

An EU Forest Nexus Strategy - linking our forests to biodiversity and climate solutions

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Summary

Following upon the publication of the European Commission's (EC) Communication on the EU Biodiversity Strategy for 2030, the EC announced its intention to launch a post 2020 EU Forest Strategy. The European Parliament adopted its report on the post 2020 EU Forest Strategy¹ and the Council also prepared its conclusions on Perspectives for the EU forest-related policies and EU forest strategy post 2020² as inputs to the to-be-developed EC Communication.

Our strategy intends to provide an additional input to the EC, which is based on the premise that forest does not equal to forestry. Forests provide multiple ecosystem services and timber harvesting by the forestry industry – while providing important raw material – degrades many of these services. The EU post-2020 Forest Strategy must thus consider a much wider group of sectoral inputs, from nature conservation to nature-based tourism, in order to present a balanced view about our forests in Europe (and beyond).

While some might see the EU Forest Strategy as relevant only to the traditional forest (wood) based sectors, such as the pulp, paper and increasingly the energy sector, this must rapidly change to reflect the ecological, societal and economic realities. More people recognise the benefits of forest habitats going beyond forest biomass provisioning. Hence, the EC must recognise these multiple environmental, economic and social interests in forests in the new EU Forest Strategy.

Based on scientific and civil society inputs this document outlines the following **priorities**:

1. Protected forests managed strictly for conservation protect various ecosystem services, and the consideration of these forests as unmanaged is therefore misleading. Protection for non-extractive management is a legitimate approach, which – while proscribing commodity production – ensures multiple ecosystem service benefits beyond providing timber.
2. Remaining primary³ and old-growth forests must be immediately protected within larger intact forest landscapes.
 - Additionally, restoration of the naturalness of forests in general, including attributes (with legacies) of primary forests, will help to increase the cover of strict protection of forests with significant conservation value up to 15% of Europe's total forest cover.
3. A clear distinction is needed between the management goals of forests for different purposes.
 - Forests managed for protection should maximise the provision of ecosystem services, including climate regulation, carbon storage and biodiversity.

¹ https://www.europarl.europa.eu/doceo/document/TA-9-2020-0257_EN.html

² <https://data.consilium.europa.eu/doc/document/ST-12695-2020-REV-1/en/pdf>

³ IUCN definition of primary forest: "Primary forests are naturally regenerated forests of native tree species, whose structure, function and composition are dominated by ecological and evolutionary processes, including natural disturbance regimes. Primary forests are differentiated based on characteristics of condition of the ecosystem which is underpinned by its integrity. Deviation of these characteristics of condition from the natural state reflects the impact of human activities and their resulting pressures."
https://www.iucn.org/sites/dev/files/content/documents/iucn_pf-ifl_policy_2020_approved_version.pdf

- Forests managed for commodity production should maintain a rate of harvesting at or below the rate of growth; the annual removal of biomass should not exceed annual accumulation of biomass, maximise the accumulated carbon storage and complement of biodiversity.
4. With reference to the EU Green Deal, the post 2020 EU policy framework must recognise the various roles and benefits of forests beyond the provisioning of forest biomass, and the losses of other ecosystem services that occur when forest biomass is harvested.
 5. The economic pressure on forests must be eased through re-considering the EU Bioeconomy Strategy and removing forest biomass from the Renewable Energy Directive.
 6. Forest protection must incorporate and maintain (a) natural processes by preventing extractive management, (b) natural disturbance regimes and associated dynamic processes, (c) habitat diversity within the landscape; long-term conservation goals and conservation-oriented management choices should take this habitat diversity into consideration⁴
 7. Protected forest areas must be connected to other forest types across the landscape, and forest cover increased through proforestation⁵, and strategically designed reforestation and afforestation activities.
 8. Extractive management of forests for commodity production needs to be based on ecologically-sound practices that promote a shift to low-impact management of forests and replace the widespread application of conventional, intensive management operations, which can result in forest degradation and, in some cases, deforestation.
 9. Afforestation undertaken using sound ecological principles can help reduce the economic pressure on natural and semi-natural forests; it must not impact the natural and cultural values of other ecosystems.
 10. The EU Forest Strategy must recognise the difference between maintaining a forest carbon balance (Net Ecosystem Production) and maintaining the carbon stocks in a forest biome over time (Net Biome Production). Forest carbon emissions arising from industrial commodity production are not the same as those originating from natural processes of forest succession.
 - The EU Forest Strategy must reward protection of carbon stocks in primary and old-growth forests and across forest biomes over time, in addition to the gains from annual flows in forests managed for commodity production.

The **key recommendations** in the document are the followings

1. The EU Forest Strategy must establish priority actions which contribute to improving the ecosystem integrity and resilience of forests in the EU. These actions increase protection in order to improve the conservation status of forest habitats.
2. For the benefits of forest to genuinely contribute to a “greener economy” – including the post COVID recovery – and a climate neutral EU, the EU Forest Strategy must

⁴ Götmark, 2013 https://www.gu.se/sites/default/files/2020-11/Gotmark2013_review.pdf

⁵ <https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full>

reflect the multiple benefits and the increasing societal concern about forests, and recognise the full array of ecosystem services and benefits of forests.

3. The consultation about the EU Forest Strategy must involve a wider range of sectoral actors than the traditional forest biomass-based industries.
4. Clear statistical, EU-wide reporting is needed to differentiate between the various forest types from primary / old-growth forest, semi-natural forests to multi- or mono-culture tree plantations.
5. The EC and MSs must improve the consistency of reporting about the status and use of forests including the timber removal. This will help to decrease the current high volume of unaccounted sources within the EU Wood Resource Balances.
6. Harmonised EU policies, including the EU Forest Strategy, guarantee the protection and restoration of forests as a nature-based solution to the interrelated biodiversity and climate crises through lowering the economic pressure for forest biomass provisioning.
7. Along with the EU Biodiversity Strategy for 2030, the EU Forest Strategy must recognise the shared policy competence on forests and contribute to an overall policy framework that guarantees improved protection and recovery of forest resilience across the EU and beyond.
8. To reverse the worrying trends, the EU Forest Strategy must promote more resilient, functioning forest ecosystems by 2030, which can be attained through two strong interlinked elements:
 - a. 15% of the EU's forests need strict protection, including the immediate protection of primary and old-growth forests, with the concept of increased core protected areas surrounded by appropriate buffers that provide functional connectivity;
 - b. semi-natural forests under extractive forest management must have more biodiversity-friendly management practices delivering higher climate mitigation benefits.
9. Along with the EU Biodiversity Strategy for 2030, the EU Forest Strategy must recognise the shared policy competence on forests and contribute to an overall policy framework that guarantees improved protection and recovery of forest resilience across the EU and beyond.
10. The new EU Forest Strategy must promote management practices that recognise strict protection with non-intervention also as a forest management choice delivering multiple benefits.
11. The EU Forest Strategy must establish the framework for utilising payments for ecosystem services as an alternative to the direct market values. Such a move will help to reward protection of carbon stocks for instance in primary / old-growth forests, not only the gains from annual flows.
12. The EU Forest Strategy must enforce legalising the MSs' wood resource balances and guarantee that the bioeconomy is not measured by the volume of timber used in Europe but by the higher added value of the products. This will contribute to securing more jobs, while protecting more forests.

1. We must improve the resilience of Europe's forest

As the interacting climate and biodiversity crises continue, we need forests more than ever to maintain stable ecosystems and their provision of ecosystem services. This requires a paradigm shift in the way we understand and manage forests in Europe and beyond. The post 2020 EU Forest Strategy must articulate the reasons for, and the design of, this shift.

Forests are the largest terrestrial ecosystem in the EU covering around 39% of the land area⁶. Based on land cover statistics, one might think our forests are doing well, but this measures only extent of forest cover, and in reality, the EU's forests are in dire condition in terms of their ecosystem integrity and resilience. While the area of forests has been increasing in Europe with more tree planting and revegetation, measures of area in a land use category do not tell us about the quality or condition of these ecosystems.

The current condition of forest ecosystems in the EU is the result of natural and human-induced disturbances taking place since the mid-Holocene. An assessment on forest status in relation to the degradation of ecosystem integrity and the risk of approaching climate tipping points in the next decades under different climate change scenarios is badly needed. Due to legacies of past overexploitation, forests in many parts of Europe, for instance in South-Eastern margins are particularly exposed to such risk. This goes hand-in-hand with past soil erosion, depletion and its future restoration.

Based on Forest Europe's Status of Europe's Forest (SoEF, 2020) report, only 2,2% of forests remained undisturbed by humans by 2020 indicating significantly low natural conditions. Several recent reports^{7,8,9} highlight significant problems with the ecosystem integrity, biodiversity status and resilience of our forests and their conservation status. While some indicators may be improving, such as forest area, growing stock and productivity, indicators of defoliation and species abundance and richness are declining, and these are critical to maintain ecosystem resilience and the provision of ecosystem services.

Although the SoEF reported 94% of our forests as semi-natural¹⁰, this is contradicted by other findings in the same document, which is that 33% of the forests are dominated by single tree species indicating higher proportion of planted tree monocultures. Hence, in reality a large proportion of European forests are not semi-natural and this is potentially misleading to understand the quantity and quality of benefits from our forests. Combined with the significant proportion of forests with even-aged structure (75%), the reality is that the majority of forests are not capable of supporting the full complement of biodiversity for the ecoregion, are not resilient to climate change and other perturbations, and are not providing the high quality benefits, ecosystem services of natural forests. Such contradictions in reported status and trends call into question the reliability of data about

⁶ <https://forest.eea.europa.eu>

⁷ <https://www.nature.com/articles/s41586-020-2438-y>

⁸ <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020>

⁹ https://foresteurope.org/wp-content/uploads/2016/08/SoEF_2020.pdf

¹⁰ SoEF definition: "Semi-natural forests are neither undisturbed by man nor plantations but display some characteristics of natural ecosystems."

the definition and proportion of semi-natural forests and the appropriateness of characteristics under this classification.

The overall assessment for EU forests shows poor conditions and there were serious concerns regarding upwards trends of several pressures and degrading condition indicators. The comparison of EEA State of Nature in EU reports^{11,12} actually shows a slight decline of their conservation status, resilience and the ecosystem services they are supposed to provide.

The Habitats Directive's EU level assessment of the conservation status of 81 forest habitats, which covers 28% of the EU's forest area, concluded that 14% are in good (or favourable) conservation status (EEA, 2020). The remaining habitats are in poor status (54%), bad status (31%) or unknown (1%). In addition, the assessment also indicates that forestry management for commodity production is the dominant pressure reported for most of the forest habitat types, which suggests that reduction in logging is needed to improve the status of forest habitats and resilience. The Mapping and Assessment of Ecosystem Services (MAES¹³), which assesses the entirety of EU's forests, shows similar trends in forest conditions.

Exacerbating these current trends are the interacting impacts of climate change, its indirect effects, the effects of pollutants, and the constantly increasing demand for forest biomass driven by (a) the demand for biomass-based energy, which has been increasingly questioned as a renewable energy source^{14,15} and (b) the EU Bioeconomy Strategy. Growing demand for wood will result in further increasing forest area clear-cut¹⁶, shorter rotation periods, and greater use of exotic species. These are the factors causing further decline in the conservation status and resilience of forest ecosystems

These are worrying, because the increased area of tree plantations and spontaneous reforestation do not compensate for loss of natural forests, where natural disturbances are integral parts of the ecosystem dynamics. These natural forests are substantially different ecosystems to human-disturbed forests¹⁷ and they provide much greater and more diverse ecosystem services, including a much greater contribution to mitigating the biodiversity and climate crises.

The recent JRC report on mapping old-growth and primary forest in Europe described these places as "the natural heritage of Europe, as the ancient temples are for our culture."¹⁸ The report found 4.9 million hectares of old-growth forest, which may seem a lot. On the contrary these forests are "in fact rare, small and fragmented, only making up

¹¹ <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu>

¹² <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020>

¹³ https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/index_en.htm and <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/mapping-and-assessment-ecosystems-and-their-services-eu-ecosystem-assessment>

¹⁴

https://publications.jrc.ec.europa.eu/repository/bitstream/JRC109869/jrc109869_biomass_report_final2pdf2.pdf

¹⁵ <https://publications.jrc.ec.europa.eu/repository/handle/JRC122719>

¹⁶ <https://ec.europa.eu/jrc/en/news/recent-surge-eu-forest-harvesting-according-jrc-study>

¹⁷ <https://www.diva-portal.org/smash/get/diva2:1189981/FULLTEXT01.pdf>

¹⁸ https://ec.europa.eu/environment/news/earth-day-new-report-shows-there-are-still-pristine-forests-europe-and-calls-their-mapping-and_en

3% of the EU’s total forested area and 1.2 % of the EU land.” The JRC argues that their protection “is vital for preserving biodiversity and mitigating climate change”.

The degradation in forest condition is of great concern and not only points to the need for policy and management reform, but also to utilise the full array of ecosystem services of forests.

Recommendation: The EU Forest Strategy must establish priority actions which contribute to improving the ecosystem integrity and resilience of forests in the EU. These actions increase protection in order to improve the conservation status of forest habitats.

2. The many benefits from forests

Forests are mistakenly linked to one single economic sector, forestry, which extract raw materials of wood and focus on only a single provisioning service of the many services provided by forests. However, there should be no single economic sector with monopoly over our forests, which benefit all of society, providing resilience and capacity for adaptation as the climate, landscape and environment change.

Forests, and especially primary forests¹⁹, provide carbon storage (as recognised also in the EU Biodiversity Strategy for 2030); regulate and filter the water supply; mitigate flood and erosion hazards; regulate and buffer microclimate; provide habitat for an overwhelming number of species, including pollinators; and provide nature-based recreation. These supporting, regulating and cultural ecosystem services provide extensive benefits to society and the economy, and should be considered in addition to forest biomass provisioning.

The Millennium Ecosystem Assessment (MEA), one of the most important projects initiating the proliferation of the ecosystem services concept²⁰, uses four categories when defining specific ecosystem services (see table below).

Provisioning Services Products (eg. fuelwood) obtained from ecosystems	Regulating Services Benefits (eg. climate regulation) obtained from regulation of ecosystem processes	Cultural services Non-material benefits (eg. recreation and ecotourism) obtained from ecosystems
Supporting services Services (eg. soil formation, nutrient cycling) necessary for the production of all other ecosystem services		

Based on the above, we argue that the forest-based sector holds a much wider meaning and includes also those that take care of and benefit from the other ecosystem services provided by forests. If timber removal from forests is forbidden through strict protection,

¹⁹ Keith H, Czucz B, Jackson B, Driver A, Nicholson E, Maes J 2020. A conceptual framework and practical structure for implementing ecosystem condition accounts. One Ecosystem 5: e58216

²⁰ <http://www.millenniumassessment.org/en/History.html>

it will not result in losing multiple function of forests (see further description based on UN SEEA in the Annex).

The European Parliament report on the EU's role in protecting and restoring the world's forests²¹ stresses "the need to recognise the EU's competences, responsibility and funds available in the area of forest protection, including European forests as part of the world's forests, in the framework of EU environmental policy". Dealing with forests is not only a shared competence between the EU and Member States, but also involves various interest groups and sectors from forestry to nature conservation, from water management to tourism. This report also acknowledges the benefits derived for our society far beyond the provisioning service of providing timber. It calls on the "Commission and Member States to recognise that the protection of native forests provides an outstanding climate mitigation benefit, deriving from the size and longevity of their ecosystem carbon stocks".

As we are facing with the intertwined biodiversity and climate crises, the two major, distinct roles in climate change mitigation of forest must particularly be recognised in the EU Forest Strategy. First, forest sequesters atmospheric carbon through photosynthesis, and second, stores the carbon in biomass and soils.

The critical role of natural forests for climate change mitigation is their capacity to maintain accumulated carbon stocks in stable, resilient and long-term reservoirs that help to maximise carbon stocks in the biosphere and thus reduce carbon in the atmosphere. Managing forests for conservation and continued growth provides the greatest carbon storage and thus the greatest mitigation benefit. Keith et al (2021) argues that the annual rate of sequestration is a flow metric, and thus not the appropriate metric to assess mitigation benefit²².

Primary forests store 30–70% more carbon than forests managed for commodity production^{23, 24, 25}. In addition, the carbon stored in primary forests is more stable and secure because of their higher levels of biodiversity and ecosystem integrity that confer greater resistance, resilience and adaptive capacity to natural disturbances and environmental change²⁶.

When forests are managed for conservation and continued growth, and are not harvested, they continue to sequester and store carbon. Older trees continue to take up carbon as they age, with large old trees contributing approximately half of the mature forest biomass worldwide^{27, 28}.

²¹ https://www.europarl.europa.eu/doceo/document/TA-9-2020-0212_EN.html

²² Keith H, Vardon M, Obst C, Young V, Houghton RA, Mackey B. 2021 Evaluating nature-based solutions for climate mitigation and conservation requires comprehensive carbon accounting. *Science of the Total Environment* 769:144341

²³ both forest types averaged across their age distribution resulting from natural or human disturbance regimes

²⁴ H. Keith et al., "Managing Temperate Forests for Carbon Storage: Impacts of Logging Versus Forest Protection on Carbon Stocks," *Ecosphere* (2014) 5(6): 1 – 34.

²⁵ Mackey B, D.A. DellaSala et al., "Policy Options for the World's Primary Forests in Multilateral Environmental Agreements," *Conservation Letters* (2014) 8(2), 139–147. doi: 10.1111/conl.12120

²⁶ Damon B. Lesmeister et al., "Mixed-Severity Wildfire and Habitat of an Old-Forest Obligate," *Ecosphere* (2019) 10 (4) e02696. <https://doi.org/10.1002/ecs2.2696>

²⁷ James A. Lutz et al., "Global Importance of Large-Diameter Trees," *Global Ecology and Biogeography* 27, no. 7 (2018) DOI: 10.1111/geb.12747

²⁸ Stephenson, N. L., Das, A. J., Condit, R., Russo, S. E., Baker, P. J., Beckman, N. G., . . . Zavala, M. A. (2014). Rate of tree carbon accumulation increases continuously with tree size. *Nature*, 507, 90–93.

Protection and restoration of functioning forest ecosystems is needed to maintain their capacity as sinks as they absorb approximately a quarter of the human-generated CO₂ emissions²⁹. However, these sinks are becoming saturated and ongoing deforestation and degradation is reducing their capacity for uptake. Additionally, the carbon uptake by ecosystems essentially replaces the amount of carbon depleted from the biosphere by human activities in the past and cannot offset fossil fuel emissions³⁰.

The EU Forest Strategy must recognise that It is the carbon stock in the atmosphere that is critical in determining the impact on the climate. Conversely, it is the accumulated carbon stock in the biosphere that determines the mitigation benefits. Carbon stocks in the biosphere should be counted as the long-term average stock of ecosystems at a landscape scale. This is the key metric by which to assess the exchange between the biosphere and atmosphere. In contrast, the metric of net carbon balance based on the annual rates of flow, as emissions and removals, between the biosphere and atmosphere is not an adequate metric to assess mitigation outcomes. Both the spatial and temporal context of the carbon change metric must be taken into account, covering landscape scales and long timeframes that include the impacts of disturbance regimes to determine the net biome production as the cumulative change in carbon storage of the biosphere. If the carbon stocks in the biosphere are not known, or not counted completely, then the potential for losses or gains due to human activities cannot be evaluated fully³¹.

Evidence of the impact of changing forest management on the carbon balance is seen in the greenhouse gas inventory for a temperate forest region with high forest cover, the Australian State of Tasmania. The LULUCF sector used to be a source of $\sim 10\text{MtCO}_{2_e}\text{yr}^{-1}$ due mainly to timber harvesting. However, a change in forest management occurred over a couple of years due to a coincidence of economic and social factors leading to a downturn in production. This resulted in the LULUCF sector becoming a sink of $\sim 10\text{MtCO}_{2_e}\text{yr}^{-1}$, and thus the reduction in timber harvesting resulted in a mitigation benefit of $20\text{MtCO}_{2_e}\text{yr}^{-1}$.³²

Recommendation: For the benefits of forest to genuinely contribute to a “greener economy” – including the post COVID recovery – and a climate neutral EU, the EU Forest Strategy must reflect the multiple benefits and the increasing societal concern about forests, and recognise the full array of ecosystem services and benefits of forests.

Recommendation: The consultation about the EU Forest Strategy must involve a wider range of sectoral actors than the traditional forest biomass-based industries.

²⁹ <https://www.ipcc.ch/srccl/>

³⁰ Mackey B.G., Prentice I.C., Steffen W, Lindenmayer D.B., House J, Keith H., Berry S.L. 2013. Untangling the confusion around land carbon science and climate change mitigation policy. Nature Climate Change 3: DOI: 10.1038. <https://www.nature.com/articles/nclimate1804>

³¹ Keith H., Mackey B.G., Berry S., Lindenmayer D.B., Gibbons P. 2010. Estimating carbon carrying capacity in natural forest ecosystems across heterogeneous landscapes: addressing sources of error. Global Change Biology 16:2971 - 2989.

³² Mackey B.G., Prentice I.C., Steffen W, Lindenmayer D.B., House J, Keith H., Berry S.L. 2013. Untangling the confusion around land carbon science and climate change mitigation policy. Nature Climate Change 3: DOI: 10.1038. <https://www.nature.com/articles/nclimate1804>

3. New deal for forest

3.1. Seeing the forest from the trees

The practical recognition of ecosystem services clearly requires a better understanding of what constitutes a forest. A forest is not a collection of trees, but a complex ecosystem defined by natural combinations and interactions among flora, fauna and microorganisms, and their interactions with the abiotic environment, which collectively can be termed its 'ecosystem integrity'. Forests have been formed/shaped during millennia in relation to natural conditions and long-term natural processes to which all forest species have evolved and adapted.

In this understanding, "Tree plantations are artificial forests that differ greatly from natural ecosystems in terms of their structure and function."³³ Therefore, differentiating forest (tree) plantations (of both native and exotic species) from other forests will be worthwhile in order to improve the knowledge and awareness about the status of forests in Europe.

Primary forests, including all seral stages (old-growth stage as well as naturally disturbed early seral stage), in the temperate zone (Europe) are the most depleted of all forest biomes (IPBES). Yet areas of long vanished primary forests have the potential for recovery if we take urgent action to support the protection and recovery of our oldest and most complex remaining natural forests. By doing so we will increase the stability and resilience of our natural forest ecosystems, their adaptive capacity, the provision of high-quality ecosystem services including the magnitude and longevity of their carbon stocks and value for biodiversity recovery and persistence.

Recommendation: Clear statistical, EU-wide reporting is needed to differentiate between the various forest types from primary / old-growth forest, semi-natural forests to multi- or mono-culture tree plantations.

3.2. Improving evidence base for decision making

Trustworthy information about the status and utilisation of forests, such as the recent MAES report by JRC³⁴, are key for responsible decision making. Without the existence of good quality, consistent and available data, policy and financial decision makers cannot make informed decisions. However, the current datasets are far from being consistent.

The recent EU Joint Research Centre report on woody biomass for energy³⁵ found that "(s)tatistics on sources and uses of woody biomass for energy are found in numerous reporting schemes with different scope, coverage, aggregation levels, completeness and reporting units." One of the key messages of the report, which appears on various pages, is a call for better data reporting and management in order to improve consistency across datasets. Despite of efforts through the EU Timber Regulation, the JRC (2018)³⁶ also

³³ https://www.cifor.org/publications/pdf_files/Books/BKanninen0102.pdf

³⁴ <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/mapping-and-assessment-ecosystems-and-their-services-eu-ecosystem-assessment>

³⁵ https://publications.jrc.ec.europa.eu/repository/bitstream/JRC122719/jrc-forest-bioenergy-study-2021-final_online.pdf

³⁶ https://knowledge4policy.ec.europa.eu/publication/wood-resource-balances_en

reported an increasing volume and proportion of unaccounted wood in the wood resource balances of the EU28.

Therefore, the precautionary principle should be taken into account until the information about timber removal, wood use, regeneration and forest condition are consistent.

The Forest Information System for Europe (FISE)³⁷ must be further developed in order to provide up-to-date information on the overall status (including resilience, ecosystem integrity, quality and quantity of ecosystem services and uses) in terms of the condition of their ecological characteristics, and the use or purpose for management of our forests. To realize such a system and make it an effective tool to monitor forest management and evaluate alternative management options, we must build a framework of forest status at the regional level. An appropriate framework is the SEEA Ecosystem Accounts that record ecosystem types in terms of their spatial extent, condition and land use.

The EU nature directive reports, e.g. the national Article 17 reports, which are the basis of the EEA State of Nature in EU report, are important documents on the biodiversity status of EU forests and should play a significant role at both national and EU-level decision making. This data source must of course be in harmony with the forest related information available on a national level, on the EUROSTAT datasets (both energy and forest removal) and information provided through the Forest Europe 5-yearly State of Europe's Forest report.

Consistent data will also help to run EU wide communication to the public and business sector to increase the knowledge and understanding about how forest ecosystems function and what economic opportunities exist linked to forests.

An additional step to improve our information and knowledge would be linked to a change in statistical reporting. Reporting of forest ecosystem types should be differentiated according to their status and use, for example tree plantations, semi-natural forests, and natural forests.

Recommendation: The EC and MSs must improve the consistency of reporting about the status and use of forests including the timber removal. This will help to decrease the current high volume of unaccounted sources within the EU Wood Resource Balances.

3.3. Policies that help forests to recover

Many policies influence the state of forests and should be considered under the EU Forest Strategy: environmental (including the nature directives^{38, 39} or the water framework directive⁴⁰), climate, energy, tourism, bioeconomy and recreation. These policies must point in the same direction at the EU and national level:

- guarantee the protection and restoration of forests as a natural solution to the interrelated biodiversity and climate crises through lowering the economic pressure for forest biomass provisioning.

³⁷ <https://forest.eea.europa.eu/>

³⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01992L0043-20130701>

³⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147>

⁴⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

The European Commission adopted an EU Communication on Stepping up EU Action to Protect and Restore the World's Forests on 23 July 2019⁴¹. This was followed by the European Parliament adopting its resolution on the EU's role in protecting and restoring the world's forests of 16 September 2020⁴². The overwhelming support to this resolution in the European Parliament provides the popular mandate to act for the preservation and restoration of the world's forests including the EU's forests.

The communication acknowledges that “(d)espite all efforts so far, conservation and sustainable use of forests cannot be ensured by current policies”. The document also recognises that in order to step up actions for forests, the various policies on forests, biodiversity, climate and environment in general must be harmonised.

The ongoing debate about the policy competence on forest in the EU does not help that! Frans Timmermans in a letter to the President of CEPF, confirmed the shared competence for forests between the MSs and the EC. His letter stated that “the EU has a range of competences that may be related to forests such as climate, environment, rural development.” He also added that “(w)ithin these areas of shared EU competences, forests and forestry certainly do not fall exclusively within the competency of Member States”.

The policy framework must recognise the role of forests as a nature-based solution to the intertwined biodiversity and climate crises. The new EU Forest Strategy can help to maximize biodiversity preservation, the full development of the complexity of ecosystem functions and resulting multiple benefits to people, including climate resilience and mitigation, stable ecosystems with adaptive capacity, and maintenance of ecological processes through the soil – plant – atmosphere system⁴³.

The policy framework must also recognise that forests do not necessarily require active management interventions!

As explained earlier, forests are types of ecosystems that provide multiple ecosystem services, and we have to differentiate that from forestry, the economic sector, which benefits from one group of products derived from a single ecosystem service provided by forests or tree plantations. Given the multiple ecosystem services provided by forests, there should be no one sector that dominates how we manage our forests. Protecting forests, even with strict, non-intervention management must be recognised as a management practice!

This perspective highlights the greater benefits from forests with greater ecosystem integrity - especially primary forests.

Recommendation: Harmonised EU policies, including the EU Forest Strategy, guarantee the protection and restoration of forests as a nature-based solution to the interrelated biodiversity and climate crises through lowering the economic pressure for forest biomass provisioning.

Recommendation: Along with the EU Biodiversity Strategy for 2030, the EU Forest Strategy must recognise the shared policy competence on forests and contribute to

⁴¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565272554103&uri=CELEX:52019DC0352>

⁴² https://www.europarl.europa.eu/doceo/document/TA-9-2020-0212_EN.html

⁴³ The European Green Deal can become a catalyst for EU citizens to create a society that consumes less and grows in other than material dimensions. However, this document is not meant to get into this aspect in greater details <https://www.eea.europa.eu/themes/sustainability-transitions/drivers-of-change/growth-without-economic-growth>

an overall policy framework that guarantees improved protection and recovery of forest resilience across the EU and beyond.

4. Priorities for the future of forests

In order to improve the resilience of forests in Europe, we need better protection, allow natural forest to recover, restore connectivity and ease the pressures. We argue that the EU Forest Strategy must provide the framework for an EU wide, coordinated action, which is implemented by each Member State. Our document defines 5 strategic priorities, which will secure resilient forest ecosystems for future generation through protecting, restoring and caring for forests by easing the economic pressure on forests.

4.1. Preserving forests in Europe

The EU Biodiversity Strategy for 2030, following the CBD zero draft document, calls for the protection of 30% of EU's terrestrial areas with 10% strict protection. Forest habitats are part of this ambition to enlarge and improve protection. The EU Forest Strategy should also acknowledge that the protection of native forests provides an outstanding climate mitigation benefit, deriving from the size and longevity of their ecosystem carbon stocks

Given their importance, as discussed above, to support this biodiversity goal we need at least 15% of total forest cover in Europe strictly protected with non-intervention management and with conservation management that aims to re-establish natural forest conditions for eventual non-intervention management. This is less than half of the publicly owned forests. The current ownership structure in the EU with 40% public forests allows prioritising nature conservation in the state-owned forests. However, protection of forests on privately-owned land may be necessary to achieve representation of all forest types, and hence systems to incentivise protection will be needed.

The selection of strictly protected areas (i.e. managed purely for conservation and not commodity production) will be key. These areas must be biodiversity and carbon rich ecosystems preferably spread across the biogeographic regions of the EU. Existing primary and old-growth forest areas will be the easiest target areas that give the most benefit from protection, but others that are in the most mature state will also be key. An assessment of current and potential strictly protected areas is needed to ensure that sites are located in representative forest ecosystem types, not merely meeting an area target. Design of the protected areas in the landscape context should incorporate the principles of connectivity to create functional networks. Active restoration measures might be applied to speed up the re-creation of missing habitats, structures and ecosystem functions.

The effective protection of the selected sites requires proper enforcement and effective management as well. Strict protection will allow development/restoration of dynamic functioning forest ecosystems with the full array of species composition and long-lived, stable carbon stocks in plants and soils. This management approach should also contribute to improve the landscape heterogeneity and support the EU focus on landscape

planning through the European Landscape Convention⁴⁴. This decreases the vulnerability of ecosystems to natural disturbances⁴⁵.

Those forests that contribute to meet the overall 30% target, but are not strictly protected and allow minimal commodity harvesting, must fit into the definition of the hierarchy of protected area as defined by the CBD and IUCN^{46,47}. In protected areas where logging is ceased, these forests will be allowed to mature. Proforestation⁴⁸, which allows previously logged natural forests to grow old, along with other conservation measures⁴⁹ must be recognised as a management choice to recover biodiversity, ecosystem integrity and stable, long-lived carbon stocks. It should be prioritised over afforestation and reforestation.

Recommendation: To reverse the worrying trends, the EU Forest Strategy must promote more resilient, functioning forest ecosystems by 2030, which can be attained through two strong interlinked elements:

- ***15% of the EU's forests need strict protection, including the immediate protection of primary and old-growth forests, with the concept of increased core protected areas surrounded by appropriate buffers that provide functional connectivity;***
- ***semi-natural forests under extractive forest management must have more biodiversity-friendly management practices delivering higher climate mitigation benefits.***

4.2. Reducing our impact on forests outside protected areas

The resilience of forests must also be improved outside the protected areas. This should aim to maintain production of forest biomass, but reduce harvesting intensity and changing management practices. Closer-to-nature forestry practice eg. Continuous Cover Forestry, should be followed with the consideration of reducing the negative impact of machinery, which can damage both soil⁵⁰ and trees left after harvesting.

The European Parliament has called on the EU and its Member States to increase the ambition in their actions to meet existing international and national commitments and address the urgency of deforestation and forest degradation worldwide. The connection between forest-based value chains and the sustainable development goals should form part of the EU's action to reduce its impact on the world's (including the EU) forests.

In relation to forest products, this means prioritizing more recycling of old wood-products over timber harvesting. While tree plantations that are managed to produce commodity wood can play an important role to decrease the pressure on natural forests, they should

⁴⁴ <https://www.coe.int/en/web/landscape>

⁴⁵ <https://ec.europa.eu/jrc/en/news/more-half-europe-s-forests-vulnerable-climate-related-hazards-study-finds>

⁴⁶ <https://www.cbd.int/protected/pacbd/>

⁴⁷ <https://www.iucn.org/theme/protected-areas/about>

⁴⁸ Moomaw et al 2019 <https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full>

⁴⁹ <https://www.sciencedirect.com/science/article/pii/S0378112713003824>

⁵⁰ <https://core.ac.uk/download/pdf/188040503.pdf>

wherever possible be re-naturalized through, for instance, increasing the number of old trees, the amount of deadwood and species diversity. This will also help improve their resilience to disturbances such as pest outbreaks.

As a response to the EU's climate and biodiversity commitments, the rotation length in forests managed for commodity production should be increased to store more carbon and to enable development of ecosystem processes. The recent Greenpeace study suggests that EU forests could absorb twice as much CO₂ than currently⁵¹. These activities will help degraded forests to recover, mature over time and eventually contribute to both the EU Biodiversity Strategy for 2030 and Climate Target.

Finally, the EU Forest Strategy must address the issue of leakage, that is, the risk that increased protection of EU forests and lower harvest rates may cause increased harvesting in other parts of the world.

Recommendation: The new EU Forest Strategy must promote management practices that recognise strict protection with non-intervention also as a forest management choice delivering multiple benefits.

4.3. Afforestation and reforestation

With reference on the UN Decade on Ecosystem Restoration⁵², afforestation in the EU should contribute to increasing ecological connectivity between strictly protected areas and improving landscape scale resilience. Integrated climate and biodiversity actions are fostered through Connectivity Conservation – a superior approach to restoration that integrates climate mitigation, adaptation and biodiversity outcomes.

The biodiversity strategy suggests that “(a)fforestation, reforestation and tree planting to support biodiversity and ecosystem restoration will be promoted through the CAP Strategic Plans, and the Cohesion Policy funds.” The communication proposes that these activities are to be biodiversity friendly. Afforestation must promote planting of mixed native species, not monoculture plantations, as well as consider whether the area should be returned to a non-forest natural ecosystem.

Reforestation, including after clear cutting, should focus on re-establishing ecosystem integrity by looking to restore natural forests conditions, rather than prioritising re-establishing semi-natural forests⁵³ or tree plantations with a view to future clear-cutting and commodity harvesting. This approach to reforestation will need to address or minimise pressures that prevent natural forest conditions being restored e.g. invasive species, planting of non-native trees and changes in natural hydrology.

Ecological principles are key in afforestation and reforestation, but these activities must also respect local cultural histories and human rights, the need to conserve a range of ecosystem types, and the need for land use management to supply food and fibre.

Recommendation: Afforestation and reforestation must emphasise increasing/restoring connectivity between fragments of older and maturing forests,

⁵¹ https://www.greenpeace.org/static/planet4-eu-unit-stateless/dc958adf-20201203_greenpeace_future_of_forests_in_the_eu.pdf

⁵² <https://www.decadeonrestoration.org>

⁵³ <http://www.fao.org/3/y4171e/Y4171E47.htm>

and reducing the edge effect in fragments (e.g. improving the shape of patches, thus the ecosystem integrity).

4.4. Developing the full array of a forest-based economy

The Commission Staff Working document entitled ‘Blueprint for the EU forest-based industries’⁵⁴ defines various industries that employ 3,5 million people across the EU. Unfortunately, this document has a serious limitation: it only recognised those industries whose activities are based on timber harvesting and wood products. This approach is flawed, because it considers only the provisioning service of wood supply provided by forests and ignores the many other benefits/ecosystem services from forests.

Following the draft CBD post-2020 global biodiversity framework, the EU Biodiversity Strategy also calls for the expansion of nature conservation areas to cover 30% of the EU terrestrial areas. Critics have concerns about whether or not this expansion will cause economic losses to the forestry sector. However, these critical voices do not consider that protected areas also generate economic benefits making them an “economic” sector on their own.

The recent Waldron et al 2020 report⁵⁵ about the economic implications of such an expansion found “that protecting at least 30% of the world’s land and ocean provides greater benefits than the status quo, both in terms of financial outcomes and non-monetary measures like ecosystem services”⁵⁶. The report suggested that preserving nature should become a centre element of economic development strategies and policies should offer business incentives for protection.

For instance, nature-based tourism and engagement in nature conservation could provide an alternative sector for those who might be impacted through increasing protection. A recent analysis by the Ministry of Environment in Slovakia⁵⁷ found that, if redundancies were made gradually and mainly at the expense of workers of retirement age, only 155 jobs are at risk from increasing the non-intervention area in national parks up to 75%. On the other hand, the report acknowledged the expectation of creating new jobs in tourism and nature conservation. The EU Green Deal is a unique opportunity to develop a truly broad-based forest economy derived from a range of ecosystem services and functions of forests; not only a timber-based economic model that does not reflect the reality of forests and their benefits.

As well as containing an irreplaceable natural heritage for Europe’s biodiversity and landscapes, forest areas can offer substantial economic benefits – for local communities, landholders and society in general. Economic benefits can be derived in two main forms: direct markets returns and payments for ecosystem services.

Direct market returns are already being gained by nature tourism in wild areas that contribute substantially to local economies, particularly in remoter rural areas where

⁵⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013SC0343>

⁵⁵ https://www.conservation.cam.ac.uk/files/waldron_report_30_by_30_publish.pdf

⁵⁶

<https://static1.squarespace.com/static/5c77fa240b77bd5a7ff401e5/t/5f05c366f5edb16b875b3964/1594213260537/Waldron+Report-Highlights.pdf>

⁵⁷ https://www.minzp.sk/files/iep/kolko_stoji_divocina.pdf

alternative sources of income and employment are relatively scarce. The 'multiplier' effect of income injections in the local economy can also be disproportionately strong in such areas.

This capacity to provide cost-effective returns from investment in protection and restoration is a key feature of the report on The Economics of Ecosystems and Biodiversity (TEEB), which identifies initiatives that deliver a high rate of return. A growing number of wild area projects are now being quantified on such a basis, which is intended to reinforce rather than substitute for more traditional values of biodiversity as an intrinsic benefit.

Payments for ecosystem services are based on creating markets through a decision-making process such as legislation. Payments can take many forms such as subsidies, investments, or direct payments. Such payments can provide additional sources of income for rural development.

An important consideration in assessing benefits from ecosystem services is determining whether provision of the services is complementary (that is, provision of one service does not affect provision of other services), or conflicting (that is, provision of one service reduces the capacity of the ecosystem to provide other services). Use of the ecosystem service of biomass provisioning, for wood, pulp or energy, conflicts with the provision of many other services, for example supply and filtration of water, erosion and flood control, habitat for biodiversity, amenity and recreation. Such scenarios have been demonstrated in a temperate forest case study where the value of the foregone ecosystem services that were reduced due wood production was 2 to 8 times greater (range depending on assumptions) than the value of the provision of wood⁵⁸.

Further work is required to ensure that benefits from wild areas are linked to payment systems that bring direct benefit to local communities and landholders, in return for enabling appropriate protection and restoration measures. An accounting system for quantifying and comparing all ecosystem services is needed to plan correctly where logging is most appropriate, and where the benefits of other services from maintaining a natural forest prevail over the benefits of wood production. Accounting for these ecosystem services should recognise that the costs of forest conservation/protection are often incurred at the local level, while benefits can accrue to others away from the forest of at national or global scales. Hence, PES schemes must ensure fair benefits sharing at the local level.

Recommendation: The EU Forest Strategy must establish the framework for utilising payments for ecosystem services as an alternative to the direct market values. Such a move will help to reward protection of carbon stocks in primary / old-growth forests, not only the gains from annual flows.

⁵⁸ Keith H., Vardon MV, Stein JA, Stein J, Lindenmayer D. 2017. Ecosystem accounts define explicit and spatial trade-offs for managing natural resources. *Nature Ecology and Evolution* 1: 1683-1692. <https://www.nature.com/articles/s41559-017-0309-1>

4.5. Creating a careful bioeconomy

In 2018, the European Commission published the updated EU Bioeconomy Strategy⁵⁹. The strategy “proposes actions to scale-up and deploy locally the bioeconomy, capitalising on and going beyond the previous successful R&I investments, in order to create growth and job opportunities at local levels, to reinforce the bio-based sector, contribute to the modernisation of EU industry, to protect the environment and enhance ecosystems’ functions and biodiversity”. The document includes five goals, which include limiting and adapting to climate change, strengthening the EU’s competitiveness and creating jobs.

The strategy also proposes to utilise biomass for energy, which is currently the largest part of the renewable energy mix in Europe. However, recent evidence^{60,61} suggests that harvesting of forests for biomass burning must be reduced, because it still represents a net addition of CO₂ to the atmosphere and reduces the capacity of forests to remove CO₂, even if harvested on a sustainable production rotation, and the resulting impact lasts decades to centuries. The recent JRC report on woody biomass found only one out of 24 scenarios that delivers climate mitigation benefits without harming biodiversity⁶². It should be noted that “sustainable” forest management (maintaining harvest levels below growth levels), which is a valid concept for ensuring an ongoing supply of wood products, is not a proxy for, or a producer of, “carbon neutral” biomass fuels.

Additionally, the analysis of “sustainable” forest management ignores the foregone loss of carbon due to not allowing forests to continue growing to reach their carbon carrying capacity⁶³. There is a “narrative” stating that we need to harvest to maintain the uptake of carbon by forests since old forests emit as much as they take up. However, this equilibrium is not reached at all within the current age of trees used in rotation systems. It does not occur for several centuries into the future⁶⁴. In addition, some wood entering the EU common market is harvested illegally with no regard for managing for sustainable production. Occurrence of illegal harvesting is evident from the JRC EU Wood Resource Balance Report⁶⁵ (12,8% unaccounted wood sources in 2015) and the proposal from the Hungarian Competent Agency⁶⁶ indicates that EU Timber Regulation (EUTR) fails to stop illegal harvesting.

Improved forest protection helps create new job opportunities and develop the green economy, which must be acknowledged as part of the EU Bioeconomy Strategy. In rural areas, jobs can be based on services linked to protection such as law enforcement, research, monitoring, recreation, domestic and international tourism, education and interpretation.

⁵⁹ <https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478>

⁶⁰

https://easac.eu/fileadmin/PDF_s/reports_statements/Carbon_Neutrality/EASAC_commentary_on_Carbon_Neutrality_15_June_2018.pdf

⁶¹ <http://eubiomasscase.org/wp-content/uploads/2020/07/RED-II-biomass-Paper-Tiger-July-6-2020.pdf>

⁶² https://publications.jrc.ec.europa.eu/repository/bitstream/JRC122719/jrc-forest-bioenergy-study-2021-final_online.pdf

⁶³ Keith et al 2009 <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2486.2009.02146.x>

⁶⁴ Luyssaert et al. 2008 (Science 455: doi:10.1038/nature07276)

⁶⁵ https://knowledge4policy.ec.europa.eu/publication/wood-resource-balances_en

⁶⁶ <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=14938>

Recommendation: The EU Forest Strategy must enforce legalising the MSs' wood resource balances and guarantee that the bioeconomy is not measured by the volume of timber used in Europe but by the higher added value of the products. This will contribute to securing more jobs, while protecting more forests.

4.6. Guiding principles for improved forest management

With reference to the above priorities, we suggest that the EU Forest Strategy adopting guiding principles, which focus on the recovery of forests and the ecological infrastructure they provide for the common benefit of society. The foundational question should be 'What will help ensure that forests, including primary forests, are strengthened to endure against the impacts of global change and exploitation?' We suggest the answer is management and policies that embody the following guiding principles that will maximise forest ecosystem integrity:

1. The forests' composition, structure and function, including its abundance of biodiversity, should be maintained close to its natural state in order to ensure its climate mitigation benefits and adaptive capacity.
2. Forests close to their natural state benefit the whole society and guarantee resilience and capacity for adaptation, which are needed to meet the needs of future generations.
 - a. The diversity of species and structural characteristics of natural forests is a result of evolutionary processes that have resulted in functional and resilient forest ecosystems.
 - b. Deadwood is an important element of natural forests for habitat, nutrient cycling, and carbon storage.
 - c. Natural disturbances, including fire, beetles, landslides etc, are part of ecosystem dynamics that maintain ecosystem integrity over the long-term, while human-induced and climate change related disturbances lead to ecosystem degradation.
 - d. Natural forests provide significant climate mitigation through their long-term carbon storage, low risk of loss, and continuing sequestration. While harvested forest biomass does store some carbon, its production leads to a carbon debt, at least for the critical period in the next few decades.
3. All types of timber harvesting risk degrading natural forest habitats. Even "sustainable" or "close to nature" forestry has a negative impact on forest ecosystem integrity and the multitude of ecosystem services they provide.
4. Forest management needs to consider the full range of ecosystem service benefits to people including e.g. regulating water supply, water and air filtration, nature-based recreation, habitat for pollinating species, cultural identity as well as carbon storage.
5. Tree plantations (regardless if based on exotic tree species or genetically homogenous native tree species) with a primary purpose to produce forest biomass should not be regarded as forests, but agricultural crops or tree farms.

6. Sustainable management of forests is to be recognised as a way to aim at sustainable production of yield, which limits other sustainability elements and while leading to degradation of primary forests clearly targets delivering only forest biomass
7. The monitoring of the conservation and ecosystem services values of our forests must be improved in each biogeographical region. We must assess the distance of each management unit to its potential natural status. This would correspond to the maximum values (e.g. carbon stocks and biodiversity) found in natural forests in similar ecoregions. The status of each category of forest can be compared and the distance between them for specific characteristics (e.g. maximum tree size, biomass) assessed, as well as relating forest categories to a desirable condition. Such assessments will help calibrating/promoting local best management approaches (e.g. encouraging the shift from coppice to high forest). It would avoid emphasizing “small improvements” that emerge when degraded forests become “less-degraded” (which is desirable, indeed, but still quite far from an ideal change in practices) in areas where forests have been largely impoverished by overexploitation.

5. Financing forest recovery

The European Commission and the Member States through recognising the shared competence over forests will have to work in close cooperation to implement the forest strategy. The involvement of all relevant stakeholders, beyond those sectors benefiting simply from the provisioning of forest biomass, must be involved in this implementation.

Appropriate funding should be allocated for the implementation of this strategy from EU, national and potentially private sources. Funding the new EU forest strategy will be a profitable investment!

Metsähallitus, the Finnish Forestry and Park Service, found that “National Parks Return 10 Euros to the Finnish Economy for Every Euro Invested by the Finnish Taxpayer”⁶⁷, which is a strong argument for the economic benefits of protection. Waldron et al (2020) found that “economic benefits of protecting 30% of Planet’s land and ocean outweigh the costs at least 5-to-1”⁶⁸.

Both the EU (including the Multi annual Financial Framework and the NextGenerationEU) and national level financial schemes might provide an excellent funding source, if proper safeguards and incentives are built in.

Flourishing local communities are important for the EU. Many rural communities have a strong emotional, cultural, social and economic linkage to forests. However, the success of providing sustainable development scenarios to these local communities will depend on climate resilient development pathways⁶⁹. Coupled with traditional practices, multiple

⁶⁷ <https://www.metsa.fi/en/economic-benefits-of-national-parks/>

⁶⁸ <https://www.campaignfornature.org/protecting-30-of-the-planet-for-nature-economic-analysis>

⁶⁹ Barber, C.V., R. Petersen, V. Young, B. Mackey, C. Kormos. 2020. The Nexus Report: Nature Based Solutions to the Biodiversity and Climate Crisis. F20 Foundations, Campaign for Nature and SEE Foundation.

forest value chains can be secured through nature-based tourism and payments for ecosystem services.

There is a fear of job losses resulting from forest protection, but this is a false linkage between the impact of increasing the area of protected areas and job losses. For instance, 50% of forestry related jobs were lost in Sweden between 1976 and 2016⁷⁰, which was linked to technological advancement and not the increase in area of forest protection. According to SoEF (Forest Europe 2020) employment in the forest sector is steadily declining by about 33% from 2000 to 2015 while the forest area increases and timber harvesting increasing by 9% in the same period in the EU 27⁷¹.

The suggested afforestation and reforestation along with improved protection and restoration in the EU Biodiversity Strategy for 2030 offer a unique opportunity to involve the surrounding local communities in restoring the naturalness of our forests. Importantly, large scale, ecologically-based restoration and regenerative initiatives are not only important for the local economy, but also offer climate mitigation benefits to the broader society, both in terms of the potential quantum of carbon sequestration and the stability and longevity of carbon storage.

A comprehensive accounting system to value the full array of ecosystem services of forests must be adopted on an EU level⁷². The System of Environmental-Economic Accounting Ecosystem Accounting, which was recently adopted by the UN Statistical Division⁷³, offers a framework for such a new system that will allow a change in how our forests are valued.

6. Final remarks

The UNFCCC COP 25 in Madrid called for integrated action to prevent biodiversity loss and climate change, a sign that the world is increasingly looking for integrated solutions to the biodiversity and climate crises. Developing integrated climate and biodiversity solutions is as important for Europe as it is for developing countries. Allowing and encouraging European forests to reach their biological potential would make an enormous difference to tackling both crises.

Strict protection of natural forests, proforestation and less logging pressure on forests in the EU (and beyond) will provide integrated benefits for:

- playing a meaningful role in achieving the “net carbon neutral” policy by 2050, because forests continue to store carbon and when trees are allowed to keep growing they increase their carbon storage (and decrease emissions due to degradation in the land sector);

⁷⁰ <https://www.skogsstyrelsen.se/en/statistics/subject-areas/forestry-labour-force/>

⁷¹ EUROSTAT Roundwood removals by type of wood and assortment

⁷² Keith H. et al (2021) Evaluating nature-based solutions for climate mitigation and conservation requires comprehensive carbon accounting. *Science of the Total Environment* 769:144341

⁷³ [https://seea.un.org/ecosystem-accounting#:~:text=The%20SEEA%20Ecosystem%20Accounting%20\(SEEA,economic%20and%20other%20human%20activity.](https://seea.un.org/ecosystem-accounting#:~:text=The%20SEEA%20Ecosystem%20Accounting%20(SEEA,economic%20and%20other%20human%20activity.)

- contributing to reversing the biodiversity crisis through better planning of afforestation, reforestation and rewilding projects to create bigger core areas with appropriate buffers and guaranteed connectivity.

The EU Forest Strategy can help to put forests and the wider range of beneficiaries from the ecosystem services provided by forests into the centre of implementing the EU Green Deal.

Future generations will have to face the impacts of the climate change and biodiversity loss that are already locked in due to past human activities, but a paradigm shift in understanding and managing our forests, leading to this recommended new policy framework with clear identification of priority actions, will transform European forests to gain the greatest benefits for nature and society.

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Annex

The classification of ecosystem services based on UN SEEA

See as a separate document extracted from System of Environmental-Economic Accounting—Ecosystem Accounting: Final Draft, Version 5 February 2021 (pages 138-141)