

# Forest characterization and opportunities

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#### Forest ownership in Europe















## **EU forest-related policies**

DG AGRI DG CLIMA DG ENER DG ENEV DG FISMA DG GROW

	1979					<sup>2023</sup> N
DG RTD DG SANTE INTERNATIONAL	Birds Directive Habitats Directive	Communication to protect and restore the world's forests	Transitional Regulation 2020 - 2022	Renewable Energy Directive (RED)	EU Industrial Strategy Public procurement	V
	Packaging Directive II	eforestation-free product Regulation	EU State Aid in the agricultural and forestry sector 2014-2020	ILUC Regulation	Blue print EU FBI	FOREST EUROPE
		FLEGT Action Plan	New EU Forest Strategy for 2030	2030 Climate and Energy framework	Guidance on cascading use of biomass	Bern convention (wildlife
	Water Framework Directive	Nature Restoration Law	New CAP 2023 - 2027 and State aids post 2020	RED II and RED III		and natural habitats)
	EU Timber Regulation	8th Environment Action Programme	EU Strategy on Adaptation to Climate change	Forest Productive Material Directive and Regulations		Aarhus convention (access to information and justice on
	Invasive Alien Species Regulation	Circular Economy Action Plan II	LULUCF Regulation and its review	Plant Protection Product Regulation		environment matters)
	Green Infrastructure	Plastic Strategy and Single Use Plastic Directive	Effort Sharing Regulation and review	Plant Health Regulation		Paris Agreement
	Strategy	Forest Focus Regulation	2050 long-term vision	EU Bioeconomy Strategy II		Roop Challenge
	for 2030	Sustainable Finance and its renewal		Horizon Europe		born challenge
	Soil Strategy	Taxonomy Regulation	Climate Law	Sustainable Carbon Cycle Initiative		
	Coll Hought Law	Delegated Act - Climate	Fit for 55 package	Certification on Carbon		
	Soll Health Law	Delegated Act - Biodiversity		Removals		



#### Forest sector is the only one, that can ensure *de facto* GHG sequestration!







#### Annual CO<sub>2</sub> removals in EU Forest Land



Figure 1: Annual CO2 Removals by Forest Land and Harvested Wood Products 1990-2020 in the EU (in Mt CO2/year, data from the 2022 EU submission to the UNFCCC).

Mauser H. 2022, EFI



(Hanewinkel et al., 2013; Nature Climate Change, 3(3), 203)





Gert-Jan Nabuurs, Peter Verweij, Michiel Van Eupen, Marta Pérez-Soba, Helga Pülzl and Kees Hendriks

## Forest protection: how to allocate?



Currently we are moving towards segregation of forest areas in Europe, and application of triada approach



Thus the selection of areas for each of the goals is crucial. The EU Biodiversity Strategy (2030) makes the preservation of Europe's old-growth forests one of its priorities.

*The identification of undocumented primary and old-growth forests in the field remains crucial (EK, 2021)* 



Figure 5. Likelihood of presence of primary and old-growth forests. Map at 250 m grid size implemented by Sabatini et al. (2020b) using a spatially explicit boosted regression trees model relating the presence of primary and old-growth forests and 15 biophysical, socio-economic and historical land use predictors. EU areas outside the domain of the map not included in the model.

Source: Sabatini et al. 2020

**Muys** et al. 2022. Forest Biodiversity in Europe. From Science to Policy 13. European Forest Institute. https://doi.org/10.36333/fs13

#### Forest resources in EU and Latvia

1.7



Forest resources have increased in the EU in the past seven decades (forest area +37%, growing stock +138%), while globally forest area and growing stock is decreasing.









limiting factors for forest carbon:

a) natural disturbances;

b) specific ecosystem potential to store carbon;

c) forest management

Nabuurs et al., 2013

## C potential



 Area expansion (afforestation) – comparatively less potential for Nordic – Baltic region due to already high forest cover (50% plus)

Typical approaches for maximizing carbon in current forest area includes both storing carbon in living trees by e.g.

- longer rotation periods (maximize carbon storage)
- enhance CO<sub>2</sub> sequestration by quicker forest growing cycles by e.g. shorter rotation periods (maximize CO<sub>2</sub> sequestration).



### Carbon stock in old-growth forests: Europe







Gundersen P., Thybring E.E., Nord-Larsen T. *et al.* (2021) Old-growth forest carbon sinks overestimated. *Nature*, 591, E21–E23. https://doi.org/10.1038/s41586-021-03266-z





#### Carbon stock in old-growth forests: Latvia



- Significant empirical data amount gathered in Latvia (188 old-growth forests, 1128 sample plots) about old-growth forests
- ✓ In these stands old trees are still dominant forest element (coniferous average age 180 years, deciduous 120 years)
- No signs and data about forest management in these stands for the past 40 years

### Ecosystem carbon potential



Odum's hypothesis



#### limiting factors for forest carbon:

- a) natural disturbances;
- b) specific ecosystem potential to store carbon;
- c) forest management

Gundersen P., Thybring E.E., Nord-Larsen T. et al. (2021) Old-growth forest carbon sinks overestimated. Nature, 591, E21–E23. <u>https://doi.org/10.1038/s41586-021-03266-z</u>





Largest increase form mature to oldgrowth stands is in the **tree biomass (20-40%) and deadwood (20-38%)** – in the significant carbon pools with more than 50% of the carbon stored

> <u>Published – Kenina et al.</u> Forests, 10, 911; doi:10.3390/f10100911 Forests, 9(7), 435; doi: 10.3390/f9070435<sup>16</sup>





Annual carbon accumulated is significantly lower in old-grwth forests: Aspen: -13 % Birch: -23 % Pine: -29 % Spruce: -45 %

# Climate change mitigation potential





#### Verkerk et al., 2022



Mitigation potential (Mt CO,eq yr¹)

Forest-based mitigation potential by 2050 in the EU-27, NO, CH and UK by activity type. The data sample size (number of studies; number of datapoints) displayed next to activity type. Bars = the mean values across all literature reviewed. Error bars = minimum and maximum values of the range limiting factors for forest carbon:

a) natural disturbances;

b) specific ecosystem potential to store carbon;

c) forest management

## Practical examples





- "Doing nothing" is not always the best option;
- ✓ Slovenia's case where clear-cut forestry is prohibited, leads to increased share of salvage logging;
- ✓ Unified understanding and definitions of forest management practices e.g. clear-cut

# Possible ways to enhance carbon in European forestry



 Area expansion (afforestation) – comparatively less potential for Nordic – Baltic region due to already high forest cover (50% plus)

#### The same forest area,

#### but different quality, different vitality!

#### = more carbon

- ✓ Productivity of existing forest stands (climate smart management to maximize carbon sequestration and storage in living tree biomass)
- ✓ Preventing carbon loss (resilience to natural disturbances)
- ✓ Wood products (substitution effect)



# Thank you for the attention!

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