

Better policies and management for sustainability transformations: How can expectations for forests be met?

Introduction | Our use of forests has profound implications for halting biodiversity loss, regulating climate, sequestering and storing carbon, and improving resilience against droughts, storms, pest outbreaks and other risks. Forests also provide a wide variety of products and help replace fossil resources in the bio-based economy, and offer spaces for recreation. These multiple ecosystem services are discussed in several policies. However, policies rarely address the conflicts and links between these multiple demands. Rather, policies often primarily focus on prominent ecosystem services and are designed from specific interests, creating policy incoherence that renders policy targets unfeasible and even threatens the sustainability of forest ecosystems. In these policy recommendations, we raise key aspects in better addressing the multiple demands.

Summary

- ✓ Forests play an important role in climate change mitigation, with potential synergies with biodiversity conservation and the provision of other ecosystem services. However, prioritising climate change mitigation only through carbon sequestration may cause trade-offs with other objectives.
- ✓ Diversifying forest management will alleviate trade-offs between ecosystem services.
- ✓ Policy planning should incorporate a thorough and transparent analysis of interactions and trade-offs between different forest ecosystem services.
- ✓ The targets of the EU Biodiversity Strategy for 2030 can be achieved without major negative impacts on timber production.

Actions

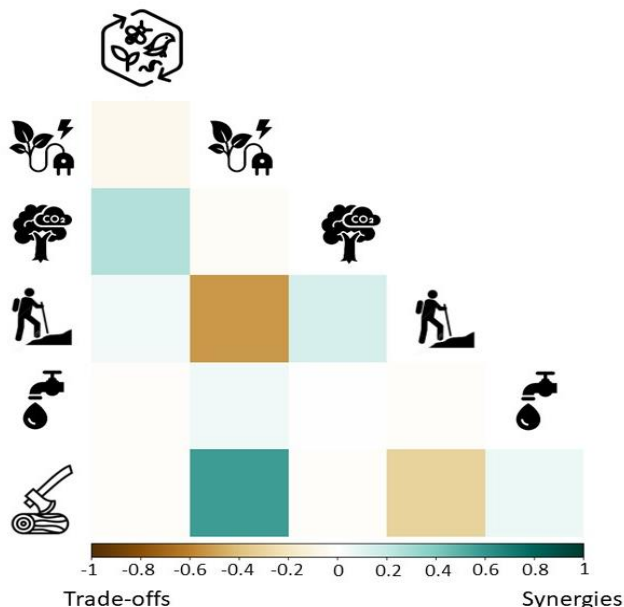
- ✓ Promote interaction across policy domains to improve policy coherence.
- ✓ Develop and implement ambitious biodiversity policies to secure ecosystem sustainability.
- ✓ Develop a strategy to guide diversification of forest managements to sustain multiple ecosystem services at the landscape level.

This policy brief is aimed at specialists, policy makers, professionals and the general public interested in the societal meanings, roles and functions of forests. At the time of grand sustainability challenges, we want to encourage constructive dialogue. We seek ways to consider the role of forests in providing multiple ecosystem services. Multi-disciplinary science can offer solutions that support long-term decision-making.



Recommendations | The following four recommendations support improving policy design in order to address multiple forest ecosystem services.

- i. **Policies should emphasise the interactions and balance the trade-offs among forest ecosystem services instead of narrowly focusing on prominent ecosystem services** | Forests are subject to multiple socio-ecological pressures and socio-economic needs. Disregarding trade-offs between policy objectives may cause unpredictability in policy implementation.

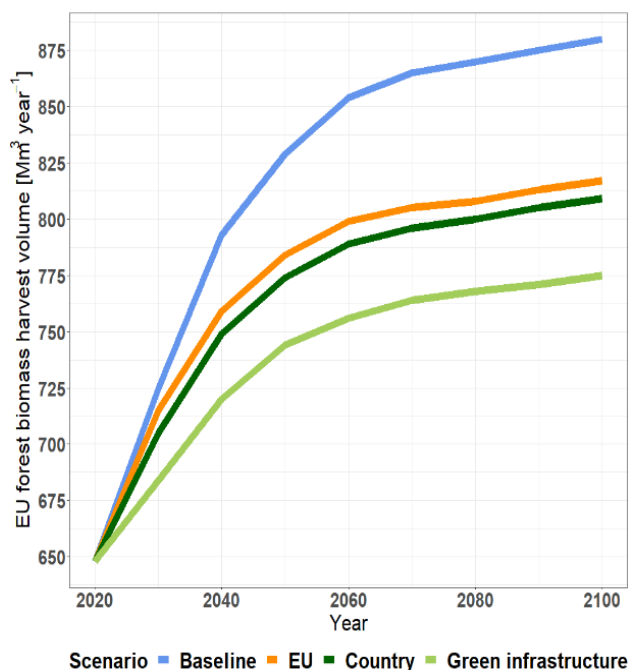


We show that the current estate of the forest at stand and landscape scales determine the potential future multifunctionality.

Figure 1. In Norway, management plans maximising forest multifunctionality improve the synergies between forest ecosystem services, such as bioenergy, wood provisioning and carbon mitigation. Other services, such as recreation, may become harder to achieve, as they conflict with ecosystem services that more likely to be promoted by active management and existing policy objectives.

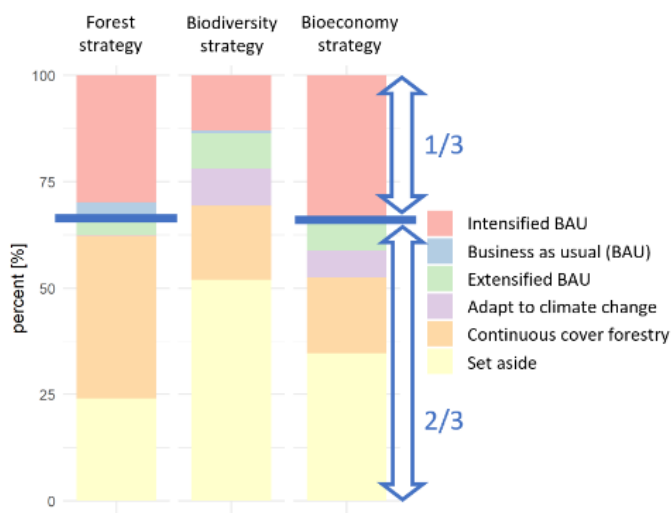
- ii. **The achievement of targets set in the EU Biodiversity Strategy for 2030 depends on the distribution of efforts across the member states** | To achieve the targets of the EU biodiversity strategy, we need to carefully consider whether the 10%/30% objective on strictly protected forests and closer to nature management is distributed across the whole EU, in each country, or at a local level. Our results show that sharing the EU Biodiversity Strategy objectives for 2030 equally among the countries or on a finer scale would allow reaching the objectives without major negative impacts on timber production in the EU and the rest of the world.

Figure 2. The EU Biodiversity Strategy for 2030 allows for an increase in forest biomass harvesting, regardless of possible variations in the implementation of increased protection area at the EU, country or green infrastructure scale. On an 80-year timescale, the biomass harvesting volumes can decrease by 7%-12% compared to a baseline development by implementing the biodiversity targets. However, it would still allow the EU to increase its current harvest levels.



- iii. **Diverse forest management will alleviate the trade-offs between forest ecosystem services** | Allocating the forest landscape into areas with specified management objectives can resolve conflicts among divergent policies. This requires a careful definition of landscape-level objectives in forest management planning to satisfy the requirement of land-use policies, as well as close collaboration with the landowners and societal stakeholders in the implementation.

Figure 3. In Finland, the optimal management solution for the Finnish forest policies requires considerable change in forest management. Current forestry is dominated by even-aged management (business as usual, BAU). At a minimum, 2/3 of the forest should instead be managed by practices including continuous cover forestry regimes and protected areas to meet the stated policy objectives.



- iv. **Forests play an important role in climate change mitigation, but their contribution should not be overemphasised** | Forests have several functions in mitigating climate change by sequestering carbon from the atmosphere, and storing carbon in trees and timber products while maintaining soil carbon stocks. However, overemphasising the role of forest and its resources (wood, bioenergy) in climate change mitigation can lead to conflicting expectations and negative long-term implications for other ecosystem services and biodiversity. We need to recognise the limits of using forest resources for achieving mitigation targets and societal decarbonisation.

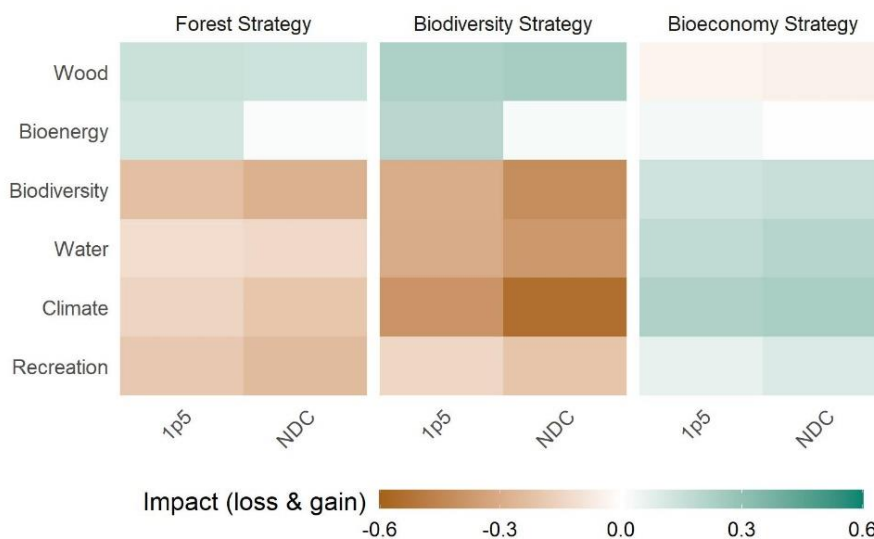


Figure 4. In Germany, prioritising EU climate change mitigation targets above national land-use policies has an impact on forest ecosystem services and biodiversity. There will be increases in wood and bioenergy but mostly decreases in biodiversity and other non-production services. **1p5 scenario** is based on the IPCC 1.5-degree target, translated into a Representative Concentration Pathway RCP1.9. **NDC scenario** (Nationally Determined Contribution) is linked to RCP4.5.

Country cases | MultiForest-project has conducted four country-specific case studies on how the current sectoral policies cause incoherences between diverse forest functions and how to improve the interaction between diverse policy goals.

Finland | **A considerable change in management is in order**

Forestry is currently dominated by even-aged management approaches, with clearcutting at the end of the rotation. The stated policy targets for the Finnish National Forest Strategy and the Bioeconomy Strategy require that approximately 2/3 of the forests would be managed by practices that include continuous cover forestry regimes and protected areas. To fully meet the Finnish Biodiversity Strategy targets would require 50% of forest protection area and a reduction in wood and bioenergy production.

Germany | **Reinstating forest multifunctionality as a policy aim**

Germany has a long history of forest multifunctionality by simultaneously acknowledging multiple forest uses and products. Forest multifunctionality has been recognised as a driver of stability and resilience, essential to ensure the persistence of forests and their contribution to society's demand for a long-term and sustainable provision of ecosystem services. Multifunctionality is achieved by diversifying forest management, not only at the stand level, but also over the landscape and territory.

Norway | **Forests becoming a key in climate mitigation policies**

In Norway, there is potential for increasing harvest for climate mitigation efforts. However, the achievement of these climate mitigation targets, represented by wood and biomass demands, will affect the provision of other ecosystems services and biodiversity conservation. These demands are also influenced by different policy strategies, causing a mismatch in proposed management solutions as well as synergies and trade-offs between forest ecosystem services.

Sweden | **Strategic coordination of forest policies is currently missing**

In Sweden, there is currently no explicit national level strategy to navigate diverse ecological, economic and societal developments and needs connected to forests. Therefore, policies coordinating the diverse aims, setting predictable future views and working on the boundaries of forests are required to make policy coordination more resilient and robust.



In the MultiForest project, we have developed novel approaches to evaluate the (in)coherence among forest policies in design and implementation. **First**, more rigorous policy targets on the international scale require consideration of forest-related demands on the national scale, especially in the era of bioeconomy and climate change. **Second**, tailored policy analyses identify conflicts between the incoherent forest policy objectives and show policy areas that require further coordination and harmonisation. **Third**, translating policy objectives into long-term scenarios provides lessons on how to combine different forest management approaches to avoid conflicts between divergent policy objectives in their implementation. **Finally**, the development of a common understanding and measure of forest multifunctionality helps to balance different forest ecosystem service demands and offers means for evaluating how far current policies are from an estimated maximum level of multifunctionality.

Publications

Eyvindson, K., et al., 2021. **High boreal forest multifunctionality requires continuous cover forestry as a dominant management.** Land Use Policy 100, 104918.

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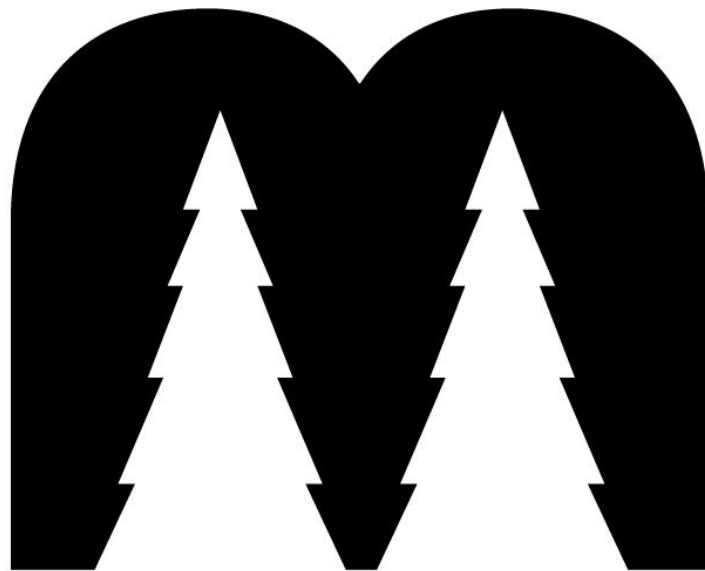
Lukkarinen, J., et al., forthcoming. **Forest policy coherence at the era of sustainability transitions.**

Pitzén, S., et al., forthcoming. **Coherent at face value: Integration of forest carbon targets in Finnish policy strategies.**

Torano-Caicoya, A., et al. forthcoming. **Policies impact on forest multifunctionality across Europe.**

More information: <https://www.jyu.fi/science/multiforest>

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