4.8	4
Slovenia	1,248	-	-	-	-	-	-	-	-	-	-
Spain	18,417.9	5,382.7	6,510.2	6,566.7	6,600.7	6,628.9	0	0	0	0	0
Sweden	28,073	-	-	-	-	-	-	-	-	-	-
Switzerland	1,254	-	-	-	17	17	-	-	-	552	560
FYROM	987.5	-	-	-	-	-	-	-	-	-	-
Turkey	11,943	-	-	-	-	-	-	-	-	-	-
Ukraine	9,657	2,898	2,385	2,386	2,429	2,429	-	811	811	688	688
United Kingdom	3,144	0	0	0	0	0	0	0	0	0	0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 42: Ind 6.1A Ownership of forest, 1990-2010

Country	Forest [1,000 ha]	Forest [1,000 ha]							
		Public				Private			
	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	1,045	1,024.3	1,025.1	1,014.2	0	6.8	18.5	28.8
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	874	928.5	903.5	878.5	2,363	2,331.8	2,429.6	2,527.3
Belarus	8,630	7,780	8,273	8,436	8,630	-	-	-	-
Belgium	681.2	294	290	298.7	317.2	383	377	373.9	364
Bosnia and Herzegovina	2,102.7	1,807	1,718	1,718	-	403	467	467	-
Bulgaria	3,737	3,327	3,092	3,250	3,286	0	283	401	451
Croatia	1,920	1,400	1,398	1,397	1,376	450	487	506	544
Cyprus	172.8	105.8	105.8	118.8	118.9	55.3	65.8	54	53.9
Czech Republic	2,657.4	-	-	2,105.1	2,036.7	-	-	542.3	620.7
Denmark	587.1	139.9	138	179	139.4	406.2	447.5	378.8	447.7
Estonia	2,233.9	2,205.9	899	894	922.8	0	953	978	1,038.3
Finland	22,218	6,728.4	7,213.2	6,858.8	6,744	15,168.4	15,245.4	15,303.2	15,474
France	16,424	3,755	3,967	4,062	4,064	10,681	11,322	11,799	12,360
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	5,987	5,993	5,919	5,932	4,606	4,945	5,465	5,477
Greece	3,903	2,557	2,790	2,907	2,907	742	811	845	845
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	1,792	1,141.6	1,165.5	1,178	9.2	691.3	814.2	853.1
Iceland	42.7	10.4	13.2	14.2	14.5	5.6	15.6	22.3	28.3
Ireland	725.6	353.2	399.4	400.3	386.2	111.8	235.6	294.5	339.5
Italy	9,028	2,549	2,811	2,942	3,032	5,041	5,558	5,817	5,996
Latvia	3,354	3,131	1,749	1,781	1,755	32	1,464	1,513	1,594
Liechtenstein	6.2	6	6.4	6.4	6.2	0.5	0.5	0.5	0.5
Lithuania	2,170	1,945	1,562	1,404	1,333	0	458	717	837
Luxembourg	86.8	40	41	41	41	46	46	46	46
Malta	0.3	0.3	0.3	0.3	0.3	0	0	0	0
Moldova	386	319	324	362	-	0	0	1	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	381	381	433	-	245	245	394
Netherlands	373.5	176	178.2	182	181.3	169	181.8	183	192.3
Norway	12,102	-	-	-	1,488	-	-	-	9,642
Poland	9,329	7,406	7,535	7,610	7,643	1,475	1,524	1,590	1,686
Portugal	3,239.1	52.8	54.1	54.4	98.3	3,383.2	3,288.9	3,241.6	3,140.7
Romania	6,515	6,371	6,010	5,090	4,363	0	356	1,301	2,152
Russian Federation *	809,090	884,094	880,875	881,959	882,310	0	0	-	-
Serbia	2,713	1,143	1,246	1,252	1,382	1,170	1,214	1,224	1,213
Slovakia	1,938.9	1,921.7	1,006.4	995.6	973.9	0	830	823	786
Slovenia	1,247	481.3	397.5	358.1	315.4	718.1	835.5	884.9	931.6
Spain	18,247.2	4,329.5	4,928.5	5,017.1	5,332.8	9,480	11,129.3	11,329.3	12,855.5
Sweden	28,073	-	-	6,875	6,822	-	-	21,343	21,192
Switzerland	1,235	-	-	807.4	797.3	-	-	-	-
FYROM	960.4	818	864	881	879.6	94	94	94	80.9
Turkey	11,202.8	9,607	10,168	10,651.8	11,193.1	15	15	10.2	9.9
Ukraine	9,548	9,274	9,544	9,568	8,786	-	7	7	16
United Kingdom	3,059	963	889	879	868	1,816	2,065	2,143	2,191

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 43: Ind 6.1B Ownership, number of holdings of forest, 1990-2010

Country	Forest [1,000 ha]	Forest [1,000 ha]							
		Public				Private			
	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	2,767	2,081	1,994	1,906	211,697	168,819	156,272	143,725
Belarus	8,630	117	116	117	117	-	-	-	-
Belgium	681.2	814	877	908	938	111,000	121,720	127,080	132,440
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-
Bulgaria	3,737	175	382	494	535	0	-	-	-
Croatia	1,920	527	607	655	681	600,000	600,000	600,000	600,000
Cyprus	172.8	4	4	4	4	-	-	-	-
Czech Republic	2,657.4	-	-	5,387	7,657	-	-	206,598	281,439
Denmark	587.1	344	331	331	331	20,219	26,217	26,217	26,217
Estonia	2,233.9	-	-	-	-	0	-	-	-
Finland	22,218	-	-	-	-	437,000	447,100	443,300	442,236
France	16,424	16,528	16,753	16,974	16,664	3,676,000	3,483,304	3,209,862	3,313,395
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	11,609	9,390	8,695	8,591	325,037	263,542	222,831	208,106
Greece	3,903	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	2,099	972	1,385	1,580	117	14,978	28,541	34,549
Iceland	42.7	55	58	259	261	49	187	545	613
Ireland	725.6	-	-	317	317	3,507	11,978	16,718	19,554
Italy	9,028	-	-	-	-	-	-	-	-
Latvia	3,354	-	466	6,897	-	-	99,606	173,233	148,063
Liechtenstein	6.2	15	15	-	-	584	584	-	-
Lithuania	2,170	51	51	47	47	0	134,604	213,324	277,550
Luxembourg	86.8	243	243	243	243	13,080	13,080	13,080	13,080
Malta	0.3	-	-	-	-	0	0	0	0
Moldova	386	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	18	19	20	-	-	-	-
Netherlands	373.5	2,992	2,333	2,295	2,110	34,751	29,432	29,579	27,727
Norway	12,102	-	-	-	1,339	-	-	-	151,482
Poland	9,329	-	-	2,654	2,718	-	-	1,210,421	1,122,540
Portugal	3,239.1	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	-	0	-	-	-
Russian Federation *	809,090	-	1,826	1,788	1,737	-	-	-	-
Serbia	2,713	213	207	9	-	500,000	500,000	500,000	-
Slovakia	1,938.9	-	165	197	213	0	3,658	5,075	6,346
Slovenia	1,247	-	-	-	400	-	280,735	297,319	313,014
Spain	18,247.2	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	868	938	-	-	240,141	237,934
Switzerland	1,235	-	-	2,976	2,613	-	-	-	-
FYROM	960.4	31	2	5	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-
Ukraine	9,548	607	630	684	670	-	1,435	1,435	3,208
United Kingdom	3,059	-	-	-	12,320	-	-	-	412,941

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 44: Ind 6.1C Ownership, area and number of holdings of forest in size classes, 2010

Country	Forest [1,000 ha]	Area and number of forest holdings in size classes											
		Public						Private					
		<10 ha		11-500 ha		≥500 ha		<10 ha		11-500 ha		≥500 ha	
		Area [1,000 ha]	Number of holdings	Area [1,000 ha]	Number of holdings	Area [1,000 ha]	Number of holdings	Area [1,000 ha]	Number of holdings	Area [1,000 ha]	Number of holdings	Area [1,000 ha]	Number of holdings
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	3.6	628	82.1	1,158	792.7	120	396.5	102,142	1,437	41,140	693.8	443
Belarus	8,630	-	-	-	-	-	117	-	-	-	-	-	-
Belgium	681.2	1	469	18.9	333	297.3	136	128.3	126,967	220.6	5,454	15.2	19
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	0.1	13	24	133	3,262	389	-	-	-	-	-	-
Croatia	1,920	0.04	6	30.8	131	1,345.2	544	522.3	599,953	4.2	40	17.5	7
Cyprus	172.8	0	0	0	0	118.9	4	-	-	-	-	-	-
Czech Republic	2,657.4	9	4,127	271.9	3,229	1,755.8	301	286.4	277,686	137.1	3,631	197.2	122
Denmark	587.1	2.1	96	18	202	119.3	33	165.3	21,496	185.6	4,627	96.7	94
Estonia	2,233.9	-	-	-	-	-	-	-	-	-	-	-	-
Finland	22,218	-	-	-	-	-	-	-	206,084	-	236,152	-	-
France	16,424	7	1,546	1,453	13,069	2,604	2,049	-	3,166,347	-	146,359	-	689
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	-	0	-	-	-	-	-	157,530	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	2.8	829	37.7	567	1,137.5	184	81.1	23,253	506.8	11,185	265.2	111
Iceland	42.7	-	89	-	153	-	19	-	112	-	500	-	1
Ireland	725.6	0	0	11.1	70	375.1	247	73.3	13,409	258.3	6,132	7.9	13
Italy	9,028	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	3,354	-	-	-	-	-	-	423.8	116,143	972.5	31,815	197.8	105
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	0	0	0	0	1,333	47	519	263,936	297	13,594	21	20
Luxembourg	86.8	-	118	-	110	-	15	-	12,230	-	848	-	2
Malta	0.3	-	-	-	-	0	0	0	0	0	0	0	0
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	0	0	0	0	433	20	-	-	-	-	-	-
Netherlands	373.5	21.5	1,625	23.8	205	135.7	31	57.3	23,036	45.4	1,060	89.3	40
Norway	12,102	0.9	190	109.5	846	1,377.6	303	242	56,512	6,105.3	93,271	3,294.7	1,699
Poland	9,329	5	1,171	60	1,020	7,578	527	1,286	1,109,156	263	13,355	137	29
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	0	-	3	-	1,734	-	-	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	-	53	-	96	-	64	-	2,813	-	3,263	-	270
Slovenia	1,247	0.6	353	2.1	46	312.7	1	526.4	295,572	393.9	17,422	11.2	20
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	1	93	127	454	6,694	391	447	83,161	11,431	152,590	9,314	2,183
Switzerland	1,235	-	-	237.9	2,169	559.5	444	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	7	41	90	8,745	573	16	3,208	-	-	-	-
United Kingdom	3,059	11	8,264	324	3,702	533	354	618	380,794	1,275	31,863	298	284

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 45: Ind 6.2 Contribution of forest sector to GVA, 2000-2010

Country	Forest [1,000 ha]	Gross Value Added								
		Forestry (ISIC/NACE 2)						Manufacture of wood and articles in wood (ISIC/NACE 16)		
		million Euro/ECU			% of total GVA			million Euro/ECU		
	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,860	856.4	874.9	1,080.3	0.46	0.4	0.42	1,732.9	1,891.8	2,086.1
Belarus	8,630	60.8	132.3	192	0.54	0.55	0.46	172.6	322.8	228.9
Belgium	681.2	104.9	118.7	100.8	0.05	0.04	0.03	670.9	855.6	758.4
Bosnia and Herzegovina	2,102.7	-	-	93.5	-	-	-	-	-	-
Bulgaria	3,737	26.6	40.3	89.8	0.22	0.2	0.29	24.9	76.5	94.8
Croatia	1,920	128.8	146.6	202.9	0.5	0.4	0.5	129.3	169.4	173.1
Cyprus	172.8	2.4	2.1	0.5	0.03	0.02	0	54.7	68.5	65.4
Czech Republic	2,657.4	503.9	729.4	778	0.87	0.77	0.58	478.4	817.9	910.4
Denmark	587.1	163.1	211	280.8	0.11	0.12	0.14	701.2	745.8	513.7
Estonia	2,233.9	95.7	116.5	151.5	1.74	1.17	1.18	129.7	245.3	285.8
Finland	22,218	2,236	2,096	2,764	1.94	1.53	1.78	1,396	1,361	1,220
France	16,424	2,121	2,023.4	2,045.3	0.16	0.13	0.12	3,519.1	3,171.8	3,185
Georgia	2,822.4	-	-	-	-	-	-	-	-	-
Germany	11,409	1,810	1,840	2,400	0.1	0.09	0.11	8,180	7,020	6,456.3
Greece	3,903	63.5	51.9	48.4	0.05	0.03	0.02	271.1	483.4	440.7
Holy See	0	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	142.7	158.3	183.5	0.33	0.21	0.23	218.8	264.4	224.4
Iceland	42.7	0.8	0.5	0.5	0.01	0	0.01	18.1	23.3	7.3
Ireland	725.6	90	142	163	0.08	0.1	0.12	352	451	454
Italy	9,028	497.4	525.1	608.9	0.05	0.04	0.04	5,521.9	5,581.2	5,123.5
Latvia	3,354	111	158.1	533	1.52	1.38	3.3	221.5	323.2	462.4
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-
Lithuania	2,170	64.9	94.4	139	0.53	0.45	0.5	139.9	320.3	315.7
Luxembourg	86.8	13.6	11.3	8.4	0.07	0.04	0.02	37.5	46.5	32.4
Malta	0.3	0	0	0	0	0	0	2.6	3.8	4.4
Moldova	386	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	1.6	-	-	0.06	-	-	7.2
Netherlands	373.5	42	46	59	0.01	0.01	0.01	904	1,035	1,005
Norway	12,102	584.5	597.8	611.4	0.36	0.27	0.22	678.7	922.3	865.2
Poland	9,329	647.7	674.2	1,023.5	0.39	0.31	0.33	1,182.5	1,431.3	2,040
Portugal	3,239.1	646.9	651.1	657.3	0.58	0.49	0.43	982.9	891	783.2
Romania	6,515	158.8	309.3	441	0.53	0.45	0.4	261.6	710.9	1,208.9
Russian Federation *	809,090	1,311.1	1,690.1	1,766.7	0.4	0.3	0.2	1,087.1	2,240.1	2,342.7
Serbia	2,713	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	118.8	196.4	218.2	0.85	0.57	0.33	115.2	290.9	270.1
Slovenia	1,247	93.4	119.6	167.6	0.58	0.48	0.54	161.8	210.6	201.9
Spain	18,247.2	1,440	1,603	1,012	0.25	0.2	0.1	2,487	3,028	2,537
Sweden	28,073	2,821.5	1,504	3,719.4	1.2	0.58	1.22	1,802	2,413.7	2,160.1
Switzerland	1,235	297.4	187.7	281.2	0.11	0.06	0.07	1,554.9	1,831.2	2,357.2
FYROM	960.4	-	-	22.9	-	-	0.4	-	-	9.4
Turkey	11,202.8	-	-	-	-	-	-	-	-	-
Ukraine	9,548	208.5	217.5	251.9	0.72	0.35	0.26	-	-	-
United Kingdom	3,059	436.1	475	382.6	0.03	0.03	0.03	3,623	3,975	2,758.1

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 45: Ind 6.2 Contribution of forest sector to GVA, 2000-2010 (cont.)

Country	Forest [1,000 ha]	Gross Value Added								
		Forestry (ISIC/NACE 2)			Manufacture of paper and paper products (ISIC/NACE 17)					
		% of total GVA			million Euro/ECU			% of total GVA		
	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,860	0.92	0.86	0.81	1,800.2	1,684.6	1,681.9	0.96	0.76	0.65
Belarus	8,630	1.52	1.33	0.55	-	-	237	-	-	0.57
Belgium	681.2	0.3	0.32	0.24	1,239.8	1,117.5	982.9	0.55	0.41	0.31
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	0.2	0.39	0.31	18.9	64.5	135.6	0.15	0.33	0.44
Croatia	1,920	0.6	0.5	0.4	95.1	109.9	101.6	0.4	0.3	0.2
Cyprus	172.8	0.59	0.56	0.42	19.2	21.2	19.8	0.21	0.17	0.13
Czech Republic	2,657.4	0.83	0.87	0.67	368.5	500.2	591.9	0.64	0.53	0.44
Denmark	587.1	0.47	0.43	0.25	542.7	448.1	371	0.36	0.26	0.18
Estonia	2,233.9	2.35	2.46	2.22	19.2	26.1	58.5	0.35	0.26	0.45
Finland	22,218	1.21	1	0.78	5,507	3,565	2,875	4.78	2.61	1.85
France	16,424	0.27	0.21	0.18	5,486.3	5,006.3	4,306.3	0.43	0.33	0.25
Georgia	2,822.4	-	-	-	-	-	-	-	-	-
Germany	11,409	0.44	0.35	0.29	9,810	10,100	9,650	0.53	0.5	0.43
Greece	3,903	0.22	0.28	0.23	380.4	291.8	304.4	0.31	0.17	0.16
Holy See	0	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	0.51	0.35	0.28	158.7	237.6	295.4	0.37	0.31	0.36
Iceland	42.7	0.23	0.21	0.09	10.9	21.2	1.3	0.14	0.08	0.02
Ireland	725.6	0.3	0.32	0.27	267	227	194	0.23	0.16	0.12
Italy	9,028	0.52	0.43	0.37	4,874.1	4,820.5	5,047.6	0.46	0.37	0.36
Latvia	3,354	3.03	2.82	2.86	26.2	31	34.7	0.36	0.27	0.21
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-
Lithuania	2,170	1.13	1.53	1.14	36.8	59.7	103.4	0.3	0.28	0.37
Luxembourg	86.8	0.19	0.17	0.09	-	-	-	-	-	-
Malta	0.3	0.07	0.09	0.08	7.9	7.5	6.4	0.2	0.18	0.12
Moldova	386	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	0.28	-	-	4	-	-	0.15
Netherlands	373.5	0.24	0.23	0.19	1,551	1,593	1,380	0.42	0.35	0.3
Norway	12,102	0.42	0.42	0.31	791.4	563.3	325.3	0.49	0.26	0.12
Poland	9,329	0.72	0.67	0.65	858.6	1,147.4	1,568	0.52	0.53	0.5
Portugal	3,239.1	0.88	0.67	0.52	865.5	800.4	979.9	0.78	0.6	0.65
Romania	6,515	0.87	1.03	1.1	119.6	215.6	261.6	0.4	0.31	0.24
Russian Federation *	809,090	0.3	0.4	0.3	1,128.1	1,524	1,630.8	0.3	0.3	0.2
Serbia	2,713	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	0.83	1.09	0.41	153.6	154.2	187.3	1.1	0.58	0.28
Slovenia	1,247	1	0.84	0.65	134.8	170.9	145	0.83	0.68	0.47
Spain	18,247.2	0.44	0.37	0.26	2,909	3,128	3,086	0.51	0.38	0.32
Sweden	28,073	0.77	0.93	0.71	5,165	3,455.5	3,486.7	2.2	1.33	1.14
Switzerland	1,235	0.6	0.63	0.6	943.4	914.4	954.9	0.36	0.31	0.24
FYROM	960.4	-	-	0.16	-	-	18.3	-	-	0.32
Turkey	11,202.8	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	0.25	0.24	0.18	6,149.2	5,269.1	4,117.4	0.43	0.31	0.27

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 46: Ind 6.3 Factor income and entrepreneurial income, 1990-2010

Country	Forest [1,000 ha]	Forestry (ISIC/NACE 2) [million Euro/ECU]							
		Factor income				Net entrepreneurial income			
	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	1.3	1.6	1.3	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	839.4	708.7	691.5	873.7	682.9	538.7	502.5	648.5
Belarus	8,630	-	-	-	-	-	-	-	-
Belgium	681.2	-	91.5	-	-	-	84	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	70.3	-	-	-	0.7
Bulgaria	3,737	-	-	76.6	195.9	-	-	43.9	132.1
Croatia	1,920	-	-	-	-	-	-	-	-
Cyprus	172.8	-	-	-	-	-	-	-	-
Czech Republic	2,657.4	-	-	444.9	584.1	-	-	239.6	323.2
Denmark	587.1	147.2	201.6	167.8	253.6	169.2	231.9	192.9	270.4
Estonia	2,233.9	-	85.2	92.6	120	-	51.4	42.2	60.2
Finland	22,218	2,098.8	1,855	1,712	2,334	1,602.4	1,537	1,326	1,813
France	16,424	2,146	1,847.8	2,076.1	1,829.1	1,584.4	1,127.6	1,343.1	977.1
Georgia	2,822.4	-	-	-	-	-	-	-	-
Germany	11,409	-	1,099.9	1,700.3	2,247.6	-	-131.1	51.4	1,259
Greece	3,903	130.8	85.8	53.8	27.5	-	-	25.4	-1.5
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	67.3	114.7	141.2	-	56.9	103.2	129.9
Iceland	42.7	-	0.8	0.5	0.8	-	-	-	-
Ireland	725.6	-	-	-	-	-	-	-	-
Italy	9,028	290.4	306.4	390.7	406.3	-	-	-	-
Latvia	3,354	-	-	-	482.5	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	112.5	-	-	-	79.1	-
Luxembourg	86.8	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-
Netherlands	373.5	32	32	44	66	3	-7.1	-5.1	7.1
Norway	12,102	-	-	-	483	-	-	-	-0.2
Poland	9,329	-	-	-	-	-	34.5	31.5	97.5
Portugal	3,239.1	354.6	763.5	566.8	573.8	305.5	695.9	457.4	452.8
Romania	6,515	-	-	-	375	-	-	-	94.8
Russian Federation *	809,090	-	83.8	314.6	499.5	-	-	-	-
Serbia	2,713	-	-	-	-	-	-	-	-
Slovakia	1,938.9	-	77	143.8	174.3	-	11.4	30.9	50.5
Slovenia	1,247	-	52.6	99.5	166.3	-	-	25.3	-
Spain	18,247.2	834.9	863	998.1	-	575.4	486.9	621	-
Sweden	28,073	1,783.7	1,763.3	-	3,036.1	838.9	1,090.4	-	-
Switzerland	1,235	404.8	337.2	153.2	198.4	107.2	-13.7	-98.9	-83.9
FYROM	960.4	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-
United Kingdom	3,059	136.7	327.1	220.6	160.5	-142.8	8.7	-69.1	-152.3

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 47: Ind 6.4 Government expenditures for forest services, 2000-2010

Country	Forest [1,000 ha]	Government expenditures for forest services [million Euro/ECU]											
		Total expenditures			Gross expenditure on public forests			Transfer payments to private sector			Cost of forest administration		
	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Albania	776	3.40	5.23	5.17	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	115.27	-	-	-	-	35.12	36.37	45.20	-	78.90	-
Belarus	8,630	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	21.16	33.65	21.18	-	-	-	-	-	-	-	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	42.98	46.52	26.08	-	-	-	-	-	-	-	-	-
Croatia	1,920	-	0.64	13.76	-	-	-	-	-	8.87	-	-	-
Cyprus	172.8	10.60	17.98	38.21	-	-	-	0.00	0.00	0.01	-	-	-
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-	-	-	-
Denmark	587.1	86.84	34.58	25.76	-	-	-	-	-	-	-	-	-
Estonia	2,233.9	-	2.96	4.65	-	-	-	0.30	1.12	2.35	-	-	-
Finland	22,218	-	-	-	-	-	-	-	-	-	-	-	-
France	16,424	419.00	507.00	487.00	-	221.00	223.00	-	253.00	209.00	-	33.00	55.00
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	192.00	127.00	106.00	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	119.08	153.90	199.71	93.62	112.36	134.22	15.43	25.75	54.41	10.03	15.78	11.09
Iceland	42.7	6.69	11.23	6.50	-	-	-	1.72	1.65	1.70	-	-	-
Ireland	725.6	-	116.74	123.11	-	-	3.45	-	-	113.25	-	-	6.30
Italy	9,028	320.50	260.00	295.00	190.50	140.00	170.00	60.00	70.00	85.00	70.00	50.00	40.00
Latvia	3,354	-	-	-	-	-	-	-	1.60	0.56	14.61	16.71	12.57
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	3.36	3.77	7.36	-	-	-	-	-	-	-	-	-
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	6.48	-	-	1.57	-	-	-	-	-	4.91
Netherlands	373.5	45.55	67.00	71.71	-	-	61.29	-	-	10.42	-	-	-
Norway	12,102	-	25.31	36.95	-	-	-	-	-	-	-	-	-
Poland	9,329	60.52	73.36	122.75	-	-	-	-	29.46	33.15	-	-	-
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	6.22	26.61	35.19	6.22	26.31	34.68	-	0.29	0.51	-	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	6.50	98.29	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	13.46	8.42	44.21	7.14	4.46	14.74	3.72	0.66	25.39	2.60	3.30	4.08
Slovenia	1,247	16.03	19.28	29.91	-	-	-	1.56	1.51	7.65	14.47	17.77	22.26
Spain	18,247.2	-	1,021.79	1,552.08	-	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	-	-	-	-	55.12	112.65	96.70	59.53	59.45	65.02
Switzerland	1,235	-	314.12	418.74	-	246.36	310.14	-	-	-	-	-	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	265.64	368.00	381.79	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	405.08	401.03	380.93	233.93	255.29	243.49	69.34	70.59	77.91	101.80	75.00	59.53

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 47: Ind 6.4 Government expenditures for forest services, 2000-2010 (cont.)

Country	Forest [1,000 ha]	Government expenditures for forest services [million Euro/ECU]								
		Total revenue			Gross revenue from public forests			All other government revenues from forestry and forest products		
	2010	2000	2005	2010	2000	2005	2010	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-
Austria	3,860	-	-	-	15.50	19.50	26.00	-	-	-
Belarus	8,630	-	-	-	-	-	-	-	-	-
Belgium	681.2	48.3	70.7	95.72	-	-	-	-	-	-
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	38.4	36.8	35.79	-	-	-	-	-	-
Croatia	1,920	0.5	0.6	1.52	0.49	0.64	1.52	-	-	-
Cyprus	172.8	0.6	0.3	0.54	0.57	0.35	0.54	-	-	-
Czech Republic	2,657.4	-	-	-	-	-	-	-	-	-
Denmark	587.1	33.5	31.9	30.43	-	-	-	-	-	-
Estonia	2,233.9	-	-	-	9.33	11.38	3.24	-	-	-
Finland	22,218	-	-	-	-	-	-	-	-	-
France	16,424	-	-	-	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-
Germany	11,409	-	-	-	-	-	-	-	-	-
Greece	3,903	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	204.5	234.5	299.77	122.02	147.81	185.00	82.46	86.71	114.77
Iceland	42.7	1.4	1.6	1.70	1.35	1.47	1.62	0.05	0.18	0.08
Ireland	725.6	-	-	-	-	-	-	-	-	-
Italy	9,028	-	-	-	-	-	-	-	-	-
Latvia	3,354	-	-	69.48	-	-	-	-	-	-
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-
Lithuania	2,170	17.3	25.9	39.24	13.56	15.84	24.10	3.76	10.05	15.15
Luxembourg	86.8	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	5.14	-	-	4.73	-	-	0.41
Netherlands	373.5	-	-	-	-	-	-	-	-	-
Norway	12,102	-	-	-	-	-	-	-	-	-
Poland	9,329	25.7	35.9	48.73	20.42	25.68	30.68	5.29	10.25	18.05
Portugal	3,239.1	-	-	-	-	-	-	-	-	-
Romania	6,515	-	-	-	-	-	-	-	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-
Serbia	2,713	-	8.1	99.03	-	-	-	-	-	-
Slovakia	1,938.9	1.4	1.5	2.63	0.94	1.03	1.57	0.44	0.50	1.06
Slovenia	1,247	10.8	23.5	38.35	2.59	4.46	7.42	8.18	19.04	30.93
Spain	18,247.2	-	-	-	-	-	-	-	-	-
Sweden	28,073	-	-	-	-	-	-	-	-	-
Switzerland	1,235	-	278.2	394.53	-	135.00	197.38	-	78.25	112.39
FYROM	960.4	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	408.5	522.2	785.18	-	-	-	-	-	-
Ukraine	9,548	148.5	312.4	562.47	-	-	-	-	-	-
United Kingdom	3,059	202.6	189.7	198.26	173.28	155.29	170.81	29.34	34.41	27.44

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 48: Ind 6.5. A Employment by age, job characteristics and education 2010

Country	Forest [1,000 ha]	Employment											
		Forestry (ISIC/NACE 2)						Manufacture of wood and articles in wood (ISIC/NACE 16)					
		Total [thousand FTE]	Age group, 15-49	Employees	Education (Categories ISCED 1997)			Total [thousand FTE]	Age group, 15-49	Employees	Education (Categories ISCED 1997)		
					0-2	3-4	5-6				0-2	3-4	5-6
		% of total						% of total					
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	856.4	874.9	1,080.3	0.46	0.4	0.42	1,732.9	1,891.8	2,086.1	0.92	0.86	0.81
Belarus	8,630	60.8	132.3	192	0.54	0.55	0.46	172.6	322.8	228.9	1.52	1.33	0.55
Belgium	681.2	104.9	118.7	100.8	0.05	0.04	0.03	670.9	855.6	758.4	0.3	0.32	0.24
Bosnia and Herzegovina	2,102.7	-	-	93.5	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	26.6	40.3	89.8	0.22	0.2	0.29	24.9	76.5	94.8	0.2	0.39	0.31
Croatia	1,920	128.8	146.6	202.9	0.5	0.4	0.5	129.3	169.4	173.1	0.6	0.5	0.4
Cyprus	172.8	2.4	2.1	0.5	0.03	0.02	0	54.7	68.5	65.4	0.59	0.56	0.42
Czech Republic	2,657.4	503.9	729.4	778	0.87	0.77	0.58	478.4	817.9	910.4	0.83	0.87	0.67
Denmark	587.1	163.1	211	280.8	0.11	0.12	0.14	701.2	745.8	513.7	0.47	0.43	0.25
Estonia	2,233.9	95.7	116.5	151.5	1.74	1.17	1.18	129.7	245.3	285.8	2.35	2.46	2.22
Finland	22,218	2,236	2,096	2,764	1.94	1.53	1.78	1,396	1,361	1,220	1.21	1	0.78
France	16,424	2,121	2,023.4	2,045.3	0.16	0.13	0.12	3,519.1	3,171.8	3,185	0.27	0.21	0.18
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	1,810	1,840	2,400	0.1	0.09	0.11	8,180	7,020	6,456.3	0.44	0.35	0.29
Greece	3,903	63.5	51.9	48.4	0.05	0.03	0.02	271.1	483.4	440.7	0.22	0.28	0.23
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	142.7	158.3	183.5	0.33	0.21	0.23	218.8	264.4	224.4	0.51	0.35	0.28
Iceland	42.7	0.8	0.5	0.5	0.01	0	0.01	18.1	23.3	7.3	0.23	0.21	0.09
Ireland	725.6	90	142	163	0.08	0.1	0.12	352	451	454	0.3	0.32	0.27
Italy	9,028	497.4	525.1	608.9	0.05	0.04	0.04	5,521.9	5,581.2	5,123.5	0.52	0.43	0.37
Latvia	3,354	111	158.1	533	1.52	1.38	3.3	221.5	323.2	462.4	3.03	2.82	2.86
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	64.9	94.4	139	0.53	0.45	0.5	139.9	320.3	315.7	1.13	1.53	1.14
Luxembourg	86.8	13.6	11.3	8.4	0.07	0.04	0.02	37.5	46.5	32.4	0.19	0.17	0.09
Malta	0.3	0	0	0	0	0	0	2.6	3.8	4.4	0.07	0.09	0.08
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	1.6	-	-	0.06	-	-	7.2	-	-	0.28
Netherlands	373.5	42	46	59	0.01	0.01	0.01	904	1,035	1,005	0.24	0.23	0.19
Norway	12,102	584.5	597.8	611.4	0.36	0.27	0.22	678.7	922.3	865.2	0.42	0.42	0.31
Poland	9,329	647.7	674.2	1,023.5	0.39	0.31	0.33	1,182.5	1,431.3	2,040	0.72	0.67	0.65
Portugal	3,239.1	646.9	651.1	657.3	0.58	0.49	0.43	982.9	891	783.2	0.88	0.67	0.52
Romania	6,515	158.8	309.3	441	0.53	0.45	0.4	261.6	710.9	1,208.9	0.87	1.03	1.1
Russian Federation *	809,090	1,311.1	1,690.1	1,766.7	0.4	0.3	0.2	1,087.1	2,240.1	2,342.7	0.3	0.4	0.3
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	118.8	196.4	218.2	0.85	0.57	0.33	115.2	290.9	270.1	0.83	1.09	0.41
Slovenia	1,247	93.4	119.6	167.6	0.58	0.48	0.54	161.8	210.6	201.9	1	0.84	0.65
Spain	18,247.2	1,440	1,603	1,012	0.25	0.2	0.1	2,487	3,028	2,537	0.44	0.37	0.26
Sweden	28,073	2,821.5	1,504	3,719.4	1.2	0.58	1.22	1,802	2,413.7	2,160.1	0.77	0.93	0.71
Switzerland	1,235	297.4	187.7	281.2	0.11	0.06	0.07	1,554.9	1,831.2	2,357.2	0.6	0.63	0.6
FYROM	960.4	-	-	22.9	-	-	0.4	-	-	9.4	-	-	0.16
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	208.5	217.5	251.9	0.72	0.35	0.26	-	-	-	-	-	-
United Kingdom	3,059	436.1	475	382.6	0.03	0.03	0.03	3,623	3,975	2,758.1	0.25	0.24	0.18

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 48: Ind 6.5. A Employment by age, job characteristics and education 2010 (cont.)

Country	Forest [1,000 ha]	Employment					
		Manufacture of paper and paper products (ISIC/NACE 17)					
		Total [thousand FTE]	Age group, 15-49	Employees	Education (Categories ISCED 1997)		
					0-2	3-4	5-6
			% of total				
Albania	776	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-
Austria	3,860	1,800.2	1,684.6	1,681.9	0.96	0.76	0.65
Belarus	8,630	-	-	237	-	-	0.57
Belgium	681.2	1,239.8	1,117.5	982.9	0.55	0.41	0.31
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-
Bulgaria	3,737	18.9	64.5	135.6	0.15	0.33	0.44
Croatia	1,920	95.1	109.9	101.6	0.4	0.3	0.2
Cyprus	172.8	19.2	21.2	19.8	0.21	0.17	0.13
Czech Republic	2,657.4	368.5	500.2	591.9	0.64	0.53	0.44
Denmark	587.1	542.7	448.1	371	0.36	0.26	0.18
Estonia	2,233.9	19.2	26.1	58.5	0.35	0.26	0.45
Finland	22,218	5,507	3,565	2,875	4.78	2.61	1.85
France	16,424	5,486.3	5,006.3	4,306.3	0.43	0.33	0.25
Georgia	2,822.4	-	-	-	-	-	-
Germany	11,409	9,810	10,100	9,650	0.53	0.5	0.43
Greece	3,903	380.4	291.8	304.4	0.31	0.17	0.16
Holy See	0	-	-	-	-	-	-
Hungary	2,046.4	158.7	237.6	295.4	0.37	0.31	0.36
Iceland	42.7	10.9	21.2	1.3	0.14	0.08	0.02
Ireland	725.6	267	227	194	0.23	0.16	0.12
Italy	9,028	4,874.1	4,820.5	5,047.6	0.46	0.37	0.36
Latvia	3,354	26.2	31	34.7	0.36	0.27	0.21
Liechtenstein	6.2	-	-	-	-	-	-
Lithuania	2,170	36.8	59.7	103.4	0.3	0.28	0.37
Luxembourg	86.8	-	-	-	-	-	-
Malta	0.3	7.9	7.5	6.4	0.2	0.18	0.12
Moldova	386	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-
Montenegro	826.8	-	-	4	-	-	0.15
Netherlands	373.5	1,551	1,593	1,380	0.42	0.35	0.3
Norway	12,102	791.4	563.3	325.3	0.49	0.26	0.12
Poland	9,329	858.6	1,147.4	1,568	0.52	0.53	0.5
Portugal	3,239.1	865.5	800.4	979.9	0.78	0.6	0.65
Romania	6,515	119.6	215.6	261.6	0.4	0.31	0.24
Russian Federation *	809,090	1,128.1	1,524	1,630.8	0.3	0.3	0.2
Serbia	2,713	-	-	-	-	-	-
Slovakia	1,938.9	153.6	154.2	187.3	1.1	0.58	0.28
Slovenia	1,247	134.8	170.9	145	0.83	0.68	0.47
Spain	18,247.2	2,909	3,128	3,086	0.51	0.38	0.32
Sweden	28,073	5,165	3,455.5	3,486.7	2.2	1.33	1.14
Switzerland	1,235	943.4	914.4	954.9	0.36	0.31	0.24
FYROM	960.4	-	-	18.3	-	-	0.32
Turkey	11,202.8	-	-	-	-	-	-
Ukraine	9,548	-	-	-	-	-	-
United Kingdom	3,059	6,149.2	5,269.1	4,117.4	0.43	0.31	0.27

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 49: Ind 6.5B Employment, total and by gender, 1990-2010

Country	Forest [1,000 ha]	Employment									
		Forestry (ISIC/NACE 2)					Manufacture of wood and articles in wood (ISIC/NACE 16)				
		Total [thousand FTE]				Male [% of total]	Total [thousand FTE]				Male [% of total]
	2010	1990	2000	2005	2010	2010	1990	2000	2005	2010	2010
Albania	776	2.06	1.37	1.06	1.03	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,860	-	6.7	9.58	12.26	82	-	34.78	40.79	23.65	81.4
Belarus	8,630	-	-	-	-	-	-	-	-	-	-
Belgium	681.2	2.39	2	1.65	2.8	88.8	19.7	18.21	25.6	24.05	92
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	26.18	21.27	20.14	78.9	-	24.21	26.43	22.93	78.1
Croatia	1,920	-	-	-	-	-	-	-	-	-	-
Cyprus	172.8	-	0.71	0.75	0.96	86.8	-	2.78	3.05	2.83	88.4
Czech Republic	2,657.4	55.41	30.32	21.3	14.71	85.5	-	65	65.95	47.77	82.4
Denmark	587.1	3.75	2.28	2.04	1.81	86.3	13.49	17.76	13.17	11.11	82.6
Estonia	2,233.9	10	9.2	6.6	5.6	89.3	6.5	19.2	22.9	13.7	75.9
Finland	22,218	-	24.67	22.92	22.79	87.7	-	33.62	32.19	25.67	82.7
France	16,424	42.76	35.11	36.49	31.66	81.4	107.68	112.43	90.37	85.44	79.9
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,409	65.06	51.14	40.52	41.8	86.9	-	239.79	161.61	122.49	80.6
Greece	3,903	8.6	8.58	4.24	5.29	85.5	28.93	31.94	33.61	24.73	94.4
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	24.29	18.11	15.07	16.26	84.3	-	39.28	37.52	23.54	85.2
Iceland	42.7	0.12	0.12	0.15	0.14	123	-	0.71	0.75	0.2	94.1
Ireland	725.6	2.42	2.88	2.31	2.41	92.1	7.08	8.11	7.79	7.65	88.6
Italy	9,028	49.62	42.54	43.33	44.87	87.4	206.92	181.83	172.94	153.85	85.8
Latvia	3,354	-	21.77	31.15	17.18	87.5	-	21.4	34.98	23.83	77
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	11.76	9.62	9.07	80.9	-	23.97	35.69	23.76	79.2
Luxembourg	86.8	0.28	0.13	0.15	0.22	96.2	0.44	0.22	0.17	0.16	68.6
Malta	0.3	-	-	-	-	-	-	0.31	0.3	0.21	98.4
Moldova	386	4.6	3.2	3.8	4.2	78.6	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	0.4	0.43	83.7	-	0.31	0.2	0.16	100
Netherlands	373.5	1.8	1.46	1.45	1.63	87.1	22.29	21.75	19.27	19.85	88.4
Norway	12,102	-	5.49	4.14	3.66	88.1	-	15.2	16.55	13.1	84.4
Poland	9,329	-	-	58.27	63.73	84.2	-	-	180.67	175.62	84.4
Portugal	3,239.1	8.24	3.96	10.45	5.91	195.6	59.61	69.73	70.99	47	80.7
Romania	6,515	-	57.28	49.06	50.99	92.5	-	105.31	132.64	79.71	80.8
Russian Federation *	809,090	185	201	170	74	-	-	390.4	357.6	340.5	-
Serbia	2,713	-	8.1	6.5	7.6	-	-	1.9	1.1	2.4	-
Slovakia	1,938.9	-	24.39	23.11	19.24	89.8	-	36.23	33.82	26.6	83.9
Slovenia	1,247	-	3.56	2.87	3.37	82.2	-	16.49	14.05	10.54	74
Spain	18,247.2	29.01	34.94	36.43	30.77	89.3	81.39	110.86	119.12	72.34	88.2
Sweden	28,073	-	19.49	22.43	28.08	89.9	-	40.48	37.79	34.9	83.1
Switzerland	1,235	-	3.71	5.75	8.38	74.3	-	42.25	38.49	39.87	90.3
FYROM	960.4	-	-	4.5	3.7	73.4	-	-	2.71	3.27	91
Turkey	11,202.8	-	-	41.33	45.31	84.2	-	-	130.72	111.72	94.2
Ukraine	9,548	-	-	98.2	69.8	17.3	-	70.4	61.3	42.7	-
United Kingdom	3,059	17.44	15.76	13.65	19.76	90.8	120.55	83.39	87.44	72.02	86.8

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 49: Ind 6.5B Employment, total and by gender, 1990-2010 (cont.)

Country	Forest [1,000 ha]	Employment				
		Manufacture of paper and paper products (ISIC/NACE 17)				
		Total [thousand FTE]				Male [% of total]
	2010	1990	2000	2005	2010	2010
Albania	776	-	-	-	-	-
Andorra	16	-	-	-	-	-
Austria	3,860	-	19.71	17.87	17.81	77.3
Belarus	8,630	-	-	-	-	-
Belgium	681.2	17.25	17.93	15.93	15.63	75.9
Bosnia and Herzegovina	2,102.7	-	-	-	-	-
Bulgaria	3,737	-	12.42	11.18	11.06	57.5
Croatia	1,920	-	-	-	-	-
Cyprus	172.8	-	0.54	0.54	0.73	42.7
Czech Republic	2,657.4	-	24.58	25.78	23.65	57.6
Denmark	587.1	10.15	7.43	7.67	5.95	69
Estonia	2,233.9	2.7	2	1.7	1.1	36.4
Finland	22,218	-	40.35	35.75	20.91	76.2
France	16,424	108.5	105.66	83.2	67.59	76.7
Georgia	2,822.4	-	-	-	-	-
Germany	11,409	-	151.72	147.24	146.44	74.7
Greece	3,903	9.37	8.88	8.3	8.84	75.5
Holy See	0	-	-	-	-	-
Hungary	2,046.4	-	11.64	13.8	13.62	45.7
Iceland	42.7	-	0.02	0.02	0.03	-
Ireland	725.6	3.36	3.77	2.86	2.15	71.4
Italy	9,028	89.96	101.47	89.85	88.8	78.4
Latvia	3,354	-	1.62	1.31	1.39	54.1
Liechtenstein	6.2	-	-	-	-	-
Lithuania	2,170	-	4	2.79	2.93	51.6
Luxembourg	86.8	-	-	0.03	0.02	-
Malta	0.3	-	0.5	0.23	0.18	88.1
Moldova	386	-	-	-	-	-
Monaco	0	-	-	-	-	-
Montenegro	826.8	-	-	0.21	0.25	100
Netherlands	373.5	27.03	27.5	24.67	17.43	83.2
Norway	12,102	-	11.36	7.16	5.84	78.2
Poland	9,329	-	-	47.53	53.44	64.3
Portugal	3,239.1	16.92	12.48	14.91	10.64	104.5
Romania	6,515	-	25.69	19.07	12.34	55.5
Russian Federation *	809,090	-	415	393.1	398.9	-
Serbia	2,713	-	-	-	-	-
Slovakia	1,938.9	-	13.81	9.21	8.8	73.1
Slovenia	1,247	-	6.91	8.31	4.54	63.9
Spain	18,247.2	40.84	50.27	48.01	43.98	75.9
Sweden	28,073	-	41.75	36.04	31.71	78.8
Switzerland	1,235	-	12.14	12.12	9.31	74.1
FYROM	960.4	-	-	1.25	1.17	70.7
Turkey	11,202.8	-	-	43.9	58.49	85.9
Ukraine	9,548	-	29.8	28.8	40.7	-
United Kingdom	3,059	125.56	112.59	92.95	62.19	78.3

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 50: Ind 6.6 Occupational accidents, 1990-2010

Country	Forest [1,000 ha]	Forestry (ISIC/NACE 02)															
		Fatal occupational accidents								Non-fatal occupational accidents							
		Number				Annual rate per 1,000 workers				Number				Annual rate per 1,000 workers			
	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010	1990	2000	2005	2010
Albania	776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Austria	3,860	30.2	22.8	28.4	24.6	-	1.24	1.4	1.17	4,667.6	2,015.4	1,867	1,576	-	109.9	92.06	74.72
Belarus	8,630	-	5	4	10	-	0.16	0.13	0.28	-	42	30	14	-	1.4	1	0.39
Belgium	681.2	-	0	0	0	-	0	0	0	-	112	62	50	-	56	37.64	17.84
Bosnia and Herzegovina	2,102.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulgaria	3,737	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Croatia	1,920	-	3.2	1.4	1.5	-	0.34	0.14	0.16	-	591.8	464.4	306.5	-	63.79	47.82	33.01
Cyprus	172.8	-	0	0.2	0	-	0	0.24	0	-	6.2	13.2	10.8	-	9.25	15.85	11.44
Czech Republic	2,657.4	-	6.2	6	5.8	-	0.21	0.28	0.39	-	1,228.33	850.2	455.2	-	41.2	40.29	30.39
Denmark	587.1	-	-	-	-	0	0	0	0	-	52.5	48.5	45.5	-	0.01	0.01	0.01
Estonia	2,233.9	-	2.6	0	0.4	-	0.3	0	0.06	-	78	24.2	16.4	-	8.4	3.3	2.6
Finland	22,218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
France	16,424	8.6	12	6.4	6	0.46	0.69	0.38	0.36	3,601	3,146	2,093	1,607	184	181	123	104
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Germany	11,409	46	32	44	43	-	-	0.04	0.02	13,502	10,847	10,463	11,183	-	-	64.7	65.6
Greece	3,903	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	-	4.33	4.2	4	-	0.24	0.28	0.25	-	243.5	135.8	133.2	-	13.44	9.01	8.19
Iceland	42.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	725.6	-	0	1	1	-	0	0.43	0.41	-	22	14	8	-	7.65	6.05	3.31
Italy	9,028	-	9	4	7	-	0.21	0.09	0.16	-	3,331	2,320	2,339	-	78.31	53.55	52.13
Latvia	3,354	-	-	1	6	-	-	0.03	0.08	-	-	51	20	-	-	1.64	0.27
Liechtenstein	6.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	2,170	-	-	4	2	-	-	1	-	-	-	29	25	-	-	15	13
Luxembourg	86.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	373.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	12,102	8.6	1.6	0.4	0.4	-	0.3	0.1	0.1	68.2	42.2	23.2	12.3	-	7.7	5.7	3.4
Poland	9,329	-	2	3.8	2.2	-	0.06	0.14	0.09	-	331.3	297.2	281.4	-	11.1	10.9	11.6
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	6,515	-	29.8	35.8	28	-	0.65	0.89	0.82	-	185.2	79.8	70.5	-	4.04	1.99	2.06
Russian Federation *	809,090	-	-	321	-	-	-	0.4	-	-	-	1,249	-	-	-	1.4	-
Serbia	2,713	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	1,938.9	-	6	4.5	1	-	0.24	0.19	0.5	-	515.75	157.25	90	-	21.15	6.8	4.67
Slovenia	1,247	1.2	0.8	1.4	1	0.21	0.4	0.7	0.52	439	211	182	177	76.3	108.03	90.53	92.61
Spain	18,247.2	-	13	7	8	-	0.37	0.19	0.26	-	4,401	3,329	3,383	-	125.94	91.38	109.96
Sweden	28,073	1	5	5	2	0	0.3	0.3	0.1	1,197	185	171	120	41	9.5	7.6	4.3
Switzerland	1,235	8.2	3.8	3.4	3	1	0.57	0.56	0.49	1,843	888	814	774	228	131	131	126
FYROM	960.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	9,548	-	-	24	18	-	-	0.2	0.3	-	-	229	97	-	-	2.3	1.4
United Kingdom	3,059	10	3.6	3	3.2	0.6	0.2	0.2	0.2	242	177.2	111.2	154.4	13.9	11.3	7.1	7.8

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table51: Ind 6.7 Consumption of forest products

Country	Forest [1,000 ha]	Consumption of forest products					
		m3 RWE per 1,000 inhabitants				Annual rate of change [%]	
	2010	1990**	2000**	2005**	2010**	1990-2010	2000-2010
Albania	776	274	134	211	362	1.56	10.45
Andorra	16	-	-	-	-	-	-
Austria	3,860	2,296	2,815	2,951	3,014	1.52	0.69
Belarus	8,630	1,038	658	853	1,245	1.01	6.59
Belgium	681.2	1,718	1,643	1,669	1,656	-0.2	0.08
Bosnia and Herzegovina	2,102.7	352	441	657	532	2.32	1.89
Bulgaria	3,737	387	396	673	823	4.28	7.58
Croatia	1,920	229	861	1,062	1,024	8.67	1.74
Cyprus	172.8	751	541	742	508	-2.15	-0.64
Czech Republic	2,657.4	882	989	1,369	1,306	2.2	2.82
Denmark	587.1	2,005	2,672	2,568	1,957	-0.13	-3.07
Estonia	2,233.9	635	2,495	3,885	3,626	10.16	3.81
Finland	22,218	3,189	4,211	4,383	3,628	0.72	-1.48
France	16,424	1,683	1,657	1,564	1,381	-1.09	-1.8
Georgia	2,822.4	72	108	135	227	6.61	7.73
Germany	11,409	1,418	1,527	1,719	1,658	0.87	0.82
Greece	3,903	648	761	845	646	-0.02	-1.62
Holy See	0	-	-	-	-	-	-
Hungary	2,046.4	595	832	975	817	1.78	-0.18
Iceland	42.7	709	967	1,181	949	1.63	-0.19
Ireland	725.6	859	1,223	1,229	709	-1.06	-5.31
Italy	9,028	973	1,277	1,337	1,147	0.92	-1.07
Latvia	3,354	956	1,894	2,417	2,193	4.72	1.48
Liechtenstein	6.2	1,206	1,048	998	766	-2.49	-3.08
Lithuania	2,170	116	944	1,458	1,836	16.61	6.88
Luxembourg	86.8	1,849	1,467	1,985	2,454	1.59	5.28
Malta	0.3	397	502	521	428	0.42	-1.59
Moldova	386	24	135	216	329	15.74	9.33
Monaco	0	-	-	-	-	-	-
Montenegro	826.8	420	422	419	874	4.16	7.55
Netherlands	373.5	1,347	1,440	1,299	1,204	-0.62	-1.77
Norway	12,102	1,881	1,998	2,364	2,257	1.02	1.22
Poland	9,329	413	637	924	1,137	5.78	5.96
Portugal	3,239.1	628	850	776	818	1.48	-0.39
Romania	6,515	508	424	565	680	1.64	4.84
Russian Federation *	809,090	1,132	683	906	957	-0.93	3.43
Serbia	2,713	722	728	757	1,214	2.93	5.24
Slovakia	1,938.9	626	877	1,187	1,350	4.37	4.41
Slovenia	1,247	1,232	1,553	1,810	1,965	2.63	2.38
Spain	18,247.2	844	1,154	1,222	830	-0.09	-3.24
Sweden	28,073	2,439	2,945	3,163	2,816	0.8	-0.45
Switzerland	1,235	1,563	1,554	1,489	1,432	-0.49	-0.82
FYROM	960.4	191	507	595	592	6.49	1.56
Turkey	11,202.8	492	474	574	635	1.42	2.96
Ukraine	9,548	258	226	387	404	2.53	6
United Kingdom	3,059	1,075	1,210	1,256	1,004	-0.38	-1.84

** Data of following years were used for the following reference years:

1990 - 1992
2000 - average of 1998-2002
2005 - average of 2003-2007
2010 - average of 2008-2012

Sources:

Note: Includes consumption of woodfuel, sawnwood, wood-based panels and paper and board and removals of other industrial roundwood. Sawnwood converted at 1.84 roundwood equivalent / m^3 of finished product, wood-based panesl at 1.6 and paper and board at 3.6 RWE per metric tonne.

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 52: Ind 6.8A Exports of forest products (volume)

Country	Forest [1,000 ha]	Exports of forest products							
		1990**	2000**	2005**	2010**	Annual rate of change			
						1990-2010		2000-2010	
	2010	Million m3 RWE				Million m3	%	Million m3	%
Albania	776	0	0.13	0.1	0.09	0.01	27.48	0	-4.28
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	19.49	28.39	34.51	32.46	0.72	2.87	0.41	1.35
Belarus	8,630	0.25	2.89	4.62	4.11	0.21	16.75	0.12	3.61
Belgium	681.2	17.56	18.08	22.36	21.82	0.24	1.21	0.37	1.9
Bosnia and Herzegovina	2,102.7	0.29	0.41	2.09	2.4	0.12	12.41	0.2	19.26
Bulgaria	3,737	0.62	1.31	2.57	2.7	0.12	8.49	0.14	7.45
Croatia	1,920	1.3	2.05	2.39	2.78	0.08	4.32	0.07	3.09
Cyprus	172.8	0.01	0.01	0	0	0	-13.09	0	-23.08
Czech Republic	2,657.4	4.31	9.37	11.88	12.43	0.45	6.07	0.31	2.87
Denmark	587.1	1.87	1.99	2.32	2.88	0.06	2.42	0.09	3.73
Estonia	2,233.9	0.65	6.62	5	4.81	0.23	11.78	-0.18	-3.15
Finland	22,218	41.85	65.25	71.06	59.47	0.98	1.97	-0.58	-0.92
France	16,424	20.82	28.91	33.79	30.39	0.53	2.12	0.15	0.5
Georgia	2,822.4	0.07	0.08	0.24	0.1	0	2.01	0	2.21
Germany	11,409	28.81	51.33	78.26	82.06	2.96	5.99	3.07	4.8
Greece	3,903	0.3	0.47	0.58	0.71	0.02	4.8	0.02	4.21
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	2.12	3.39	3.88	3.93	0.1	3.47	0.05	1.48
Iceland	42.7	0.04	0.01	0	0.01	0	-6.2	0	7.05
Ireland	725.6	1.3	1.61	2.51	2.41	0.06	3.48	0.08	4.11
Italy	9,028	5.3	9.94	13.03	13.68	0.47	5.41	0.37	3.24
Latvia	3,354	0.6	9.87	10.06	9.51	0.49	16.58	-0.04	-0.38
Liechtenstein	6.2	0	-	0.01	0.01	0	-	-	-
Lithuania	2,170	0.41	3.02	3.53	3.27	0.16	12.16	0.03	0.8
Luxembourg	86.8	0.71	0.72	1.14	1.08	0.02	2.36	0.04	4.09
Malta	0.3	0.02	-	0	0	0	-10.34	-	-
Moldova	386	0.01	0.03	0.03	0.04	0	9.24	0	3.37
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	0.19	0.19	0.19	0.2	0	0.41	0	0.74
Netherlands	373.5	9.74	12.52	14.76	12.56	0.16	1.43	0	0.03
Norway	12,102	9.67	11.54	11.03	8.82	-0.05	-0.51	-0.27	-2.66
Poland	9,329	4.23	7.24	10.79	12.49	0.46	6.2	0.52	5.6
Portugal	3,239.1	8.95	9.1	11.27	11.82	0.16	1.56	0.27	2.66
Romania	6,515	0.93	4.78	6.71	8.33	0.41	12.94	0.35	5.71
Russian Federation *	809,090	25.8	59.5	92.06	79.19	2.97	6.43	1.97	2.9
Serbia	2,713	0.57	0.57	0.62	0.82	0.01	2.03	0.02	3.67
Slovakia	1,938.9	0.99	5.21	6.52	7.6	0.37	12.01	0.24	3.85
Slovenia	1,247	2.09	2.88	3.91	5.51	0.19	5.53	0.26	6.7
Spain	18,247.2	5.28	10.87	14.71	19.14	0.77	7.42	0.83	5.82
Sweden	28,073	50.83	65.26	74.79	72.86	1.22	2.02	0.76	1.11
Switzerland	1,235	5.7	8.38	8.44	5.74	0	0.04	-0.26	-3.71
FYROM	960.4	0.12	0.06	0.07	0.07	0	-3.3	0	0.82
Turkey	11,202.8	0.27	0.75	1.69	2.57	0.13	13.37	0.18	13.04
Ukraine	9,548	0.05	2.53	6.72	8	0.44	33.03	0.55	12.18
United Kingdom	3,059	5.14	7.36	6.96	5.59	0.03	0.47	-0.18	-2.71

** Data of following years were used for the following reference years:
1990 - 1992
2000 - average of 1998-2002
2005 - average of 2003-2007
2010 - average of 2008-2012

Sources:

Note: Includes consumption of woodfuel, sawnwood, wood-based panels and paper and board and removals of other industrial roundwood. Sawnwood converted at 1.84 roundwood equivalent / m3 of finished product, wood-based panesl at 1.6 and paper and board at 3.6 RWE per metric tonne.

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 53: Ind 6.8B Imports of forest products (volume)

Country	Forest [1,000 ha]	Imports of forest products							
		1990**	2000**	2005**	2010**	Annual rate of change			
						1990-2010		2000-2010	
	2010	Million m3 RWE				Million m3	%	Million m3	%
Albania	776	0.01	0.12	0.27	0.37	0.02	19.61	0.02	11.78
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	10.85	17.36	20.07	20.11	0.51	3.49	0.27	1.48
Belarus	8,630	0.01	1.13	1.26	1.71	0.09	37.37	0.06	4.25
Belgium	681.2	23.89	24.92	28.06	27.9	0.22	0.87	0.3	1.14
Bosnia and Herzegovina	2,102.7	0.04	0.06	0.53	0.9	0.05	18.79	0.08	30.33
Bulgaria	3,737	0.22	0.66	1.51	1.88	0.09	12.59	0.12	10.95
Croatia	1,920	0.3	1.57	2.06	1.78	0.08	10.42	0.02	1.23
Cyprus	172.8	0.54	0.49	0.76	0.55	0	0.06	0.01	1.06
Czech Republic	2,657.4	1.67	4.78	7.53	8.61	0.39	9.54	0.38	6.05
Denmark	587.1	8.57	13.18	12.77	9.1	0.03	0.33	-0.41	-3.63
Estonia	2,233.9	0.01	1.33	3.37	2.34	0.13	40.39	0.1	5.78
Finland	22,218	7.65	13.42	18.17	12.12	0.25	2.59	-0.13	-1.02
France	16,424	31.19	40.32	43.75	39.1	0.44	1.26	-0.12	-0.31
Georgia	2,822.4	0.01	0.01	0.11	0.34	0.02	19.26	0.03	37.35
Germany	11,409	59.01	68.39	77.59	80.65	1.2	1.75	1.23	1.66
Greece	3,903	3.4	4.98	6	4.41	0.06	1.45	-0.06	-1.21
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	3.05	4.97	6.24	5.01	0.11	2.8	0	0.08
Iceland	42.7	0.23	0.28	0.37	0.24	0	0.4	0	-1.36
Ireland	725.6	2.48	3.5	3.97	2.63	0.01	0.32	-0.09	-2.82
Italy	9,028	39.37	50.1	54.19	49.07	0.54	1.23	-0.1	-0.21
Latvia	3,354	0.01	0.74	2.78	1.61	0.09	30.2	0.09	8.11
Liechtenstein	6.2	0	-	-	-	-	-	-	-
Lithuania	2,170	0	1.06	2.35	2.43	0.13	43.2	0.14	8.58
Luxembourg	86.8	1.02	1.23	1.67	1.8	0.04	3.22	0.06	3.87
Malta	0.3	0.16	0.2	0.21	0.19	0	0.81	0	-0.49
Moldova	386	0.12	0.36	0.4	0.55	0.02	8.83	0.02	4.49
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	0.05	0.05	0.05	0.1	0	4.14	0.01	7.58
Netherlands	373.5	21.19	25.89	25.93	23.65	0.14	0.61	-0.22	-0.9
Norway	12,102	3.65	7.28	7.18	5.54	0.1	2.34	-0.17	-2.69
Poland	9,329	0.76	7.88	14.8	19.85	1.06	19.89	1.2	9.68
Portugal	3,239.1	2.6	4.91	4.66	5.5	0.16	4.24	0.06	1.14
Romania	6,515	0.36	1.04	2.65	3.67	0.18	13.78	0.26	13.45
Russian Federation *	809,090	0.37	2.81	6.85	7.03	0.37	17.81	0.42	9.6
Serbia	2,713	2.55	2.55	2.7	2.71	0.01	0.33	0.02	0.6
Slovakia	1,938.9	0.14	2.63	2.9	4.28	0.23	20.71	0.16	4.97
Slovenia	1,247	1.27	2.23	3.18	4.29	0.17	6.98	0.21	6.78
Spain	18,247.2	15.96	27.58	31.48	23.36	0.41	2.14	-0.42	-1.65
Sweden	28,073	7.51	15.3	15.5	14.16	0.37	3.58	-0.11	-0.78
Switzerland	1,235	6.65	7.58	7.87	6.66	0	0.01	-0.09	-1.28
FYROM	960.4	0.14	0.42	0.54	0.67	0.03	9.22	0.02	4.75
Turkey	11,202.8	2.2	6.54	12.27	15.92	0.76	11.62	0.94	9.3
Ukraine	9,548	0.02	2	3.97	4.24	0.23	34.44	0.22	7.8
United Kingdom	3,059	48.41	51.31	55.35	43.83	-0.25	-0.55	-0.75	-1.56

** Data of following years were used for the following reference years:

1990 - 1992
2000 - average of 1998-2002
2005 - average of 2003-2007
2010 - average of 2008-2012

Sources:

Note: Includes consumption of woodfuel, sawnwood, wood-based panels and paper and board and removals of other industrial roundwood. Sawnwood converted at 1.84 roundwood equivalent / m^3 of finished product, wood-based panesl at 1.6 and paper and board at 3.6 RWE per metric tonne.

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 54: Ind 6.8C Exports of forest products (value)

Country	Forest [1,000 ha]	Exports of forest products							
		1990**	2000**	2005**	2010**	Annual rate of change			
						1990-2010		2000-2010	
	2010	Million Euro				Million Euro	%	Million Euro	%
Albania	776	0.7	11.77	4.42	4.88	0.23	11.41	-0.69	-8.43
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	2,653.42	4,241.79	5,083.71	5,114.29	136.72	3.71	87.25	1.89
Belarus	8,630	16.91	156.94	207.23	265.87	13.83	16.54	10.89	5.41
Belgium	681.2	2,503.07	3,316.65	3,886	3,813.35	72.79	2.37	49.67	1.41
Bosnia and Herzegovina	2,102.7	16.94	0.16	147.26	220	11.28	15.31	21.98	105.45
Bulgaria	3,737	47.92	111.83	194.22	258.08	11.68	9.81	14.63	8.72
Croatia	1,920	146.19	234.87	288.97	354.03	11.55	5.04	11.92	4.19
Cyprus	172.8	1.68	0.49	0.39	0.35	-0.07	-8.28	-0.01	-3.18
Czech Republic	2,657.4	323.37	887.22	1,284.85	1,547.31	68	9.09	66.01	5.72
Denmark	587.1	310.07	355.51	348.36	333.35	1.29	0.4	-2.22	-0.64
Estonia	2,233.9	15.99	375.66	436.66	514.22	27.68	21.27	13.86	3.19
Finland	22,218	6,475.27	10,878.6	10,818.07	9,696.23	178.94	2.27	-118.24	-1.14
France	16,424	3,153.54	5,468.82	5,681.06	5,193.55	113.33	2.81	-27.53	-0.52
Georgia	2,822.4	2.56	3.86	11.71	15.69	0.73	10.59	1.18	15.06
Germany	11,409	4,806.92	10,470.73	13,751.9	14,802.23	555.29	6.45	433.15	3.52
Greece	3,903	64.66	73.17	95.79	96.52	1.77	2.25	2.34	2.81
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	117.57	370.78	554.82	657.78	30.01	10.04	28.7	5.9
Iceland	42.7	8.75	0.35	0.17	0.11	-0.48	-21.59	-0.02	-11.08
Ireland	725.6	123.38	266.83	382.44	317.73	10.8	5.4	5.09	1.76
Italy	9,028	1,410.83	2,514.71	3,127.65	3,323.22	106.24	4.87	80.85	2.83
Latvia	3,354	21.31	598.78	788.65	828.48	44.84	22.55	22.97	3.3
Liechtenstein	6.2	0	-	-	0.48	0.03	-	-	-
Lithuania	2,170	14.02	199.92	286.89	315.37	16.74	18.88	11.54	4.66
Luxembourg	86.8	102.38	174.62	190.95	199.12	5.37	3.76	2.45	1.32
Malta	0.3	2.38	0.03	0.45	1.05	-0.07	-4.43	0.1	41.76
Moldova	386	0.54	0.57	3.5	8.6	0.45	16.64	0.8	31.29
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	8.84	11.68	9.23	14.98	0.34	2.97	0.33	2.52
Netherlands	373.5	1,629.2	2,565.19	2,732.57	2,646.53	56.52	2.73	8.13	0.31
Norway	12,102	1,108.14	1,689.28	1,477.67	1,226.24	6.56	0.56	-46.3	-3.15
Poland	9,329	389.37	1,010.45	1,713.45	2,116.9	95.97	9.86	110.65	7.68
Portugal	3,239.1	818.96	1,262.88	1,532.29	1,765.23	52.57	4.36	50.23	3.41
Romania	6,515	107.09	473.3	723.79	995.45	49.35	13.19	52.21	7.72
Russian Federation *	809,090	1,137.61	3,696.84	6,110.26	6,212.98	281.97	9.89	251.61	5.33
Serbia	2,713	124.3	164.17	139.63	166.19	2.33	1.63	0.2	0.12
Slovakia	1,938.9	74.93	488.54	854.11	1,118.55	57.98	16.2	63	8.64
Slovenia	1,247	238.88	420.29	566.78	737.53	27.7	6.46	31.72	5.78
Spain	18,247.2	833.08	1,993.24	2,635.62	3,183.55	130.58	7.73	119.03	4.79
Sweden	28,073	7,077.87	9,654.12	10,823.59	11,455.51	243.2	2.71	180.14	1.73
Switzerland	1,235	1,078.81	1,566.97	1,495.28	1,090.34	0.64	0.06	-47.66	-3.56
FYROM	960.4	15.36	8.13	7.33	6.8	-0.48	-4.43	-0.13	-1.77
Turkey	11,202.8	39.24	121.36	233.6	476.4	24.29	14.88	35.5	14.65
Ukraine	9,548	4.74	252.13	566.48	718.7	39.66	32.18	46.66	11.04
United Kingdom	3,059	1,303.79	2,034.38	1,723.03	1,484.95	10.06	0.73	-54.94	-3.1

** Data of following years were used for the following reference years:
1990 - 1992
2000 - average of 1998-2002
2005 - average of 2003-2007
2010 - average of 2008-2012

Sources:

Note: Includes consumption of woodfuel, sawnwood, wood-based panels and paper and board and removals of other industrial roundwood. Sawnwood converted at 1.84 roundwood equivalent / m3 of finished product, wood-based panesl at 1.6 and paper and board at 3.6 RWE per metric tonne.

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 55: Ind 6.8D Imports of forest products (value)

Country	Forest [1,000 ha]	Imports of forest products							
		1990**	2000**	2005**	2010**	Annual rate of change			
						1990-2010		2000-2010	
	2010	Million Euro				Million Euro	%	Million Euro	%
Albania	776	2.04	10.36	12.73	39.3	2.07	17.85	2.89	14.26
Andorra	16	-	-	-	-	-	-	-	-
Austria	3,860	1,283.29	2,248.1	2,465.19	2,671.24	77.11	4.16	42.31	1.74
Belarus	8,630	0.91	146.02	163.59	326.83	18.11	38.68	18.08	8.39
Belgium	681.2	3,006.55	4,017.35	4,275.45	4,224.05	67.64	1.91	20.67	0.5
Bosnia and Herzegovina	2,102.7	1.96	1.31	97.52	148.56	8.14	27.19	14.72	60.45
Bulgaria	3,737	21.94	117.74	230.69	301.83	15.55	15.68	18.41	9.87
Croatia	1,920	37.41	268.1	296.82	305.15	14.87	12.37	3.71	1.3
Cyprus	172.8	81.22	76.41	127.16	110.58	1.63	1.73	3.42	3.76
Czech Republic	2,657.4	191.89	736.79	1,087.49	1,337.87	63.67	11.39	60.11	6.15
Denmark	587.1	1,348.25	1,721.98	1,809.66	1,350.89	0.15	0.01	-37.11	-2.4
Estonia	2,233.9	1.03	120.77	306.15	309.58	17.14	37.33	18.88	9.87
Finland	22,218	486.25	913.18	1,297.13	1,195.54	39.4	5.12	28.24	2.73
France	16,424	5,033.35	7,327.71	7,393.97	7,051.14	112.1	1.89	-27.66	-0.38
Georgia	2,822.4	1.07	1.43	15.91	53.3	2.9	24.28	5.19	43.62
Germany	11,409	9,197.17	11,496.02	12,474.28	13,333.29	229.78	2.08	183.73	1.49
Greece	3,903	472.17	781.31	907.33	728.63	14.25	2.44	-5.27	-0.7
Holy See	0	-	-	-	-	-	-	-	-
Hungary	2,046.4	164.88	667.65	923.9	905.07	41.12	9.92	23.74	3.09
Iceland	42.7	31.19	53.59	67.8	30.23	-0.05	-0.17	-2.34	-5.57
Ireland	725.6	450.76	721.73	821.83	585.51	7.49	1.46	-13.62	-2.07
Italy	9,028	5,095.75	7,180.26	7,696.14	7,162.86	114.84	1.91	-1.74	-0.02
Latvia	3,354	1.37	95.92	273.28	206.89	11.42	32.14	11.1	7.99
Liechtenstein	6.2	0	-	-	-	-	-	-	-
Lithuania	2,170	0.4	129.78	308.68	382.53	21.23	46.44	25.28	11.42
Luxembourg	86.8	124.2	166.43	220.83	251.55	7.07	4	8.51	4.22
Malta	0.3	31.62	37.8	64.97	66.73	1.95	4.24	2.89	5.85
Moldova	386	8.17	16.27	32.47	72.78	3.59	12.92	5.65	16.16
Monaco	0	-	-	-	-	-	-	-	-
Montenegro	826.8	9.08	11.99	9.47	16.28	0.4	3.3	0.43	3.11
Netherlands	373.5	3,430.14	4,476.36	4,459.16	4,351.3	51.18	1.33	-12.51	-0.28
Norway	12,102	525.73	957.01	988.76	925.44	22.21	3.19	-3.16	-0.33
Poland	9,329	106.67	1,397.33	2,289.88	3,085.88	165.51	20.56	168.85	8.25
Portugal	3,239.1	489.25	943.01	953.77	943.02	25.21	3.71	0	0
Romania	6,515	50.66	215.73	483.26	611.99	31.18	14.85	39.63	10.99
Russian Federation *	809,090	55.36	493.08	1,177.85	1,671.32	89.78	20.84	117.82	12.98
Serbia	2,713	414.31	547.18	462.92	441.18	1.49	0.35	-10.6	-2.13
Slovakia	1,938.9	24.97	311.33	515.83	745.3	40.02	20.76	43.4	9.12
Slovenia	1,247	198.97	340.5	456.34	548.98	19.44	5.8	20.85	4.89
Spain	18,247.2	2,228.8	4,209.56	4,581.27	3,608.45	76.65	2.71	-60.11	-1.53
Sweden	28,073	787.55	1,461.32	1,721.96	1,725.05	52.08	4.45	26.37	1.67
Switzerland	1,235	1,512.58	1,703.38	1,686.19	1,507.16	-0.3	-0.02	-19.62	-1.22
FYROM	960.4	16.87	56.66	58.03	82.51	3.65	9.22	2.59	3.83
Turkey	11,202.8	347.1	1,017.77	1,742.59	2,602.1	125.28	11.84	158.43	9.84
Ukraine	9,548	1.42	305.87	604.83	799.69	44.35	42.2	49.38	10.09
United Kingdom	3,059	7,008.13	9,063.73	9,020.79	7,416.89	22.71	0.32	-164.68	-1.99

** Data of following years were used for the following reference years:

1990 - 1992
2000 - average of 1998-2002
2005 - average of 2003-2007
2010 - average of 2008-2012

Sources:

Note: Includes consumption of woodfuel, sawnwood, wood-based panels and paper and board and removals of other industrial roundwood. Sawnwood converted at 1.84 roundwood equivalent / m^3 of finished product, wood-based panesl at 1.6 and paper and board at 3.6 RWE per metric tonne.

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 56: Ind 6.9 Total energy production from wood, 2009-2011

Country	Forest (1,000 ha)	2009									
		Total energy supply from wood	Energy from direct wood fibre sources			Energy from co-products and residues of the wood processing industries		Energy from processed wood-based fuels		Energy from post consumer recovered wood	Energy from unknown/ unspecified sources
			Total	Forests & other wooded land	Other land	Total	Solid residues	Total	Imported		
	2010	Thousand metric tonnes dry matter									
Albania	776	0	-	-	-	-	-	-	0	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,860	9,297.8	3,333.5	2,842.2	305.4	5,589.6	3,931.8	374.7	700.2	-	0
Belarus	8,630	-	-	-	-	-	-	-	0.3	-	-
Belgium	681.2	1,188.1	-	-	-	636.7	265.5	291.7	89	-	259.8
Bosnia and Herzegovina	2,102.7	0	-	-	-	-	-	-	0.6	-	-
Bulgaria	3,737	0	-	-	-	-	-	-	0.1	-	-
Croatia	1,920	-	-	-	-	1,700	-	83	-	-	-
Cyprus	172.8	12.9	2	1.1	0.9	0.7	0.7	10.1	9.8	0	0
Czech Republic	2,657.4	3,838	2,261	867	694	1,501	660	76	41	-	-
Denmark	587.1	5,301.6	2,648.4	1,479.3	1,169.1	478.9	478.9	1,621.5	1,426.9	552.9	0
Estonia	2,233.9	1,823.2	723.7	723.7	0	1,056.8	1,022.8	35	47.4	7.7	0
Finland	22,218	15,409.9	4,238.4	4,238.4	-	10,913.8	2,985	70.8	52.4	186.9	-
France	16,424	21,141.9	12,267	7,448.7	3,859.9	7,499.8	5,085.2	364.9	61.8	1,010.3	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,409	21,445.7	10,696.9	9,145.5	1,551.4	6,193.7	6,193.7	1,683	149.3	4,182.5	372.6
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	2,196,789.9	1,806,598.4	-	-	195,089.5	195,089.5	12.5	-	-	-
Iceland	42.7	0	-	-	-	-	-	-	0.3	-	-
Ireland	725.6	307.9	61	61	0	146	146	46.9	23.7	54	0
Italy	9,028	5,040	3,422	-	-	1,100	1,100	-	547	518	-
Latvia	3,354	0	-	-	-	-	-	-	1.1	-	-
Liechtenstein	6.2	13.5	6.3	6.3	-	7.2	7.2	-	0	-	-
Lithuania	2,170	2,097	1,105	980	126	751	616	86	-	154	0
Luxembourg	86.8	161.6	109.1	-	-	51.6	51.6	1	1	-	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	96	91.6	77.7	-	13.9	13.9	2.1	-	2.3	-
Netherlands	373.5	-	-	-	-	-	-	-	-	-	-
Norway	12,102	2,097	1,127	1,127	-	733	435	86	46	-	151
Poland	9,329	0	-	-	-	-	-	-	59.4	-	-
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-
Romania	6,515	0	-	-	-	-	-	-	4	-	-
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	3,139.8	2,903	2,878	25	168	168	54.8	6	14	-
Slovakia	1,938.9	1,109	249	238	10	709	331	104	7	40	0
Slovenia	1,247	954	701.5	550.3	151.2	247	247	5.6	39.3	-	-
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	24,316.2	6,583	0	0	14,767	3,410	2,484.2	452.4	482	-
Switzerland	1,235	2,216.8	1,303.4	1,115	188.4	415.1	415.1	141.3	45.8	355.9	0
FYROM	960.4	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	0	-	-	-	-	-	-	19	-	-
Ukraine	9,548	6,186	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	2,094	839	493	346	515	496	195	85	544	0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators

* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 56: Ind 6.9 Total energy production from wood, 2009-2011 (cont.)

Country	Forest (1,000 ha)	2011									
		Total energy supply from wood	Energy from direct wood fibre sources			Energy from co-products and residues of the wood processing industries		Energy from processed wood-based fuels		Energy from post consumer recovered wood	Energy from unknown/ unspecified sources
			Total	Forests & other wooded land	Other land	Total	Solid residues	Total	Imported		
	2010	Thousand metric tonnes dry matter									
Albania	776	4,837	4,837	4,450	-	-	-	-	0	-	-
Andorra	16	-	-	-	-	-	-	-	-	-	-
Austria	3,860	106,655	32,742	27,093	2,913	68,861	48,271	5,052	12,545	-	0
Belarus	8,630	-	-	-	-	-	-	-	6	-	-
Belgium	681.2	0	-	-	-	-	-	-	916	-	-
Bosnia and Herzegovina	2,102.7	5,131	3,734	2,994	400	1,250	480	147	9	-	-
Bulgaria	3,737	19,932	14,502	14,502	-	5,380	3,176	50	4	-	-
Croatia	1,920	-	-	-	-	17,000	-	1,642	-	-	-
Cyprus	172.8	166	43	4	39	13	13	110	110	-	-
Czech Republic	2,657.4	41,480	23,490	9,190	7,300	16,670	7,870	1,320	728	-	-
Denmark	587.1	63,683	26,403	16,971	9,432	6,353	6,353	24,274	22,332	6,652	0
Estonia	2,233.9	19,955	10,750	10,438	313	8,327	7,127	524	212	354	-
Finland	22,218	188,276	53,806	53,806	0	131,784	34,514	660	169	2,025	-
France	16,424	196,279	142,734	73,166	26,131	40,111	22,692	6,057	1,048	7,377	-
Georgia	2,822.4	-	-	-	-	-	-	-	-	-	-
Germany	11,409	282,768	142,406	120,615	21,791	56,605	47,056	19,098	4,455	57,711	6,949
Greece	3,903	-	-	-	-	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-	-	-	-	-
Hungary	2,046.4	24,854,297	20,056,715	-	-	2,398,566	2,398,566	450	204	-	-
Iceland	42.7	29	8	8	-	15	15	3	3	2	2
Ireland	725.6	3,033	991	951	40	1,472	1,472	570	316	0	0
Italy	9,028	50,405	34,222	-	-	11,000	11,000	-	676	5,183	-
Latvia	3,354	0	-	-	-	-	-	-	22	-	-
Liechtenstein	6.2	0	-	-	-	-	-	-	0	-	-
Lithuania	2,170	20,590	8,460	7,540	910	6,250	3,620	4,570	-	1,310	0
Luxembourg	86.8	1,427	873	-	-	542	542	12	37	0	-
Malta	0.3	-	-	-	-	-	-	-	-	-	-
Moldova	386	-	-	-	-	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-	-	-	-	-
Montenegro	826.8	997	947	775	-	172	172	28	-	23	-
Netherlands	373.5	22,558	4,115	1,340	2,775	1,910	1,910	11,240	10,570	3,600	0
Norway	12,102	26,916	10,030	10,030	-	13,396	5,540	910	747	320	2,260
Poland	9,329	41,686	-	-	-	-	-	-	740	-	41,686
Portugal	3,239.1	-	-	-	-	-	-	-	-	-	-
Romania	6,515	75,010	16,520	-	-	-	-	-	38	-	58,490
Russian Federation *	809,090	-	-	-	-	-	-	-	-	-	-
Serbia	2,713	29,320	25,300	22,130	3,170	3,240	3,240	630	30	150	-
Slovakia	1,938.9	22,962	9,515	8,666	849	13,094	7,324	270	21	353	0
Slovenia	1,247	11,765	9,126	7,614	1,512	2,315	2,315	60	510	84	180
Spain	18,247.2	-	-	-	-	-	-	-	-	-	-
Sweden	28,073	243,340	68,980	-	420	147,550	34,130	22,380	6,875	4,430	-
Switzerland	1,235	21,827	12,586	10,701	1,885	3,776	3,776	1,558	549	3,874	-
FYROM	960.4	-	-	-	-	-	-	-	-	-	-
Turkey	11,202.8	89,368	88,780	88,780	-	288	288	300	320	-	-
Ukraine	9,548	59,530	-	-	-	-	-	-	-	-	-
United Kingdom	3,059	43,160	17,120	13,530	3,590	11,590	10,660	13,320	10,770	1,130	0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 57: Ind 6.10 Accessibility for recreation and intensity of use

Country	Forest [1,000 ha]	Total forest and other wooded land					
		Area with access available to the public for recreational purposes (2010)		Area primarily designated or managed for public recreation (2010)		Intensity of use	
	2010	Total (1,000 ha)	% of total	Total (1,000 ha)	% of total	Year (latest available)	Annual number of visits (million)
Albania	776	-	-	-	-	-	-
Andorra	16	0.30	100.0	-	-	-	-
Austria	3,860	3,759.00	94.0	44.0	1.1	-	-
Belarus	8,630	9,031.10	98.5	1,534.4	16.7	-	-
Belgium	681.2	697.60	97.7	-	-	-	-
Bosnia and Herzegovina	2,102.7	2,778.30	100.0	-	-	-	-
Bulgaria	3,737	3,532.00	93.9	791.0	21.0	-	-
Croatia	1,920	2,347.00	99.0	16.3	0.7	2005	2.0
Cyprus	172.8	157.74	40.9	15.7	4.1	2005	0.6
Czech Republic	2,657.4	2,657.38	100.0	28.2	1.1	2012	252.2
Denmark	587.1	586.71	99.9	2.4	0.4	2008	70.0
Estonia	2,233.9	2,250.63	91.8	15.2	0.6	2013	1.7
Finland	22,218	22,156.90	99.7	-	-	-	-
France	16,424	4,049.00	25.0	-	-	2010	620.0
Georgia	2,822.4	-	-	-	-	-	-
Germany	11,409	10,838.55	95.0	228.2	2.0	2012	1,500.0
Greece	3,903	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-
Hungary	2,046.4	1,995.33	97.5	38.8	1.9	2012	22.0
Iceland	42.7	179.34	1.0	32.1	0.2	-	-
Ireland	725.6	409.92	0.6	19.3	0.05	2005	18.0
Italy	9,028	-	-	-	-	2000	168.0
Latvia	3,354	3,129.00	93.0	1,638.0	49.0	-	-
Liechtenstein	6.2	7.40	100.0	0.6	8.0	-	-
Lithuania	2,170	2,144.00	99.0	65.0	3.0	-	-
Luxembourg	86.8	87.60	99.3	-	-	-	-
Malta	0.3	0.35	100.0	-	-	-	-
Moldova	386	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-
Montenegro	826.8	964.26	100.0	-	-	-	-
Netherlands	373.5	309.60	83.0	37.3	10.0	-	-
Norway	12,102	14,043.00	100.0	-	-	2004	140.0
Poland	9,329	7,819.00	84.0	727.0	9.0	-	-
Portugal	3,239.1	-	-	34.0	6.5	2012	0.2
Romania	6,515	-	-	370.0	5.5	-	-
Russian Federation *	809,090	867,081.60	98.2	16,021.9	1.8	2005	1.4
Serbia	2,713	3,123.00	100.0	2.0	0.1	-	-
Slovakia	1,938.9	1,829.20	94.3	25.6	1.3	-	-
Slovenia	1,247	1,237.40	99.2	27.9	2.2	-	-
Spain	18,247.2	-	-	-	-	-	-
Sweden	28,073	30,505.00	100.0	52.0	0.2	2007	200.0
Switzerland	1,235	1,234.00	100.0	127.0	10.0	2012	420.0
FYROM	960.4	-	-	-	-	-	-
Turkey	11,202.8	-	-	-	-	-	-
Ukraine	9,548	734.00	50.0	724.0	50.0	2010	11.0
United Kingdom	3,059	1,389.00	45.0	-	-	2011	500.0

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

Table 58: Ind 6.11 Sites with recognized cultural & spiritual values in forest and other wooded land

Country	Forest [1,000 ha]	Sites [number]					
		Year (Latest available)	Cultural heritage		Forested landscapes	Trees	Other sites
	2015		Total	Of which: associated with historic forest management			
Albania	785	2005	1.00	-	455	348	-
Andorra	16	-	-	-	-	-	-
Austria	3,869	-	-	-	-	-	-
Belarus	8,633.5	2013	-	-	96	108	8
Belgium	683.4	2010	-	-	-	519	-
Bosnia and Herzegovina	2,115	-	-	-	-	-	-
Bulgaria	3,823	-	-	-	-	-	-
Croatia	1,922	2005	-	81	-	71	18
Cyprus	172.7	2011	127.00	20	32	72	-
Czech Republic	2,667.4	-	-	-	-	-	-
Denmark	612.2	2013	18,206.00	-	-	-	-
Estonia	2,232	2010	5,376.00	1,021	-	119	4,236
Finland	22,218	-	-	-	-	-	-
France	16,989	-	-	-	-	-	-
Georgia	2,822.4	-	-	-	-	-	-
Germany	11,419	2005	100,000.00	1,000	500	1,000	97,500
Greece	3,903	-	-	-	-	-	-
Holy See	0	-	-	-	-	-	-
Hungary	2,069.1	2010	5,200.00	200	2,929	4,097	-
Iceland	49.1	2005	28.00	0	1	0	0
Ireland	754	2005	4,482.00	50	-	-	-
Italy	9,297	2011	-	-	45	1,253	-
Latvia	3,356	2013	2,623.00	-	304	2,261	-
Liechtenstein	6.2	-	-	-	-	-	-
Lithuania	2,180	2005	504.00	-	48	145	-
Luxembourg	86.8	-	-	-	-	-	-
Malta	0.3	-	-	-	-	-	-
Moldova	409	-	-	-	-	-	-
Monaco	0	-	-	-	-	-	-
Montenegro	826.8	2010	10.00	-	5	-	-
Netherlands	376	-	-	-	-	-	-
Norway	12,112	-	-	-	-	-	-
Poland	9,435	2012	-	-	328	34,396	-
Portugal	3,182.1	2014	8.00	2	5	553	0
Romania	6,861	-	-	-	-	-	-
Russian Federation *	809,090	2005	145.00	107	107	1,584	0
Serbia	2,720	2005	66.00	-	0	130	-
Slovakia	1,940	2012	26.00	22	-	135	154
Slovenia	1,248	2011	8,321.00	69	46	939	30
Spain	18,417.9	2013	-	-	153	59	-
Sweden	28,073	2013	750,000.00	350,000	400	150,000	-
Switzerland	1,254	-	-	-	-	-	-
FYROM	987.5	-	-	-	-	-	-
Turkey	11,943	-	-	-	7	93	-
Ukraine	9,657	2010	3,650.00	-	-	2,285	-
United Kingdom	3,144	2005	4,452.00	52	104	42,979	95

Sources: FOREST EUROPE/UNECE/FAO enquiry on pan-European quantitative indicators
* The source of the data of Russian Federation is the previous edition of the output tables. 2011.

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