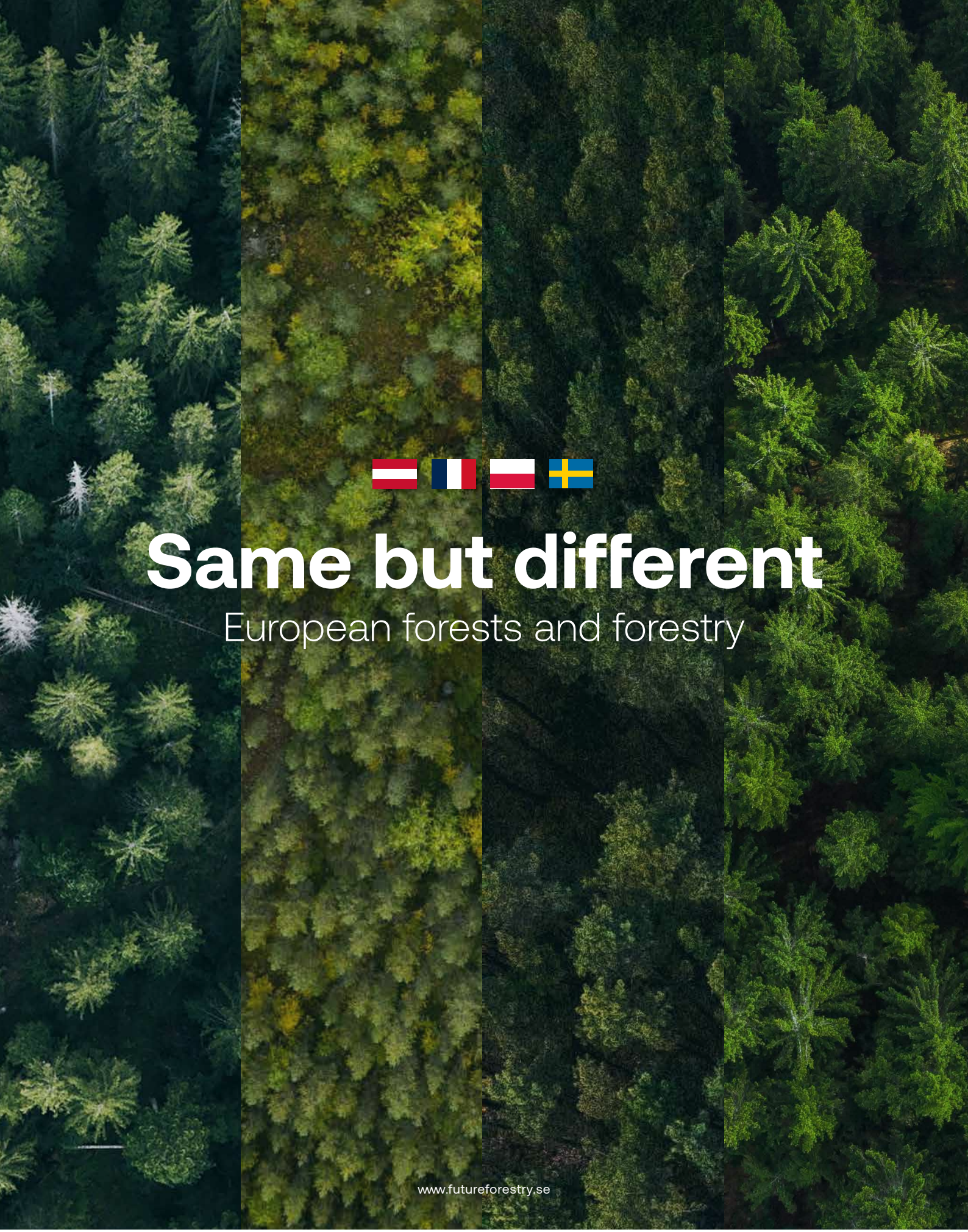


Same but different

European forests and forestry

www.futureforestry.se

Future of FORESTRY

FACHVERBAND HOLZINDUSTRIE ÖSTERREICH

Sit

UCFF
Les Coopératives Forestières

Forests are the green gold of Europe

Forests play a vital role in the green transition of our societies. European forests range from the pine forests of the Canary Islands in the south, to the birch forests north of the polar circle in Sweden and Finland. The climate zones of Europe are wildly diverse, from a 22.3°C average yearly temperature in Malta to –0.3°C in Nuorgam, Finland. Geographically, the EU stretches from a latitude equivalent to the northernmost part of Alaska to Mexico in the south. Applying the same set of policies for a region as diverse as this is challenging, if not impossible.

At the same time we know that **the management of European forests will impact not only us, but also future generations, as well as the state of biodiversity in Europe**. It is therefore welcome news that sustainable forest management has started to attract the attention also of European policy makers. The purpose of this report is to display the heterogeneity of European forests and forestry, and to provide an updated report of the status of European forests.

Photo by Anders Vestergaard Jensen, Unsplash

Contents

Sustainable forest management

Sustainable forest management includes and considers all aspects of sustainability. Forest certification schemes (e.g. FSC and PEFC) have promoted this for decades. Forest management practices are continuously improved as the knowledge-base increases. All aspects of sustainability can be increased in all management types, while taking into consideration the characteristics of the existing management method.

Forest areas in Europe has increased in the last three decades from 145 million to 159 million hectares, thanks to natural processes, afforestation, sustainable management and active restoration.

Forestry innovation needs to continue in order for biodiversity to be better understood and for new wood-based products that can replace fossil-based products to continue to be developed. Sustainable practices and management need to be safeguarded and developed in all territories and rural areas. There is also a need for incentives in order to avoid fragmentation of forest ownership, which leads to unmanaged and unprofitable forests in many regions.

Unmanaged forests create many problems and risks as they absorb less carbon than healthy and growing forests and provide less raw materials to replace fossil-based materials. They also pose great risks in terms of exposure to forest fires and insect attacks. On the contrary, actively managed forests better support rural communities in terms of employment and economic growth.

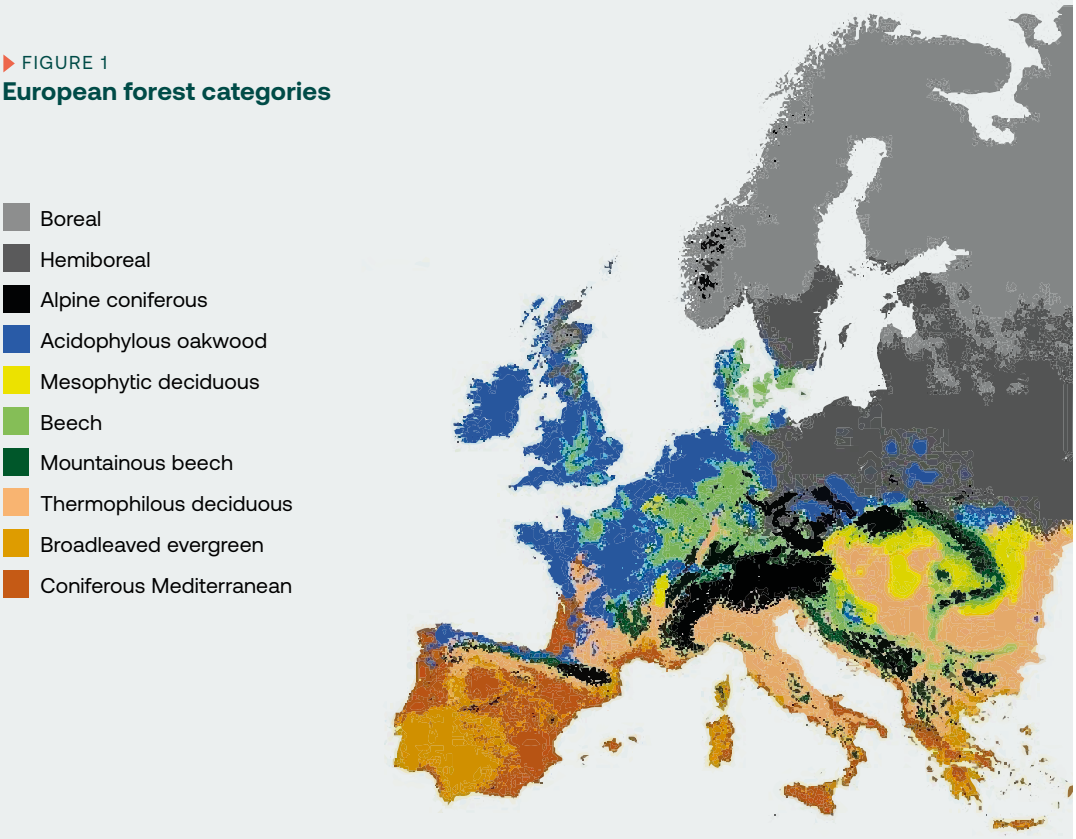
Sara Kulturhus in Skellefteå, Sweden, one of the world's tallest wooden buildings. Photo by Sven Burman

✓ **The forest area is increasing in Europe**
The forest area has increased by 9 per cent since 1990 and today forests cover 35 per cent of Europe's total area. There are large differences between different regions of Europe in terms of tree species. Coniferous trees dominate two thirds of the forests in North Europe, while broadleaved trees represent more than 60 per cent of the forests of South-West Europe.[1] In all countries covered in this report, forests with two or more tree species dominate the forest landscape, ranging from 85 per cent in Sweden to 54 per cent in Austria.[2]

✓ **The growing stock of wood has increased by almost 50 per cent over the last three decades**
European forests play a strategic role in reducing Europe's reliance on imported raw materials and energy. They provide timber, biomass for clean energy, and serve as carbon sinks. Over the last three decades the growing stock of wood has increased from roughly 15 to almost 23 billion m^3 in EU-28[3]. At the same time, the use of wood has increased. As an example the yearly production of roundwood increased from 343 million m^3 in 1990 to 443 million m^3 in 2015[4], showing that it is possible to sustainably provide the bioeconomy with raw material.

✓ **All forests are different – but all forests need to be managed sustainably**
Forests vary significantly, requiring bespoke management approaches. For instance, boosting dead wood is essential for biodiversity in Swedish or Finnish forests but poses a fire risk in Southern EU forests. Overarching European goals are important, while allowing individual countries and forest owners to determine specific management practices. One approach doesn't suit all in forestry.

▸ FIGURE 1
European forest categories



1 State of Europe's Forests 2020, Forest Europe, p. 31.
2 State of Europe's Forests 2020, Forest Europe, p. 296.
3 State of Europe's Forests 2020, Forest Europe, p. 40.
4 State of Europe's Forests 2020, Forest Europe, p. 96.

The forests of Austria, France, Poland and Sweden

Austria

- Austria boasts a diverse range of forests, from broadleaved to coniferous forests
- 81% of Austria's forests are privately owned, mostly by small forest enterprises
- The forests cover around 47% of the country's federal territory
- Single-stem cutting and patch cutting is generally applied, with clear-cutting of areas above 0.5 ha requiring approval

France

- Forest management employs five distinct approaches tailored to the specific forest, depending on location, ecology, and ownership.
- Around 31% of France's total land area is covered by forest
- Southern forests feature a Mediterranean influence with a diverse mix of evergreen and deciduous trees
- Around 75% is privately owned, with 2.2 million forest owners owning at least one hectare of forest land

Poland

- Retention forestry is a common forest management method in Poland, with the clear-cut areas gradually becoming smaller in size
- Around 29% of Poland total land area is covered by forest
- The predominant tree species in most regions is pine
- About 80% of the forests are publicly owned

Sweden

- The primary forest management method in Sweden is retention forestry, with added environmental considerations as standard operating procedure
- Around 62% of Sweden's total land area is covered by forest
- Coniferous trees such as spruce and pine are common throughout the country
- Around 300,000 individual forest owners collectively own 50% of the productive forest land

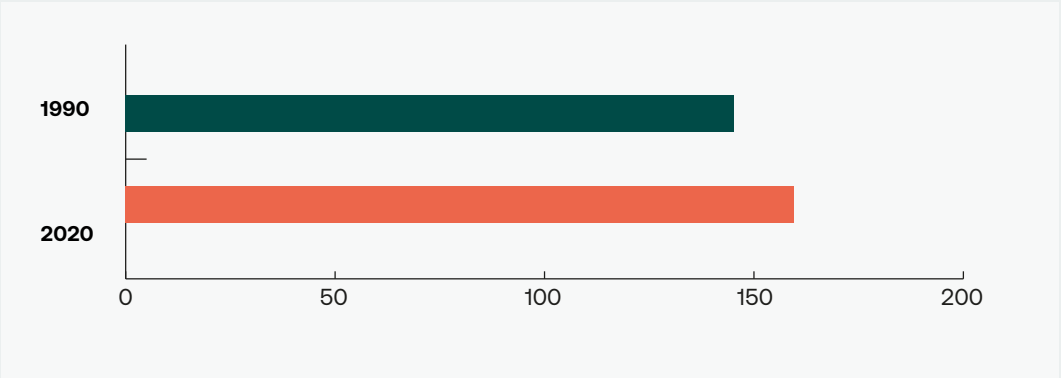
The geography of Europe is varied and covers several climate zones. Forests once covered almost the entire continent but decreased over time as a result of human activities. When agriculture expanded, forests had to give way. Forests also provided one of the few sources of energy available in pre-modern societies – wood. The expansion of agriculture played a significant role in the rapid deforestation of many European countries, to the point of total deforestation in many areas. This was a classic example of the tragedy of the commons, where the individual farmer had few incentives to preserve forests for the future, which led to increasing poverty.

By the turn of the last century many countries had instated policies that required foresters and forest companies to ensure afforestation, either by natural regeneration or by sowing and planting. As a result forest coverage slowly started to increase.

Today we see that forest area has increased by 9 per cent in the European Union during the last 30 years, and presently covers 35 per cent of the total area. The difference between countries is however extreme, ranging from 1 per cent in the case of Malta, to 66 per cent in Finland.[5]

5 State of Europe's Forests 2020, Forest Europe, p. 16.

FIGURE 2
Forest area in EU-27 Million hectares



The four countries that are covered in this report, Sweden, France, Austria and Poland, together contain 37 per cent of all forest land in EU-27. The forest coverage in these four countries range from 30 per cent in the case of Poland, to 63 per cent in Sweden. Adding two other countries that are rich in forest resources, Finland and Germany, takes the total share of EU forest land to 58 per cent. It is perhaps then not surprising that these countries all have developed strong economic activities related to forestry, and that they also have deep traditions connected to forestry.

Climate, geography, history and culture play an important role in why countries manage their forest resources differently. The boreal forests of the north have different requirements and characteristics than do the nemoral or alpine forests of Central Europe, to mention one aspect. As a result, forest management methods also differ. All forest countries highlighted in this report do however share

TABLE 1
Fellings and strictly protected forest

	Area of wooded land (million ha) (1990)	Area of wooded land (million ha) (2020)	Fellings as % of net annual increment (%) (2015)	Share of FSC/PEFC certified area of total forests (%) (2015)
Austria	3.8	3.9	87.1	79
Finland	21.9	22.4	80.4	81
France	14.4	17.4	60.0	33
Germany	11.3	11.5	76.5	69
Poland	8.9	9.5	-	75
Sweden	28	28	93.9	64
EU27	145	159	-	-

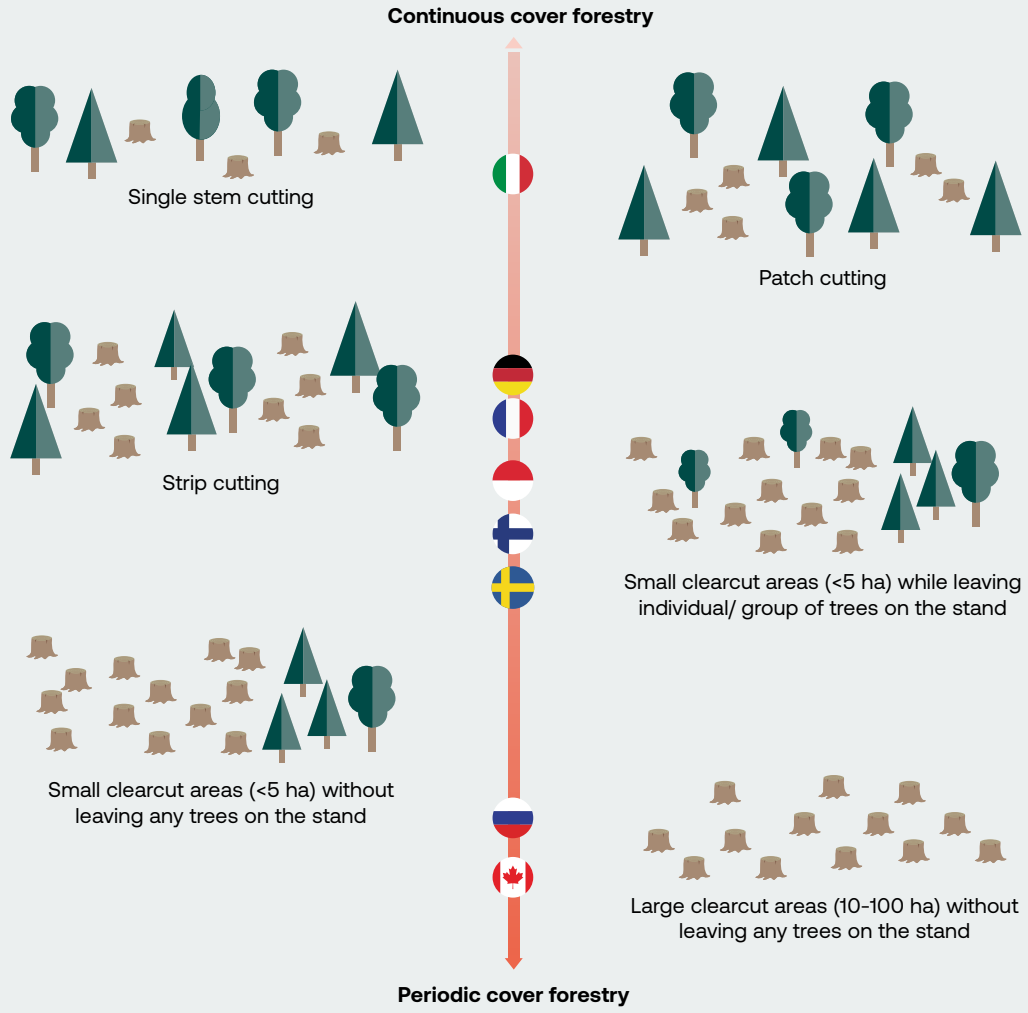
one thing: a commitment to continuously improving biodiversity, and an evidence-based view on the importance of managing forests for the future.

In the forest debate forest management is often portrayed as one of two distinct types: continuous cover forestry or periodic cover forestry. In reality, forest management types vary along a continuum from single-stem cutting all the way to large clearcut areas and plantations. The bulk of European forest countries apply some version of either patch cutting or small clearcutting, with local exceptions.

Most forest owners also combine their chosen forest management method with closer-to-nature management practices, such as leaving groups of trees to grow on the stand, promoting diversity in tree species, creating set aside areas, and leaving deadwood in the forest.

FIGURE 3

Forest management types in the EU



Austria

Austria boasts a diverse range of forests, from broadleaved and mixed forests to coniferous forests. Alpine and mountain forests are prominent due to the country's rugged terrain. The forests cover over 47 per cent of the country's federal territory, significantly exceeding the EU average.[6]

Austria's forests cover over 4 million hectares, with 81 per cent of this land in private ownership, primarily by small forest enterprises. Public ownership accounts for almost 19 per cent, managed by Österreichische Bundesforste AG. The forest industry contributes 3.2 per cent of Austria's economic output, generating 11.3 billion euros in direct gross value added. It's a key driver of employment, providing 300,000 jobs, and contributes 8.7 billion euros in taxes and levies.

The Austrian Forest Fund, initiated in 2020 with allocated means of 350 million euros, supports measures to maintain healthy forests, promote climate resilience, and harness wood as a resource for climate change mitigation. It also aids forest owners affected by bark beetles, prevents forest fires, and encourages innovative wood use, especially in construction and energy production.[7]

Austria's forestry regulations are primarily based on the Austrian Forest Act 1975, which focuses on preserving forests and promoting sustainable management.

Austria has seen an increase in forest area with over 114,000 hectares during the last 30 years.

Austria's forest industry contributes 3.2 per cent to the country's total economic output.

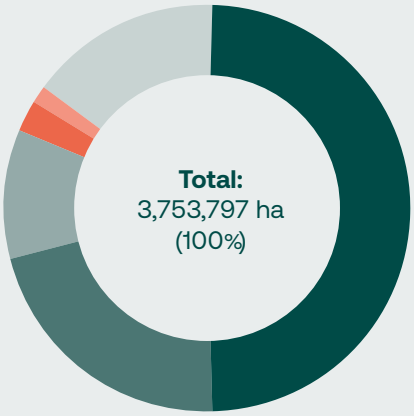
The ownership is largely private, with around 140,000 owners responsible for approximately 81 per cent of the forest area.

Forest management in Austria is enforced at the provincial level, with a focus on biodiversity and sustainable practices.

FIGURE 4

Forest areas and ownership structure in Austria 2021

Types of ownership according to cadastral map in ha*



- Private forests < 200 ha** 1,852,137 (49.3%)
- Private forests > 200 ha** 802,770 (21.4%)
- Community forests 388,152 (10.3%)
- Communal forests 94,500 (2.5%)
- Provincial forests 48,271 (13%)
- Austrian Federal Forests and other publicly owned forests 567,966 (15.1%)

* Due to different surveying methods the forest areas identified in the cadastral map differ from those of the Farm Structure Survey and of the Austrian Forest Inventory.

** Incl. church-owned forests.

6 Eurostat 2023, Area of wooded land, EFA questionnaire, 2023-11-23: https://ec.europa.eu/eurostat/databrowser/view/for_area_efa__custom_7854061/bookmark/table?lang=en&bookmarkId=860c1ec0-2299-4a78-abe8-9acc7f031d52

7 Federal Ministry of Agriculture, Forests, 2023-11-23: https://info.bml.gv.at/en/topics/forests/forest-fund.html

TABLE 2

Forest enterprises – types of management and ownership structure

1,000 hectares

	Total	Private forests <200 ha	Forest enterprises >200 ha	Austrian federal forests
Forests in yield	**3,362**	**1,909**	**1,016**	**438**
Production forests	2,947	1,747	846	354
Coppice forests	78	40	35	2
Protective forests in yield; high forests	338	122	135	82
Forests without yield	**653**	**238**	**258**	**156**
Total forest area	**4,015**	**2,147**	**1,274**	**594**

Austrian forestry and forestry methods

The concept of sustainable forest management has been practiced in Austria for generations.

Sustainable forest management guarantees that the amount of wood harvested is balanced by the regrowth of new trees, providing a foundation for expanded wood utilization and the continuous growth of European forests. It is laid down in the Austrian Forestry Act, which, apart from wood utilisation, also provides for the maintenance of the protective, beneficial and recreational effects of forests.

Timber harvesting is carried out in a sustainable way and mainly in the form of individual tree removal ("Plenterwaldbewirtschaftung"). The forest is permanently rejuvenated and afforested with tree species adapted to the site. From a size of 0.5 hectares, clear-cutting must be approved by the forestry authority.[8] This usually happens after damaging events such as storms or pest infestations. The cleared areas must then be reforested.

Climate and biodiversity

Austria's forest protection is governed by laws such as the Austrian Forest Act 1975 and the 2002 Forest Reproductive Materials Act. These laws aim to maintain forests and promote sustainable forest management. They are enforced by provincial authorities.

The "Wald schützt uns!" (Forests protect us!) program seeks to enhance the protective functions of forests, safeguarding infrastructure and habitats. It also aims to reduce the need for extensive investments in technical control systems through research and education. They recently conducted the largest investigation and status quo analysis of Austria's forests with more than 11,000 sample plots as well as satellite and digital aerial images. Despite challenges like climate change, the inventory has shown positive results:

- Austria's forest area has increased to over 4 million hectares over the past decade, with a daily growth of six hectares. Forests now cover 47.9 per cent of Austria's territory, well above the EU average.
- Broadleaved and mixed forests, along with biodiversity, are on the rise. Pure coniferous stands have decreased by 6 per cent over the past decade, while mixed broadleaved stands have increased by the same percentage.
- Deadwood, an indicator of enhanced biodiversity, has increased by 18 per cent, benefiting various species.
- The growing stock of trees continues to rise, despite challenges like storm damage and bark beetles, reaching 1.18 billion cubic meters.
- In Austria, the rate of forest growth exceeds consumption, with 89 per cent of the increment currently being harvested.[9]

8 Austrian Forest Act
9 Federal research and traning center for forest natural hazards and landscape, 2022, Fact and Figures, p. 56.

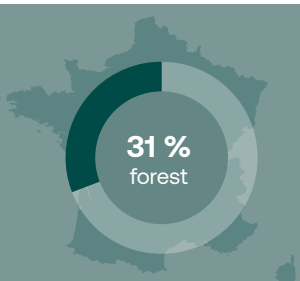
France

Forests in France are diverse and extensive, covering approximately 16 million hectares of land - representing around 31 per cent of the country's total land area. Accounting for 10 per cent of European forest cover, France has the fourth largest forest area in the EU behind Sweden, Finland and Spain.[10]

The French forests encompass a wide array of ecosystems, including humid, mountainous, and tropical regions. While deciduous trees predominate, especially in two-thirds of the forested areas, mountainous regions and poor soils feature coniferous trees.

Furthermore, the overseas territories showcase unique forest types, such as mangrove woods along the West Indian coastline, extensive tropical forests in Guyana, and mountainous forests in Reunion, as well as on the volcanic hills of Martinique and Guadeloupe. This rich diversity contributes to a remarkable level of biodiversity.

Forestry accounts for approximately 1 per cent of France's total economic output (GDP). While the forestry sector is important for employment and various industries, its direct contribution to the country's GDP is relatively small in comparison to other sectors like manufacturing, services, and agriculture. However, the indirect economic impact of forestry-related industries and the environmental benefits provided by forests make the sector a valuable component of the French economy.



Private ownership dominates French forestry, with over 3 million owners managing about 76 per cent of the forest area.

Small forest enterprises make up a significant portion, while larger properties cover 52 per cent of the private forest area.

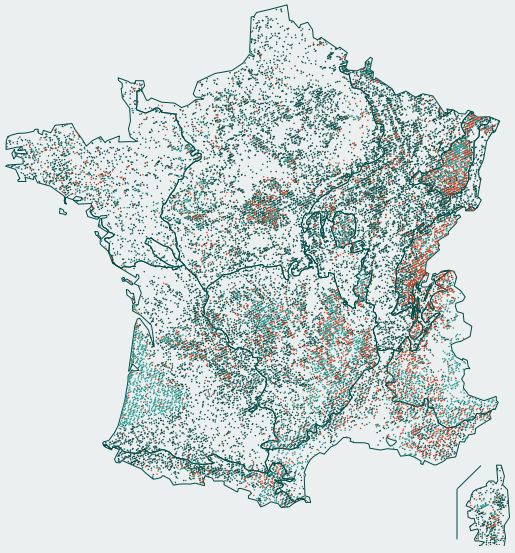
Various forest management methods are employed, with a focus on biodiversity preservation, recreational and cultural use. France emphasizes the importance of voluntary efforts in forestry.

Forestry accounts for approximately 1 per cent of France's total economic output (GDP).

Approximately 10.6 per cent of state-owned forests are designated as high-protection areas.

FIGURE 5
Distribution of Stand Composition

- Broadleaf stands 67%
- Coniferous stands 20%
- Mixed stands 13%



10 Eurostat 2023, Area of wooded land, EFA Questionnarie, 2023-11-23: https://ec.europa.eu/eurostat/databrowser/view/for_area_efa__custom_7854061/bookmark/table?lang=en&bookmarkId=860c1ec0-2299-4a78-abe8-9acc7f031d52

French forestry and forestry methods

The majority of forests in France, roughly 75 per cent, are privately owned. Of more than 3 million owners, 2.2 million own at least one hectare of forest, while about 380,000 own more than four hectares. These private owners collectively manage 76 per cent of the private forest area. Among them, 50,000 owners own over 25 hectares, which accounts for 52 per cent of the private forest. Public forests make up the remaining 25 per cent of French forests, serving specific functions related to public services and use. They contribute nearly 40 per cent of the overall timber harvest.[11]

In France, forest management is marked by a notable absence of a single dominant method or approach. Instead, there exists a multifunctional approach to forest issues designed to cater to the unique characteristics and requirements of the various forests found across the country. The different approaches to forest management can be summarized as follows:

- **Silvicultural Management:** Focused on sustainable timber production, it tailors practices to specific forest ecosystems.
- **Conservation and Biodiversity Management:** Prioritizes protecting and enhancing biodiversity through habitat restoration.
- **Ecological Restoration:** Targets damaged forests for rehabilitation and ecological recovery.
- **Recreational and Cultural Management:** Some forests are managed for leisure, tourism, hunting, and cultural events.
- **Forest Certification:** Many French forests adhere to recognized standards for sustainable and responsible management, such as FSC or PEFC certification.

The choice of which approach to implement in a given forest depends on a variety of factors, including the forest's location, ecological characteristics, ownership structure, and the objectives of the forest owner or manager. This diversity in forest management methods reflects the country's commitment to flexibility and adaptability in its approach to forestry practices.

Climate and biodiversity

Forestry in France faces imminent challenges as higher temperatures and modified water patterns will become a reality by 2050, driven by climate change. These changes pose significant threats, particularly in the distribution of tree species. While the vulnerability of forests to factors such as drought, wind, and health issues is recognized, there remain uncertainties about their localized impacts. Given the long-term nature of forestry cycles, proactive adaptation to climate change is an imperative.

France's forests play a crucial role in conserving soil and water resources. They also serve as a vital defense against natural disasters, enhance landscape aesthetics, and contribute to the quality of life for local communities.

A significant conservation initiative, Natura 2000, encompasses approximately 19 per cent of the forested area in France, covering 3.2 million hectares. This network of protected areas aims to safeguard and restore valuable habitats and species. It reflects France's dedication to conserving its natural heritage.[12]

Approximately 10.6 per cent of state-owned forests are designated as high-protection areas, where strict conservation and ecological preservation practices are implemented.

11 Geves, Forests in France, 2023-11-23: https://www.geves.fr/variety-seed-expertise/forest/forestry-in-france/
12 Geves, Forests in France, 2023-11-23: https://www.geves.fr/variety-seed-expertise/forest/forestry-in-france/

Poland

In the great forests of Poland, the predominant tree species in most regions is pine, except for in the mountainous areas with spruce, fir, and beech. Forests in Poland serve multiple functions, offering benefits like biodiversity conservation, carbon dioxide reduction, water resource protection, flood prevention, erosion control, and landscape preservation.

The State Forests in Poland play a vital role in managing these areas, including nature reserves, natural monuments, and species protection zones.

Poland's forest landscape has undergone significant changes due to factors like agricultural expansion and high timber demand. By the end of the 18th century, forests covered about 40 per cent of the land within Poland's historical borders. However, this figure decreased to less than 21 per cent by 1945, only to see a reversal following World War II.

Today, Polish forests play an important economic role, supporting the wood industry and providing jobs for approximately 375,000 individuals. This includes workers in local family businesses engaged in forestry and wood-based product processing, contributing around 2.3 per cent to Poland's GDP.[13]

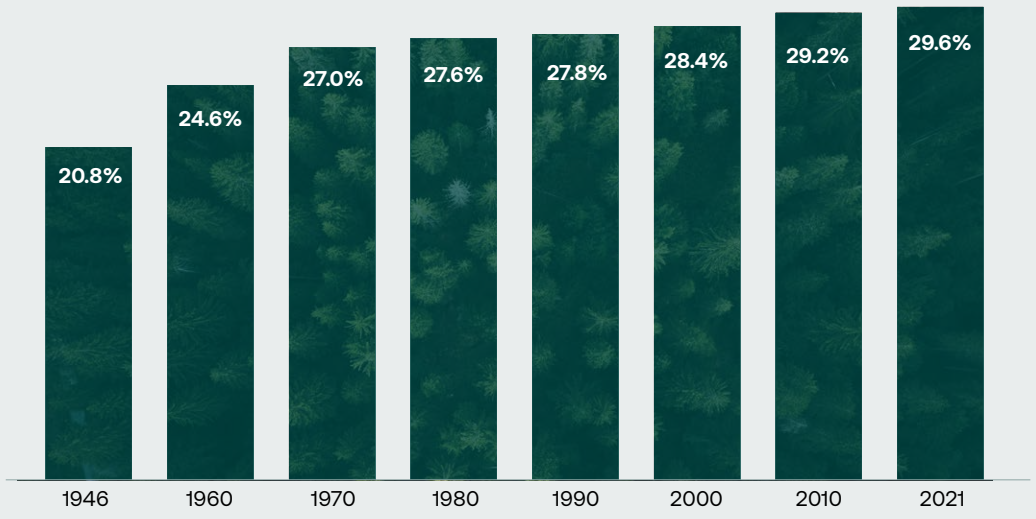
Forest management in Poland involves ten-year forest management plans, which consider ecological, social, and economic functions, including nature conservation programs.

Public consultations are integral to the forest management planning process, allowing citizens to provide input and opinions on various aspects, including recreational values and conservation.

Forest harvesting in Poland has been increasing over the years, mainly due to aging tree stands that was planted simultaneously after World War II. The average age of tree stands has been rising, leading to more trees reaching the harvesting maturity age.

FIGURE 6

Forest area in per cent of Poland's area



13 Przemysl Drzewny Research and development, 2023, Leśnictwo w Polsce (Forestry in Poland), p 47. (printed)

Polish forestry and forestry method

Forest management in Poland is carried out on the basis of forest management plans developed for forest districts for 10 years and are prepared by specialized units, including the Bureau for Forest Management and Geodesy.

Following the growing importance of forests, modern plans contain more and more elements. In addition to the description of forests and land intended for afforestation and the analysis of forest management in the previous management period, the nature protection program is an integral element today. This shows that the natural functions of the forest are treated at a level comparable to that of economic and social functions. The plan also includes the definition of tasks related to the care and protection of the forest and the creation of forest infrastructure.

Public consultations are an important element of the work on the forest management plan. At the stage of creating the plan, all citizens have the opportunity to submit comments and to express their opinion on the development, which will take into account, for example, the recreational values of places where people relax, e.g. pick mushrooms, or simply walk, run, or ride a bike.

Over the course of a decade, yearly wood harvesting in Poland has been continuously increasing, from approximately 33 million m^3 of wood to more than 40 million m^3 in the 2020s. This is mainly due to the fact that commercial tree stands in Poland have been ageing. In 1978, the average age of tree stands was 49 years. In 1995, it had increased to 55 years, and in 2022 to 64 years. Therefore, more and more trees reach the so-called harvesting maturity (cutting) age.[14]

Climate and biodiversity

Forests in Poland, as one of the most valuable elements of the environment, are protected using many forms of nature protection, including: reserves, species protection zones, Natura 2000 areas, ecological areas, etc. These facilities, in the vast majority, are located on land managed by the State Forests. All forms of forest management and protection, aimed at ensuring their durability and biological resistance, also serve to preserve genetic resources and biological diversity.

After 2015, there was a substantial increase in dead wood resources, which play a crucial role in enhancing biodiversity within forests. Between 2009 and 2014, the volume of dead wood resources in the country's forests ranged from 52 to 54 million m^3, equivalent to 5.7 to 5.9 m^3 per hectare. However, in the subsequent years, there was a significant surge in dead wood resources, with approximately 98 million m^3 of large timber (equivalent to 10.6 m^3 per hectare) recorded in 2022.

However, the declining growth rate of wood resources and the rising presence of dead wood in Polish forests, along with reduced forest stability in many areas, do not align with the expected levels of greenhouse gas absorption by forests as outlined in the European Parliament and Council Regulation 2023/839 on Land Use, Land Use Change, and Forestry (LULUCF) dated April 19, 2023, for Poland.[15]

The data shows that shortly after the reference period for the LULUCF regulation (2016-2018), the growth of resources decreased significantly. This suggests that forest ecosystems in Poland are very sensitive to climate change, and this sensitivity might increase, especially given the amount of forested land established after 1945 and the increasing die-off of major tree species that form the forests.

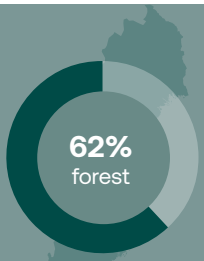
14 Przemysl Drzewny Research and development, 2023, Leśnictwo w Polsce (Forestry in Poland), p 54.
15 Przemysl Drzewny Research and development, 2023, Leśnictwo w Polsce (Forestry in Poland), p 49.

Sweden

Sweden boasts a remarkable 62 per cent forest coverage across its area, making it one of the most forested countries in Europe. The Swedish forests are diverse, ranging from boreal forests in the north to temperate broadleaf and mixed forests in the south. Coniferous trees like spruce and pine are common throughout the country, while mixed forests provide a blend of habitats for various species. Coastal forests along the extensive coastline are adapted to saltwater conditions, and mountain forests in the northern mountains are characterized by hardy trees.

Every year, the forest industry produces products with a value added of around 10.8 billion euro (value of finished product less value of input products), which corresponds to just under 2.5 per cent of Sweden's GNP.[16]

In 1993, Sweden implemented a new Forest Policy and Forest Act, emphasizing "freedom with responsibility" to balance production and environmental goals. This approach aimed to grant forest owners more autonomy while ensuring sustainable forest management. The shift was influenced by a historical reliance on voluntary forestry efforts, which gave way to increased regulations primarily driven by timber production needs. The move towards deregulation in 1993 was influenced by a desire to provide more freedom to forest owners while also addressing growing concerns about forest conservation and environmental goals, in line with international developments like the Rio Conference in 1992.[17]



Retention forestry is the prevalent method in Sweden.

Regulations emphasize "freedom with responsibility," finding a balance between forest owner autonomy and environmental considerations.

Sweden's global ranking for protected forests is lower due to its strict definition, unlike countries like Germany with broader criteria.

More than 50 per cent of Sweden's productive forest land is owned by 313,000 private forest owners.

16 The Swedish Forest Industries.2021. Skogsnäringens betydelse för välfärden (The importance of forestry for welfare), p. 2.
17 Swedish Forest Agency. Royal Swedish Academy of Agriculture and Forestry, Forest and forestry in Sweden, 2015, p. 10.

Swedish forestry and forestry methods

Sweden has 313,000 individual forest owners, who collectively own over half of the country's productive forest land. Private companies own just under a quarter, and public owners such as the government, municipalities and the Church of Sweden own 23 per cent.[18]

Sweden is an export-dependent country, and forest products are an important component of the country's exports. In 2021 the forest industry exported goods valued at 14 billion euro, making Sweden the world's fourth largest exporter of forest products. The sector accounts for 9-12 per cent of Swedish industry's total exports, turnover and value added.

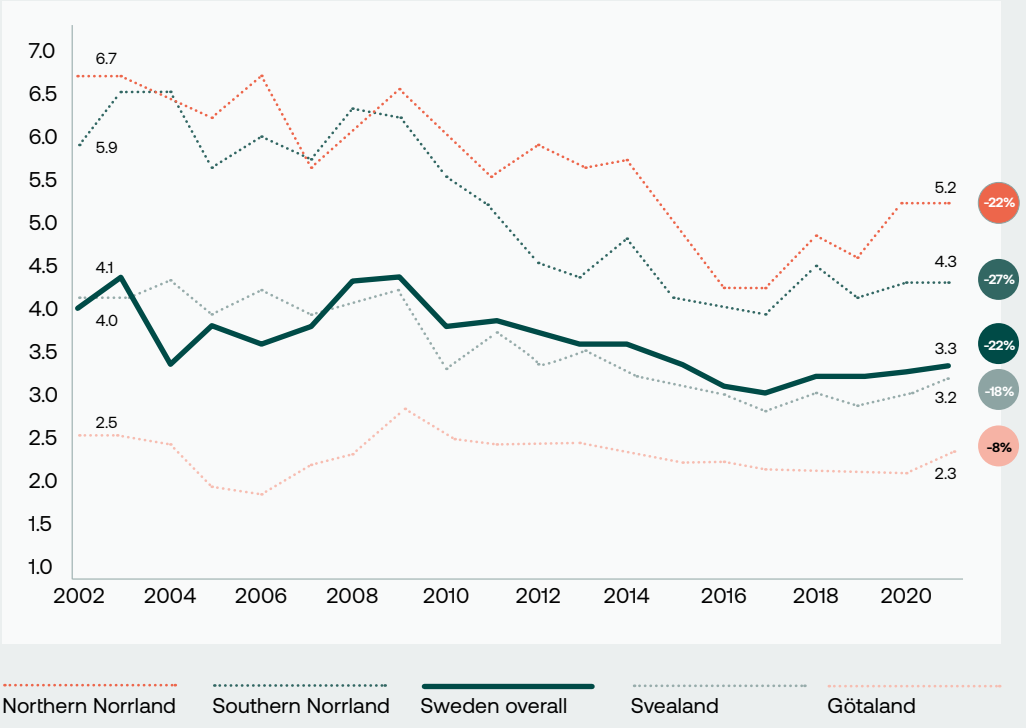
The most common method of forestry in Sweden is so called retention forestry, where a large part of the trees in a tract (or a stand) is felled and then this tract is regenerated by planting, sowing or natural regeneration. Normally small parts of up to 0.5 ha within the tract are left as retention areas for nature conservation purposes, as well as most dead trees and many living trees that are left for conservation purposes.[19]

The annual felling is approx. 95 million m³ob (spruce 55, pine 32 and hardwoods 10). The forest is growing more than the total drain, but this surplus has for some years decreased, partly due to drier forests which, mainly in southern Sweden, has reduced growth and partly due to higher felling levels and higher natural decline, due to the ongoing spruce bark beetle episode in southern Sweden.

FIGURE 7

Average felling area for final fellings larger than or equal to 0.5 hectares and change in area between 2002 and 2021

Hectares



18 Swedish Forest Agency. Royal Swedish Academy of Agriculture and Forestry, Forest and forestry in Sweden, 2015, p. 10.
19 Forest Management in Sweden, 2020, Current methods and historical background, p. 36.

Climate and biodiversity

Swedish forests have significantly improved over the past century. There were once large areas of degraded forests and low-productivity pasturelands, particularly in the southern coastal regions. Earlier mining led to heavily managed forests with short rotation periods, and northern forests had been heavily exploited. While Sweden has recovered from this landscape degradation, it still faces challenges.

For instance, the scarcity of dead wood has been a concern in Swedish forests, as many species rely on it. However, since changes in forestry laws in the 1990s, the amount of dead wood has grown by 60 per cent in non-protected forest areas. This increase is a result from both passive measures, like letting naturally fallen trees remain, and active measures, such as leaving high stumps that eventually become dead wood.

Other common environmental conservation and retention measures employed in the Swedish forestry are for example:

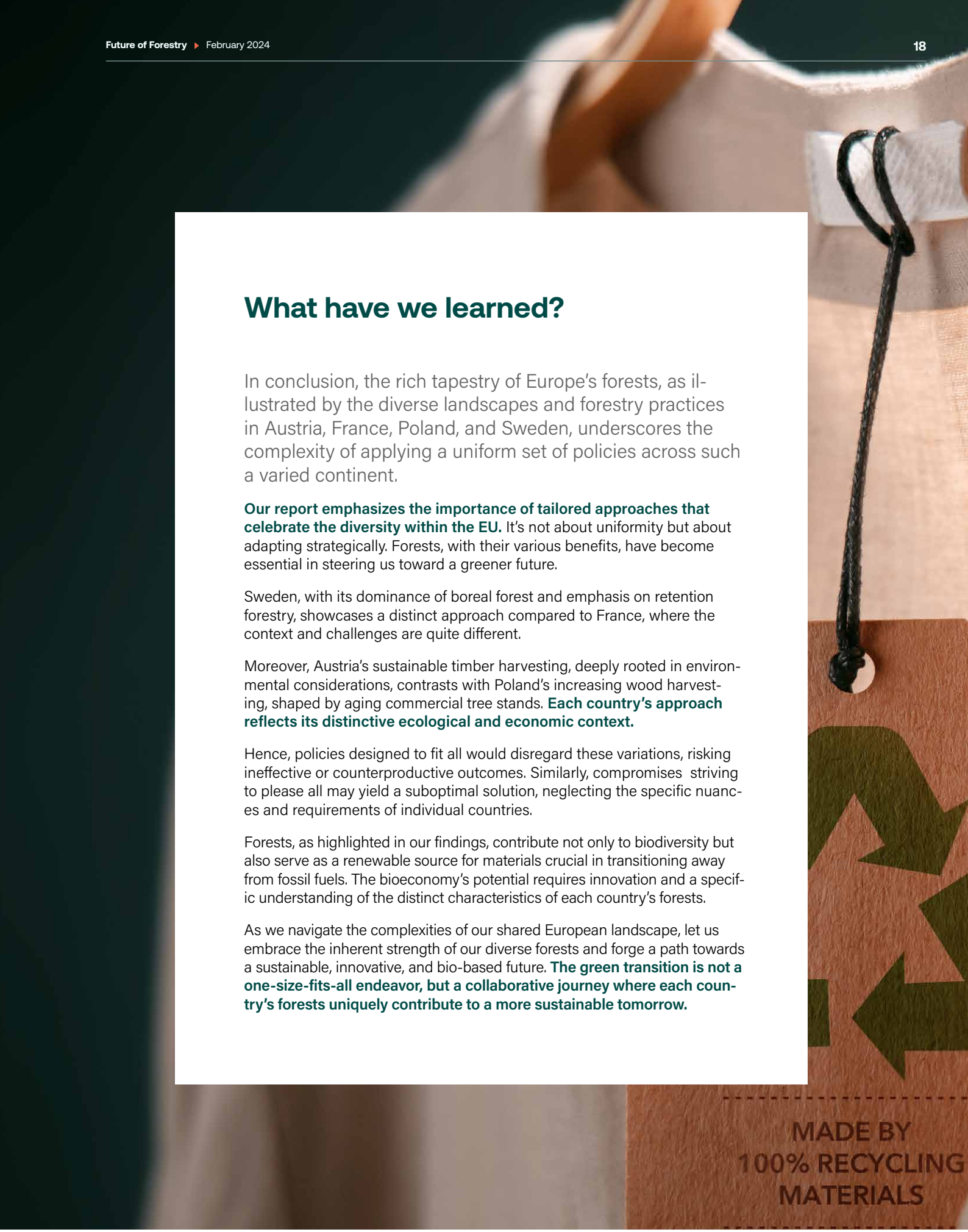
Conservation Trees and Retention Areas: These involve preserving individual trees and groups during regeneration felling to provide habitats and microclimates for diverse species.

Creating Gaps and Clearings: Intentional gaps in dense forests promote biodiversity by allowing different plant species to thrive and diversifying resources for flora and fauna.

Preserving Edge Zones: Transition areas between sensitive terrains and managed forests are left undisturbed to protect delicate ecosystems, prevent machinery damage, and maintain microclimates.

In international comparisons of protected forests, Sweden often ranks low when it comes to formally protected forest areas. This is because Sweden only considers strictly protected forests as protected, unlike countries like Germany, which include forests subject to any land use restrictions in their definition of protected forests. In total, around 27 per cent of Sweden's total forest area is exempt from production.

A common criticism of retention forestry is that it favours "monocultures" of one and the same tree species. A very small percentage of Swedish forests features only one tree species. Furthermore, modern Swedish forestry focuses on increasing the mix of broad-leaved trees in production stands. Since 1985, the share of broad-leaved-dominated forests in Sweden has grown from 6.4 to 9.2 per cent of productive forest land area.



What have we learned?

In conclusion, the rich tapestry of Europe's forests, as illustrated by the diverse landscapes and forestry practices in Austria, France, Poland, and Sweden, underscores the complexity of applying a uniform set of policies across such a varied continent.

Our report emphasizes the importance of tailored approaches that celebrate the diversity within the EU. It's not about uniformity but about adapting strategically. Forests, with their various benefits, have become essential in steering us toward a greener future.

Sweden, with its dominance of boreal forest and emphasis on retention forestry, showcases a distinct approach compared to France, where the context and challenges are quite different.

Moreover, Austria's sustainable timber harvesting, deeply rooted in environmental considerations, contrasts with Poland's increasing wood harvesting, shaped by aging commercial tree stands. **Each country's approach reflects its distinctive ecological and economic context.**

Hence, policies designed to fit all would disregard these variations, risking ineffective or counterproductive outcomes. Similarly, compromises striving to please all may yield a suboptimal solution, neglecting the specific nuances and requirements of individual countries.

Forests, as highlighted in our findings, contribute not only to biodiversity but also serve as a renewable source for materials crucial in transitioning away from fossil fuels. The bioeconomy's potential requires innovation and a specific understanding of the distinct characteristics of each country's forests.

As we navigate the complexities of our shared European landscape, let us embrace the inherent strength of our diverse forests and forge a path towards a sustainable, innovative, and bio-based future. **The green transition is not a one-size-fits-all endeavor, but a collaborative journey where each country's forests uniquely contribute to a more sustainable tomorrow.**

References

Figure 1: European forest categories
Casalegno, S., Amatulli, G., Bastrup-Birk, A., Durrant, T., Pekkarinen, A. (2011): Modelling and mapping the suitability of European forest formations at 1-km resolution, European Journal of Forest Research, 130, 971-981.

Figure 2: Forest area in EU 27
Eurostat, Area of wooded land (EFA Questionaire)
Website downloaded: 03/05/2023
https://ec.europa.eu/eurostat

Figure 3: Forest management types in the EU
AFRY report, 2023, Substitution potential and climate impact in forest value chain in the EU, p. 15. Printed edition.

Figure 4: Forest areas and ownership structure in Austria 2021
Federal research and Training Centre for Forests, Natural Hazards and Landscape, 2022, Facts and Figures, p. 64.
https://info.bml.gv.at/dam/jcr:4395efec-0a8c-493e-8911-b8a9db92f883/Facts%20and%20Figues%202022%20(barrierefrei).pdf

Figure 5: Distribution of Stand Composition
Institut National de L'Information Géographique et Forestière, Inventaire Forestier National, Mémento èdition 2023, p. 61.

Figure 6: Forest area in per cent of Poland's area
Przemysl Drzewny Research and development, 2023, Leśnictwo w Polsce (Forestry in Poland), p 43. Printed edition.

Figure 7: Average feeling area for final fellings larger than or equal to 0.5 hectares and change in area between 2002 and 2021.
The Swedish Forest Agency's statistical data base, average logging areas for final fellings larger than or equal to 0.5 hectares by region and ownership category in the years 2002-2021.
Website downloaded 24/11/2023.
https://pxweb.skogsstyrelsen.se/pxweb/sv/Skogsstyrelsens%20statistikdatabas/Skogsstyrelsens%20statistikdatabas__Avverkning/JO0312_09.px/

Table 1: Fellings and strictly protected forest
Simula, M. 2020. Forest certification: past trends and future options.
http://www.ardot.fi/Documents_2/Trends.pdf
Eurostat 2023, Area of wooded land, EFA questionnaire Source: https://ec.europa.eu/eurostat/data-browser/view/for_area_efa__custom_7854061/bookmark/table?lang=en&bookmarkId=860c1ec0-2299-4a78-abe8-9acc7f031d52

Table 2: Forest enterprises - types of management and ownership structure
Federal Research and Training Centre for Forests, Natural Hazards and Landcape 2022, Austrian Forest Inventory 2016/21.