

Transition to alternative forest managements in EU28: compensation costs, leakage effects and implications to forest sector

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- Research question: Investigate transition to alternative forest managements (AFM) in EU28 [production (PFM), multifunctional (MFM), set-aside (SFM)]. Study is a part of ALTERFOR project, which considers alternative forest managements in EU28 (<https://alterfor-project.eu/>).
- Method: Biophysical data from 10 case study areas upscaled to EU28 level and implemented to global land-use model (GLOBIOM). Force different AFM transition paths. Compensation to forest owners = shadow-price of AFM forcing constraint (payments to ecosystem services=opportunity costs).
- Results: 1) Forest owners choose PFM voluntary, but not MFM or SFM (payments up to 50 €/ha/yr to MFM and 250 €/ha/yr for SFM needed)
2) Leakage effects on harvest volumes low for MFM, but high for SFM
3) From economic perspective MFM better option to provide other ecosystem services in EU28 than SFM (or combination of SFM and PFM)

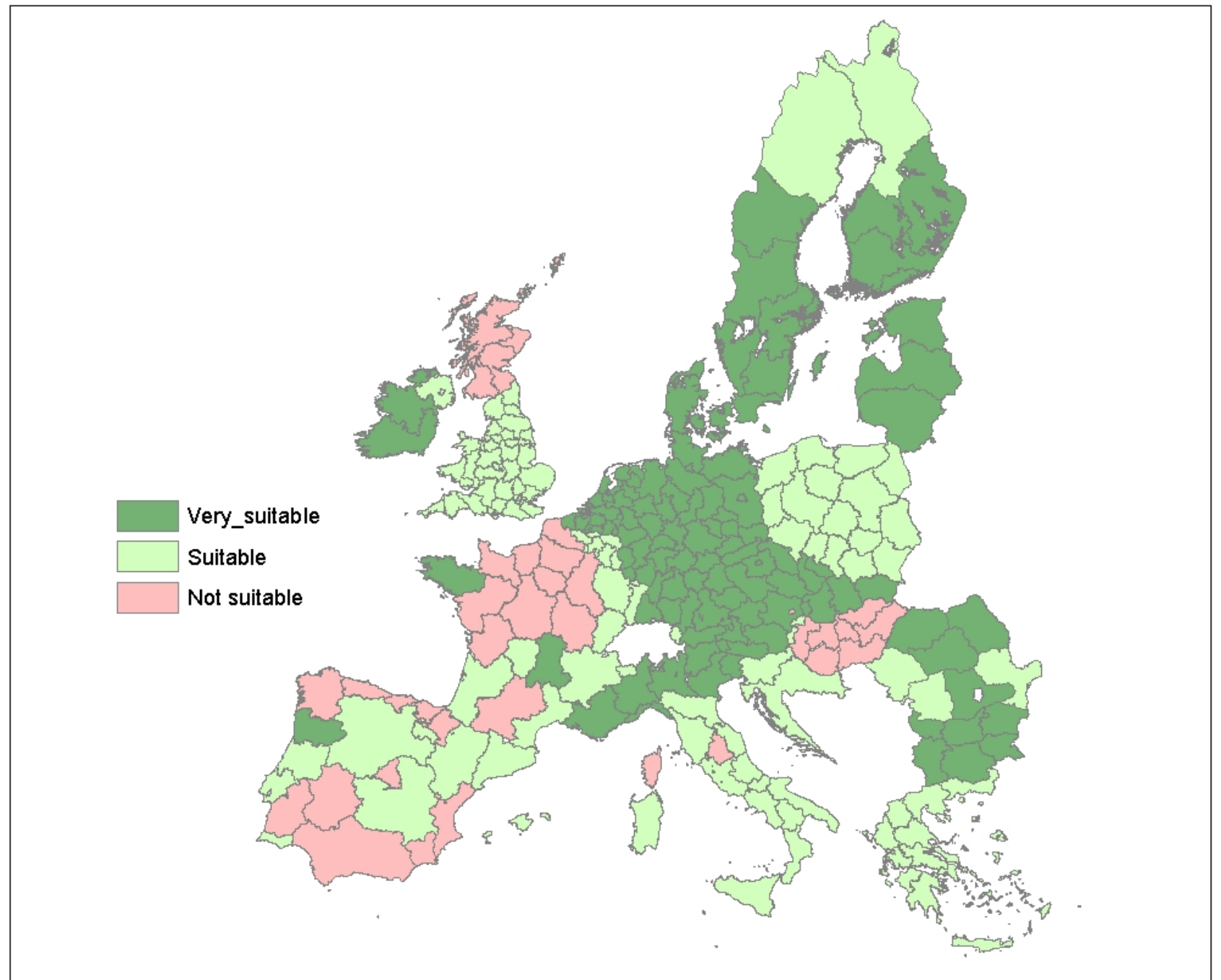
Forest Management representation in GLOBIOM

- Current managements (unmanaged, current low, current high)
- Alternative forest managements (PFM,MFM, SFM)
- Scenarios : baseline, AFMfree, MFM25-100, SFM25-100

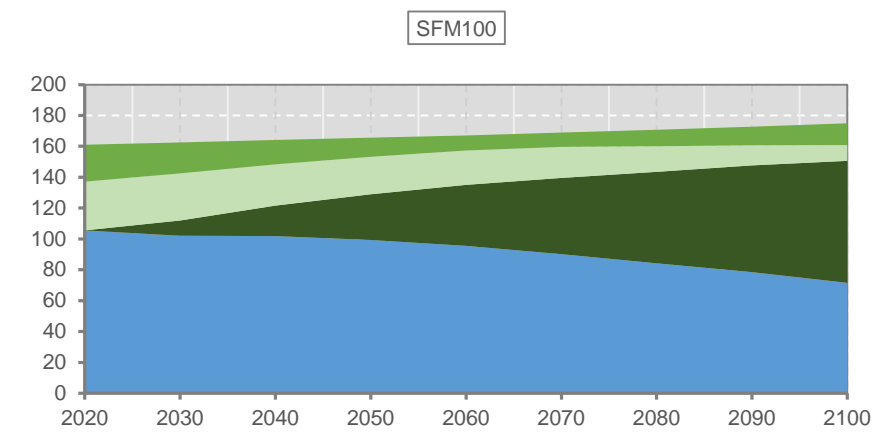
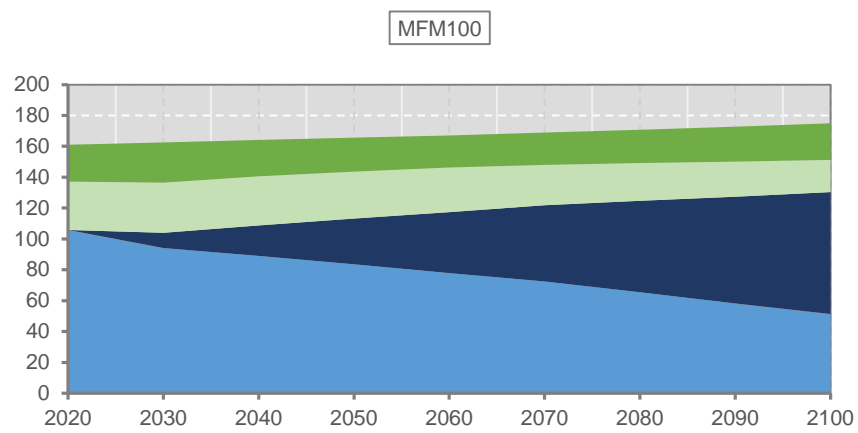
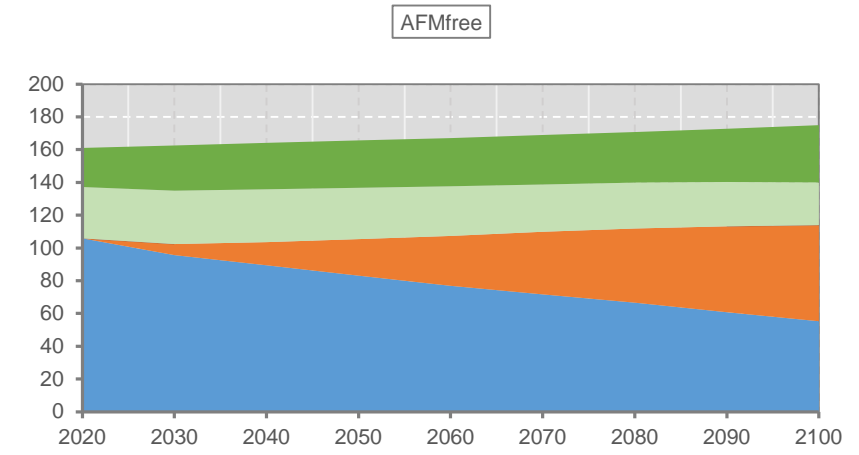
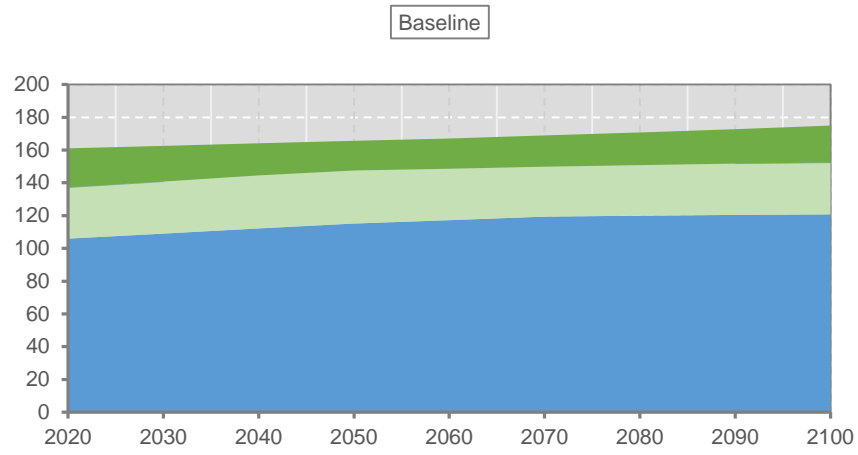
Alternative Forest Management (ALTERFOR based)	Available roundwood (compared to current)	Available logging residues (compared to current)	Non-coniferous share (compared to current)
PFM (Productive Forest Management)	1.18-1.22	1	0.58-0.91
MFM (Multifunctional Forest Management)	0.86-0.97	0.5	1.02-1.56
SFM (Set-Aside Forest Management)	0	0	1

Suitable AFM area based on forest similarities at NUTS2

- Suitable area: 79 Mha
- Total EU28 forest area:
161 Mha



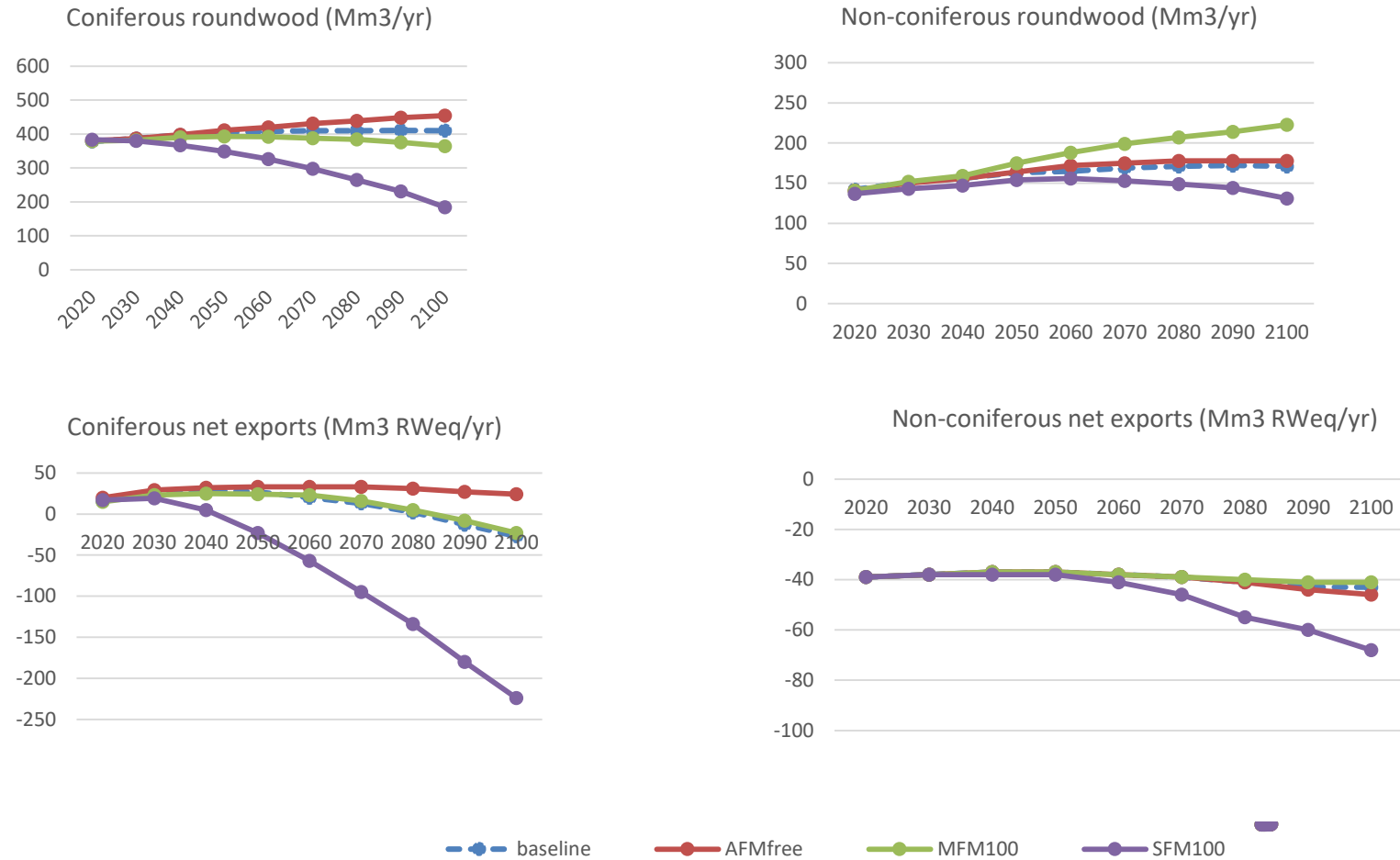
EU28 forest area development 2020-2100



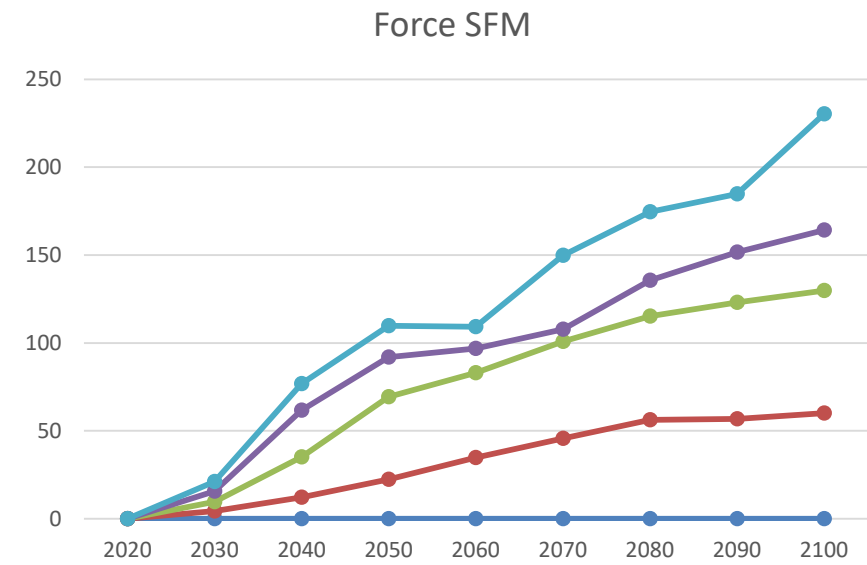
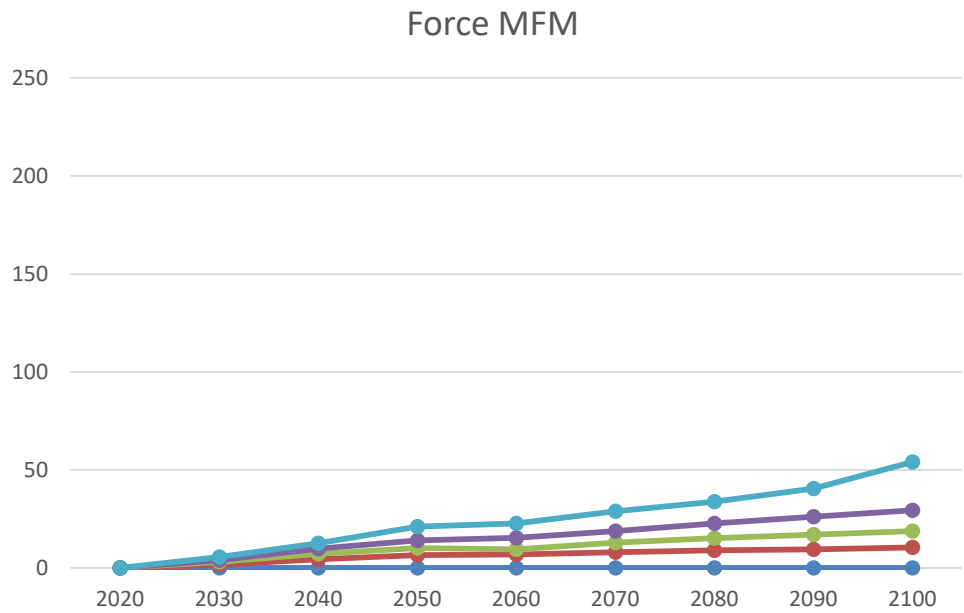
■ Unmanaged forests
■ Current high intensity management
■ MFM

■ Current low_intensity management
■ PFM
■ SFM

EU28 harvest volumes and net exports



EU28 average payments for AFM €/ha/yr



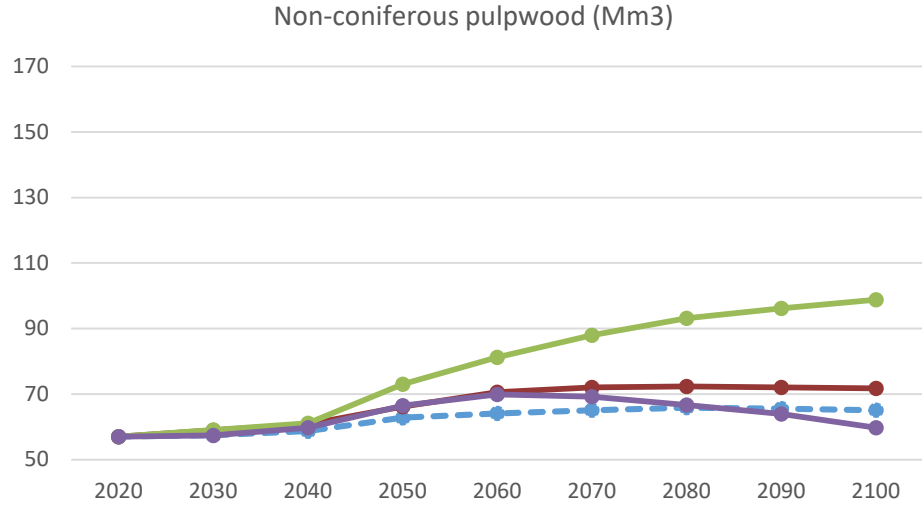
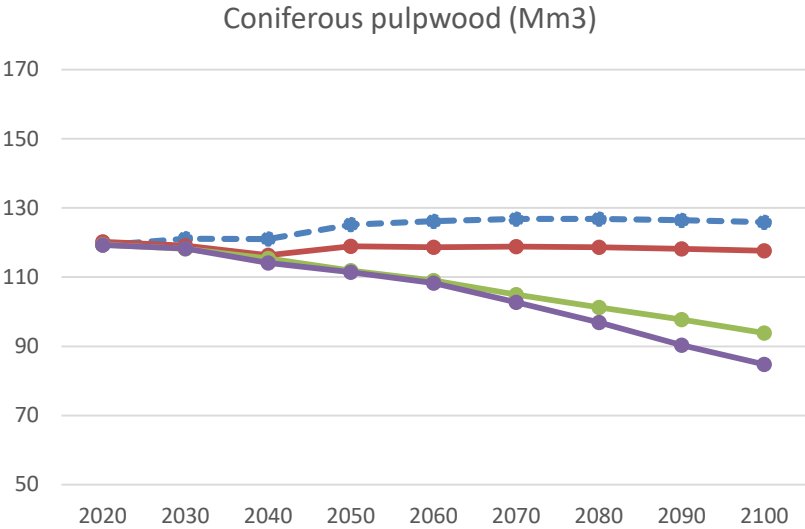
AFM0 MFM/SFM25 MFM/SFM50 MFM/SFM75 MFM/SFM100

Leakage effect on harvests

Change of roundwood harvests (Mm3) relative to baseline

RCPref									
	AFMfree	MFM25	MFM50	MFM75	MFM100	SFM25	SFM50	SFM75	SFM100
EU28	51	39	25	12	-10	-24	-45	-138	-266
ROW	-37	-27	-18	-10	8	12	23	87	159
World	14	12	7	2	-2	-12	-22	-51	-107
Leakage rate	-73%	-69%	-73%	-81%	-84%	50%	51%	63%	60%

Substitution C/NC pulpwood use in EU28



baseline

AFMfree

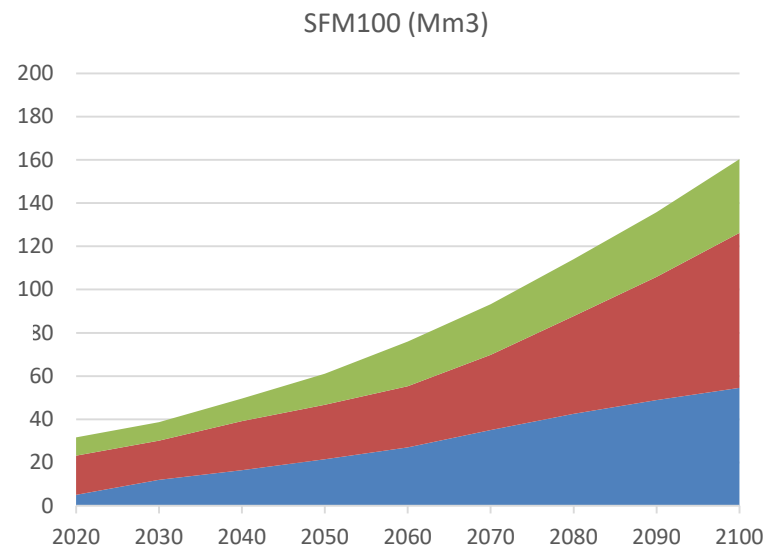
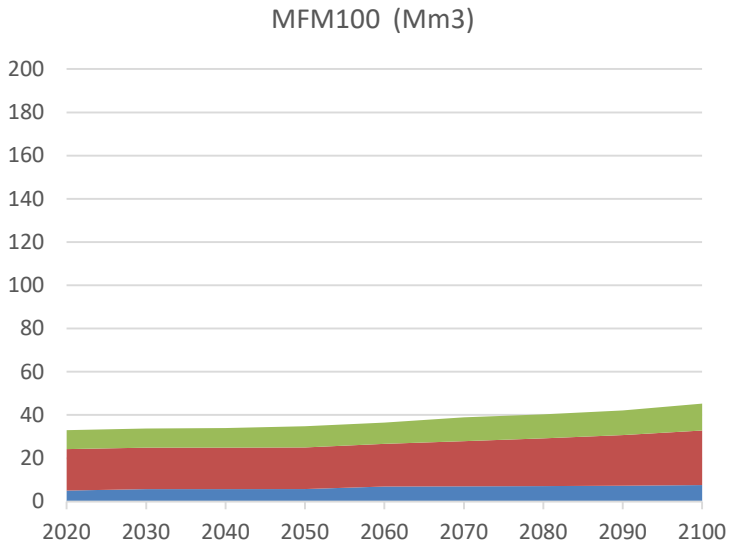
MFM100

SFM100

Conclusions

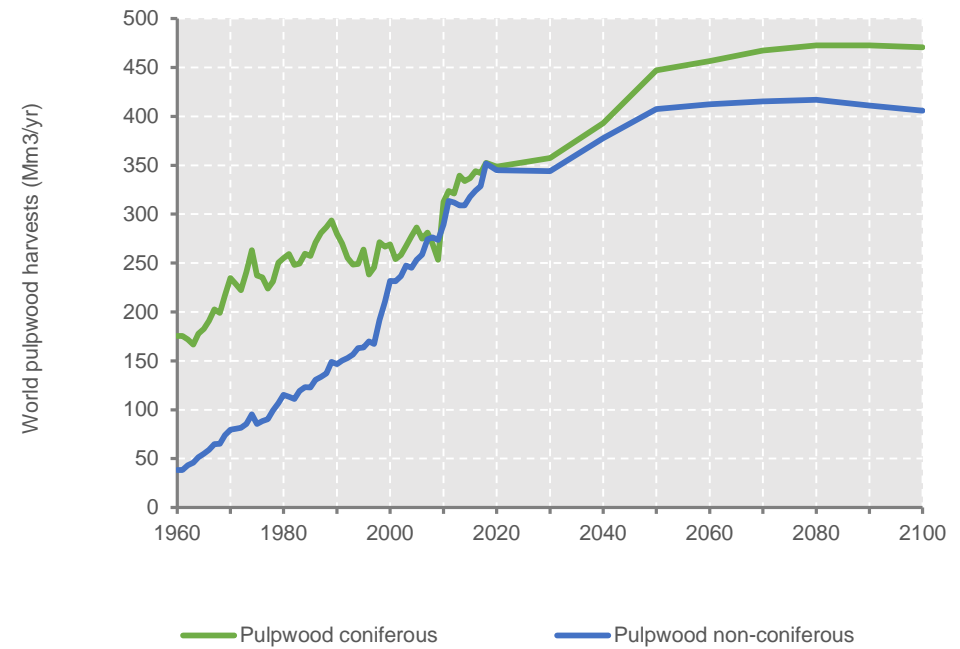
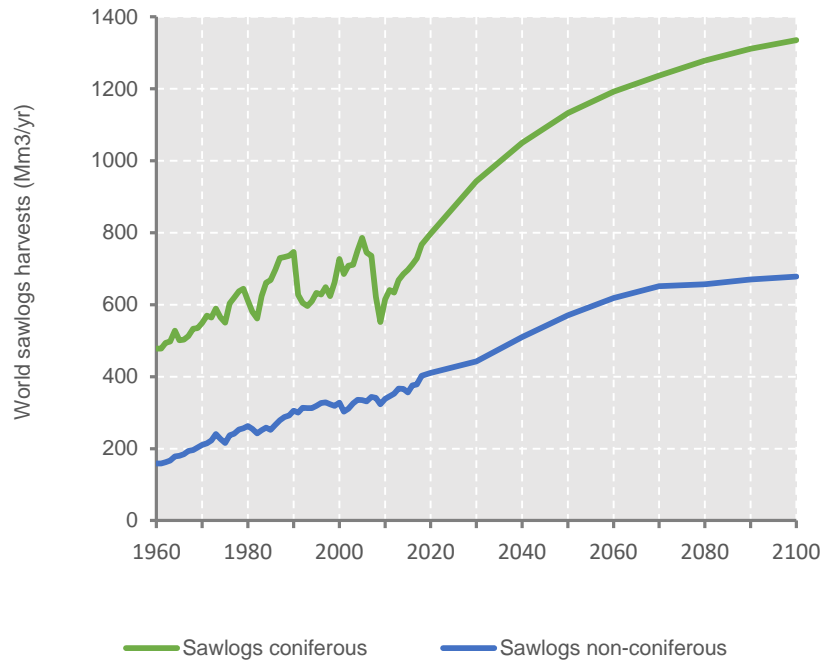
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(payments up to 50 €/ha/yr to MFM and 250 €/ha/yr for SFM needed)
- 2) Leakage effects on harvest volumes low for MFM, but high for SFM
- 3) From economic perspective MFM better option to provide other ecosystem services in EU28 than SFM (or combination of SFM and PFM)
- 4) Limitations of analysis: i) ALTERFOR biophysical data
ii) opportunity costs approach to evaluate payments to ecosystem services

EU28 roundwood and woodchips import

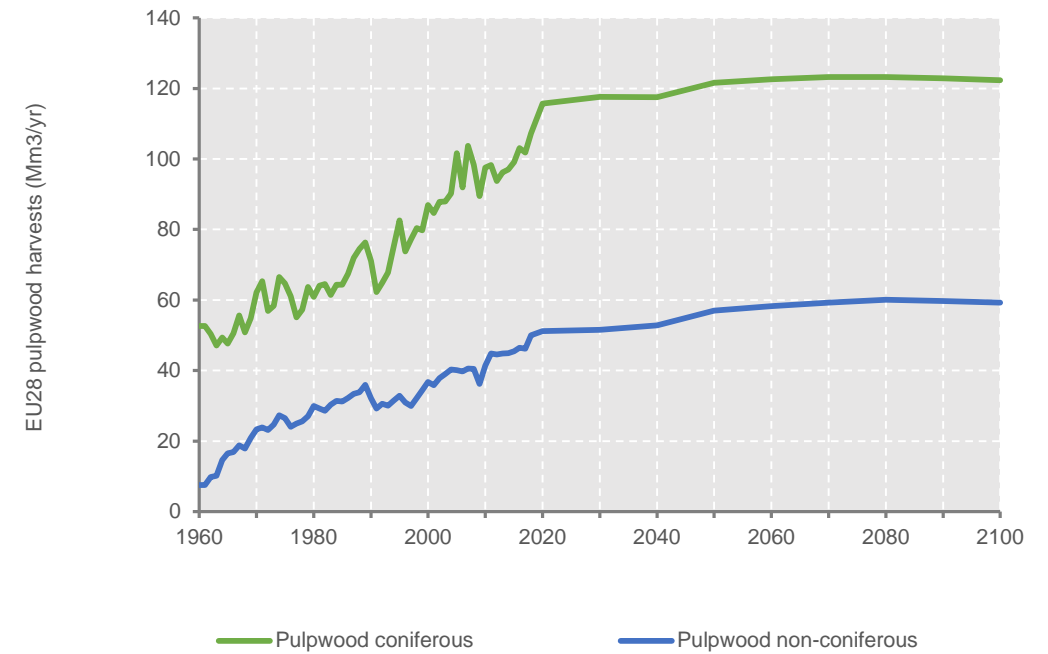
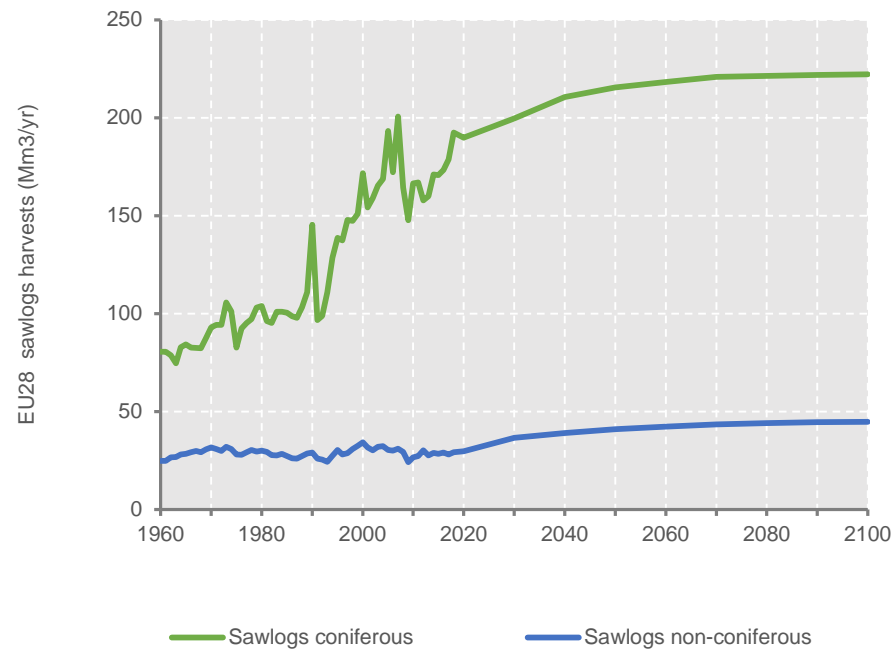


■ Tropical_zone ■ Boreal_zone ■ Temperate_zone

World sawlogs and pulpwood harvests (baseline)

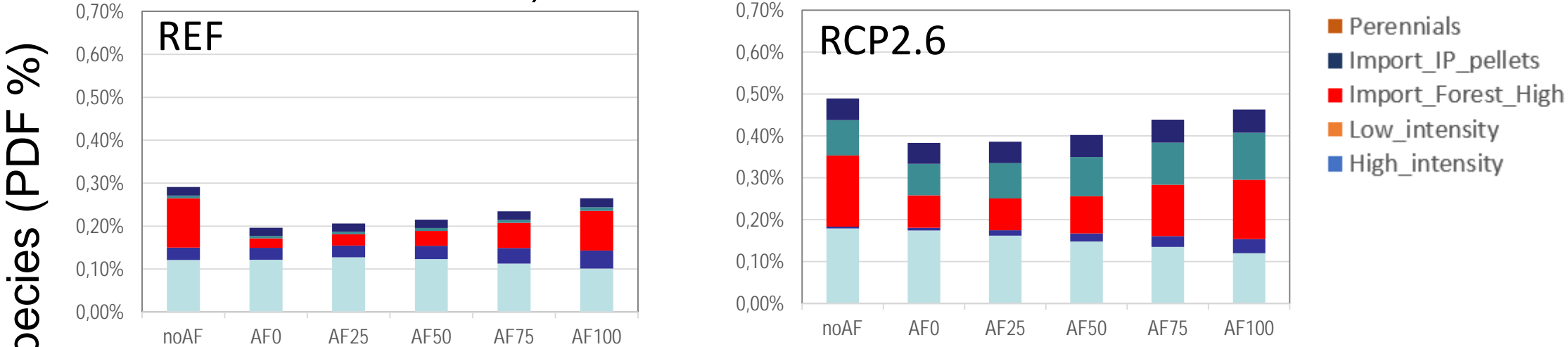


EU28 sawlogs and pulpwood harvests (baseline)

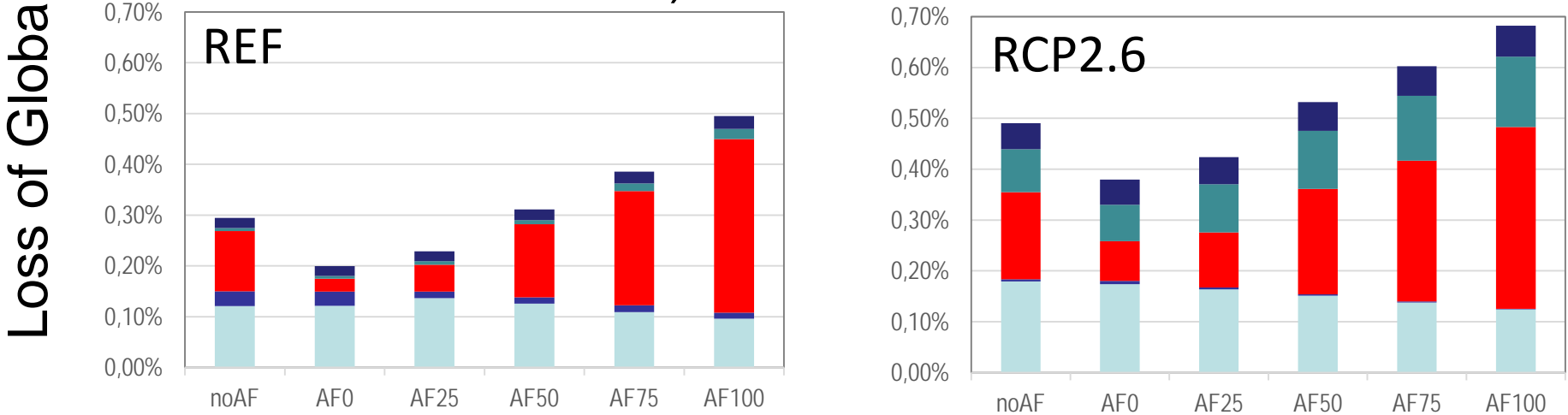


Global biodiversity loss due to EU28 forest management in year 2100

a) MFM scenarios



b) SFM scenarios



ALTERFOR IN A NUTSHELL

Alternative forest management approaches are needed to meet this century's challenges caused by climate change, the growing use of bioenergy, or complex global markets

Researchers in ALTERFOR explore current and alternative management models to provide the desired combination of environmental, economic, and social benefits

Alternative concepts for forest management will be developed together with stakeholders from the public, private, and civil society sectors in ten case study areas throughout Europe

ALTERFOR KEY FACTS

Project title: Alternative models and robust decision-making for future forest management

Project duration: 54 Months (01/04/2016 - 30/09/2020)

Ten case study areas in: Germany, Italy, Ireland, Lithuania, the Netherlands, Portugal, Slovakia, Sweden, and Turkey

Funding Scheme: The European Union's Horizon 2020 research and innovation programme (grant agreement No 676754). The grant totals EUR 4,000,000



www.alterfor-project.eu



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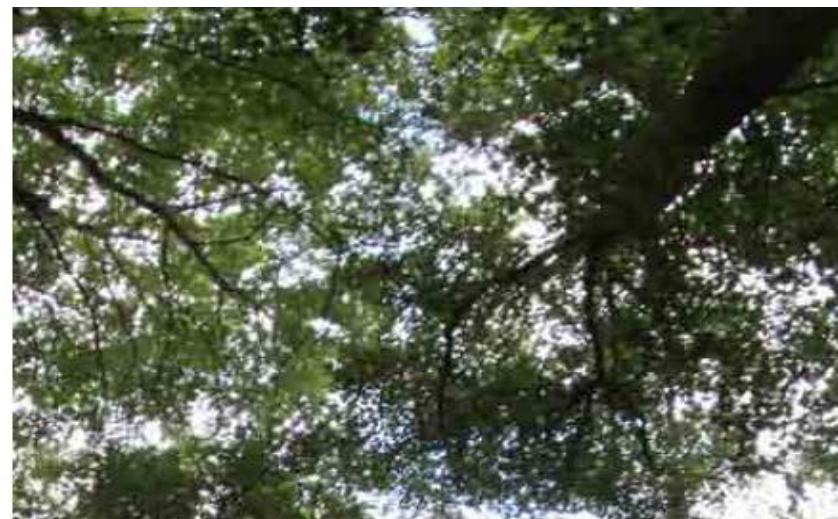
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PROJECT CONSORTIUM

Swedish University of Agricultural Sciences, Aleksandras Stulginskis University, Technical University in Zvolen, University College Dublin, University of Padua, University of Lisbon, Karadeniz Technical University, Technische Universität München, Georg-August-University Göttingen, Fraunhofer Center for International Management and Knowledge Economy IMW, Wageningen University & Research, International Institute for Applied Systems Analysis (IIASA), Joint Research Centre - European Commission, Southern Sweden forest owners association, Lithuanian Forest Inventory and Management Institute, Coillte Teoranta, ETIFOR, Associação Florestal do Vale do Sousa, General Directorate of Forestry, German Forest Society.



**ALTERNATIVE MODELS AND ROBUST
DECISION-MAKING FOR FUTURE FOREST MANAGEMENT**



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 676754.

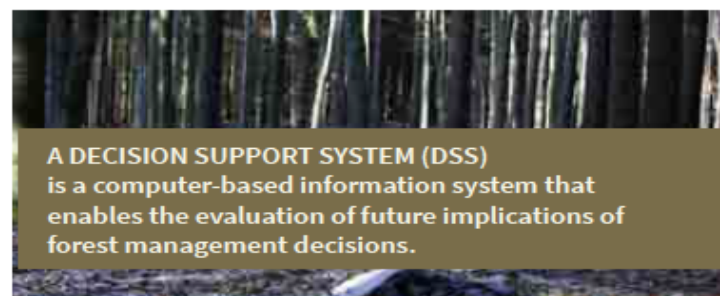
ALTERFOR DEVELOPS ALTERNATIVE MODELS AND FOSTERS ROBUST DECISION-MAKING FOR FUTURE FOREST MANAGEMENT

European forests are expected to provide a broad range of ecosystem services such as biodiversity, carbon sequestration, water quality, biomass production, or recreation. However, uncertainties caused by climate change, the growing use of bioenergy or complex global markets may necessitate alternative forest management models (FMMs).

In ALTERFOR, researchers and stakeholders from the public, private, and civil society sectors explore alternative approaches for forest management in ten case study areas throughout Europe. The alternative FMMs aim to provide the desired combination of environmental, economic, social, and cultural benefits, and to reduce vulnerabilities at stand to landscape levels.

The ten carefully designed case studies represent different forest management practices and socio-ecological conditions prevailing in Europe. The case study areas are located in Germany, Italy, Ireland, Lithuania, the Netherlands, Portugal, Slovakia, Sweden, and Turkey. The consortium of scientists and forestry practitioners will:

- provide deep knowledge regarding alternative FMMs and how they can result in the provision of ecosystem services
- involve relevant actors from different fields (such as forestry, nature conservation, renewable energy, and water management)
- facilitate efficient knowledge transfer to adopt alternative FMMs



SPECIFIC AIMS OF ALTERFOR

Identify and develop alternative FMMs in the case study areas and evaluate their benefits, limitations, trade-offs and synergies in terms of ecosystem goods and services (WP1 STAND LEVEL FOREST MANAGEMENT MODELS)

Develop global and European future scenarios. Assess the framework conditions for the FMMs at the landscape level¹, and assess the value of alternative FMMs across different land use sectors and borders (national, regional and EU/global) (WP2 GLOBAL ANALYSIS)

Upgrade existing decision support systems (DSS) tailored to the conditions in each landscape² and assess the capacity of different combinations of existing and alternative FMMs to sustain and optimize the desired basket of ecosystem services at the landscape level (WP3 LANDSCAPE LEVEL FMMs)

Analyse forest relevant actors in each landscape, and conduct actor-oriented assessment and capacity building for FMM alternatives at the local, national and EU levels (WP4 IMPLEMENTATION CAPACITY)

Achieve maximum impact of the research findings by communication and dissemination measures (WP5 COMMUNICATION AND DISSEMINATION)



¹In terms of demand for commodities, price developments, and land use pressures.

²To model the desired ecosystem services, comprising also climate change impacts, ES assessment, and spatial specificity.

TRAVELLAB

The project meeting places (e.g. in Sweden, Slovakia, Ireland, Portugal, or Germany) are all located in areas that represent different ecological and socio-economic conditions for forest management across Europe. The meeting sessions are accompanied by “Travellab”: an innovative format for cross-regional learning and knowledge transfer. It combines the conventional field excursion, round table discussions with local stakeholders, and follow up sessions. This facilitates a better understanding of the local context and improves knowledge about current and alternative FMMS and their implementation.

Within the project consortium, a group of ecosystem services (ES) experts³ provides support to estimate and assess the baskets of ES emerging under different future scenarios. Throughout the life of the project, the members of the expert groups advise the case study researchers beyond the borders of the work packages.

³Subject areas in the ES Expert group: biodiversity conservation, biomass production, carbon sequestration, water quality, regulatory services, and cultural services.

