

ALTERNATIVE FOREST MANAGEMENT MODELS - BRIDGING THE GAPS?

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An ALTERFOR workshop

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Video (Zoom)

22 September 2020, 10:00 am -2:45 pm (CET)



Alternative forest management models in different European regions: Lithuania (Telsiai)



- Forest management environment in Lithuania
- What if current forest management models are continued
- Brief introduction of alternative forest management models
- What if alternative forest management models are introduced
- Lessons learned?

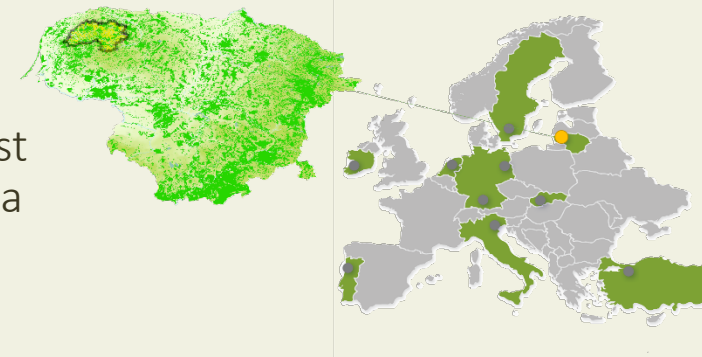
Since 2016

- **Changed**

- Legal status and names of partners
 - State company State Forest Inventory and Management Planning Institute → State company State Forest Enterprise
 - Aleksandras Stulginskis university → Vytautas Magnus university

- **Stable**

- Case study area
 - Area, managed by former SC Telsiai state forest enterprise, including private forests in the area
- Most of relevant stakeholders
- Forest management issues in Lithuania



The reform of Lithuanian state forestry sector



42 State forest enterprises
and Lithuanian Forest Inventory and Management Planning
Institute



State forest enterprise

2018

2019

3 486 number of employees

4 m Eur avg. annual operating income

26 000 ha avg. area of managed forest by one legal body

42 regional branches

3 500+ number of employees

160+ m Eur annual operating income

1 089 000 ha area of forest under management

26 regional branches (since January 2019)

Forestry in Lithuania nowadays



Since the 1990s - struggle between the traditional silvicultural focus on **maximizing sustainable timber production** and **increasing attention on environmental and social values**

- Timber - one of the few domestically available raw materials
- Modernization of forestry technologies
- Liberalization of international trade
- Privatization, including forestland restitution to pre-war landowners and their heirs
- Acceptance of international environmental standards
- Joining the EU
- “Greening” of society



Doubled the forest harvesting



Introducing or increasing environmental regulations, implemented through segregation management and integrative measures

Forest management environment in brief



- **Forest management system** in Lithuania – ideological base in the classical theory of **normal forests**:
 - Objective – productive stands that by the end of the (sufficiently long) rotation can deliver the **highest possible amount of timber of sawlog dimensions**
 - **Even forest age class distribution** to ensure the evenness of timber flow
 - **Strict rotation ages and area control of age classes**, rotation age not associated with the productivity
 - Segregative forest management through forestland zoning with 4 so-called **forest groups**

Strong **dominance of state forest institutions**, including the forest management requirements which are identical to state and private forest owners

Public opinion on forests and forestry – **negative**

Command-and-Control forest governance with detailed planning, legal prescriptions and scrupulous control. The **involvement of public** in taking forest management decisions – **low**

Forestry bureaucrat = the only forestry expert = **always right**

Public (or someone associated in some NGO) = the only forestry expert = **always right**



ALTERFOR suggests, that

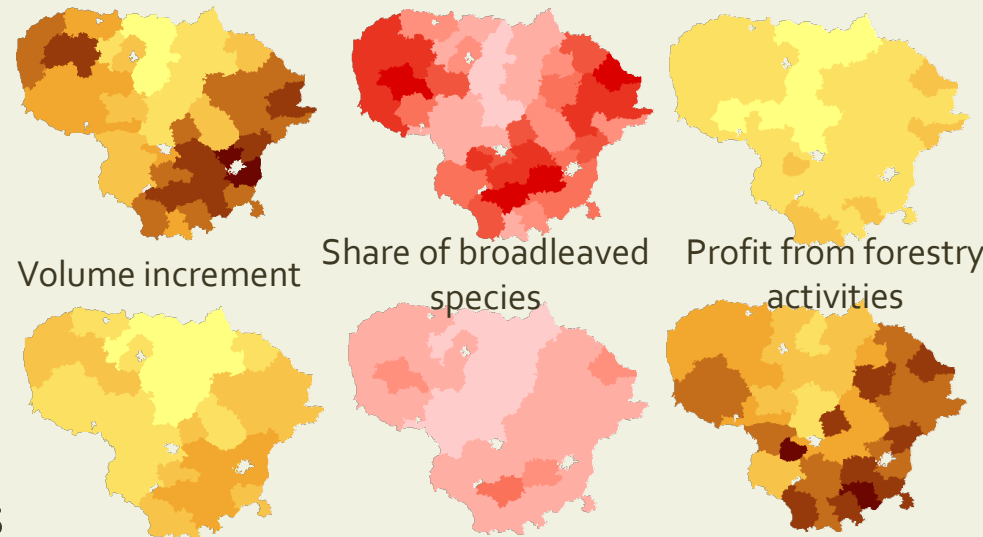


If **current forest management practices** are continued:

- **Clustered pattern** of climate change effects
- **Increases in stand productivity** and amount of **harvested timber** in the regions with dominating coniferous species
- Stronger **negative impacts** on dynamics of **biodiversity**-related attributes in the same areas

Do we intend to use the advantages and avoid the limitations of climate change? Any **alternative solution** is extremely difficult under conditions of command & control forest governance, nevertheless...

Current climate change mitigation efforts — temperature increase of ca. **3.7 °C** by 2100 compared to pre-industrial values



Strong EU policies in climate change mitigation — temperature increase of ca. **2.5 °C** by 2100 compared to pre-industrial values



Alternative forest management models tested in Lithuania



We believe, that they cover most acute forestry problems in Lithuania nowadays

Strategic goal for sustainable and **RESPONSIBLE** forest management assumes our responsibility **BOTH** for **sustainability of ecosystems** and **maximizing of the forest input on the welfare** of the people and the country



Objectives: to stop reducing the share of deciduous trees, first of all birch, aspen (i.e. the ones recently considered as the weeds in the forest), to demonstrate the sustainability of forestry with slightly **changed tree species priorities**, to be in a line with current forestry developments in Lithuania



Objectives: to fulfil Lithuanian international commitments



ADAPTIVE ROTATION AGES

CARE FOR DECIDUOUS

POTENTIAL EU HABITATS



**PRODUCTION-ORIENTED
MANAGEMENT (PM)**



**MULTIFUNCTIONAL
MANAGEMENT (MM)**



SET ASIDES (SM)

Definitions used in ALTERFOR's Policy Brief 2

Alternative forest management models tested in Lithuania



ADAPTIVE ROTATION AGES

Limitations of current forest management model:

Final cutting ages are estimated based on stand **technical maturity**

Inflexible in respect the market demands for **specific assortments**

Does **not consider costs** of silvicultural and harvesting activities

Does **not consider the time value**

Is **not differentiated** according to forest **growing conditions**

Current final cutting ages are **usually too high**, resulting in **lower timber production** and increased **risks of damage**

In some occasions, this indirectly **leads to decreasing biodiversity and cultural ESs**

PRODUCTION-ORIENTED MANAGEMENT (PM)

Specification of alternative forest management model:

Based on estimating minimum allowable rotation age (MARA) using **two** methodological approaches:

Economic rotation, based on maximum forest rent, i.e. average annual net income

Financial rotation, based on present net value using 2% interest rate

Differentiated **by tree species** and **soil** conditions

Usually, **lower than current** final cutting age, but **higher on some soil** types for some species

Alternative forest management models tested in Lithuania



CARE FOR DECIDUOUS

MULTIFUNCTIONAL MANAGEMENT (MM)

Limitations of current forest management model:

Lithuanian forestry has long been focused on **growing coniferous forests**

The **share of spruce is expected to increase**

Current ALTERFOR's FMMs on short and medium rotation deciduous stands are how to **turn them into FMMs for coniferous**

May have some **negative impact on some ecosystem services** (biodiversity, cultural) in a long run, mostly due to decreased species diversity, dropping the share of broadleaves and jumping the volumes of spruce

Specification of alternative forest management model:

Within the frames of current forestry concepts and numerous legislative acts (e.g. "Regulations for reforestation and afforestation")

Regeneration: regeneration schemes with adjusted the tree species proportions, **prioritizing** some **deciduous tree species**

Thinning cuttings: manipulations with the frequencies and intensity of thinning cuttings

Final cutting: changing the priorities for some final cutting types, to manipulate the regenerated species

Otherwise, like current forest management models

Alternative forest management models tested in Lithuania



NO MANAGEMENT AT POTENTIAL HABITATS OF EUROPEAN IMPORTANCE

Limitations of current forest management model:

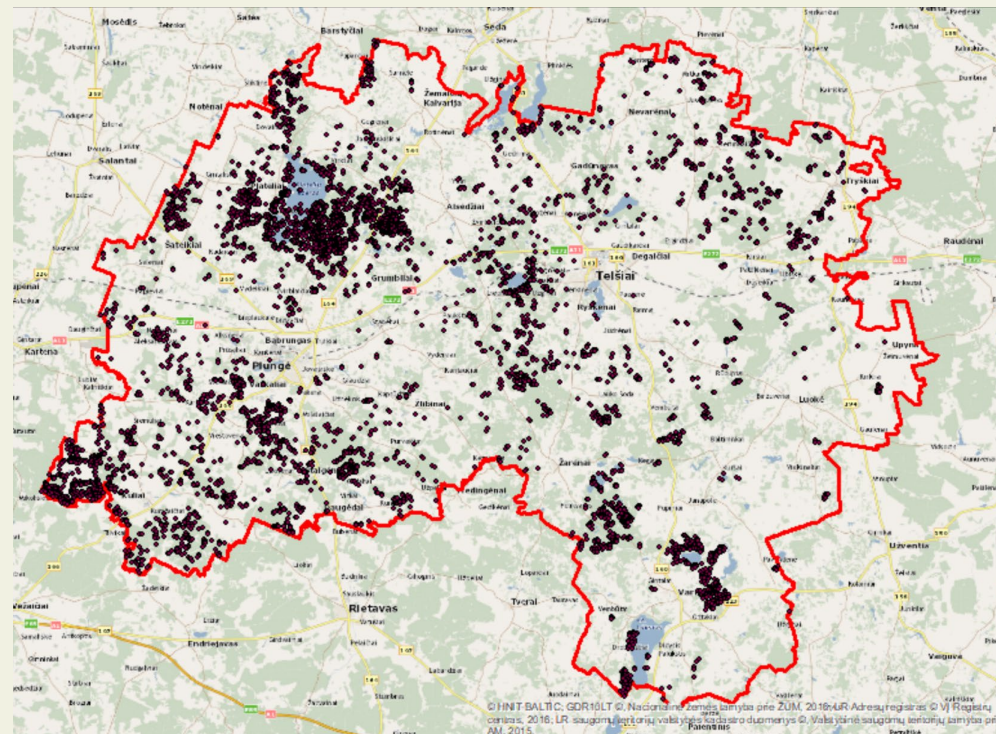
Commitments of Lithuania to increase the areas with habitat protection

Specification of alternative forest management model:

No active forest management in potential habitats of European importance

Otherwise, like current forest management models

SET ASIDES (SM)



Potential habitats of European importance in the CSA

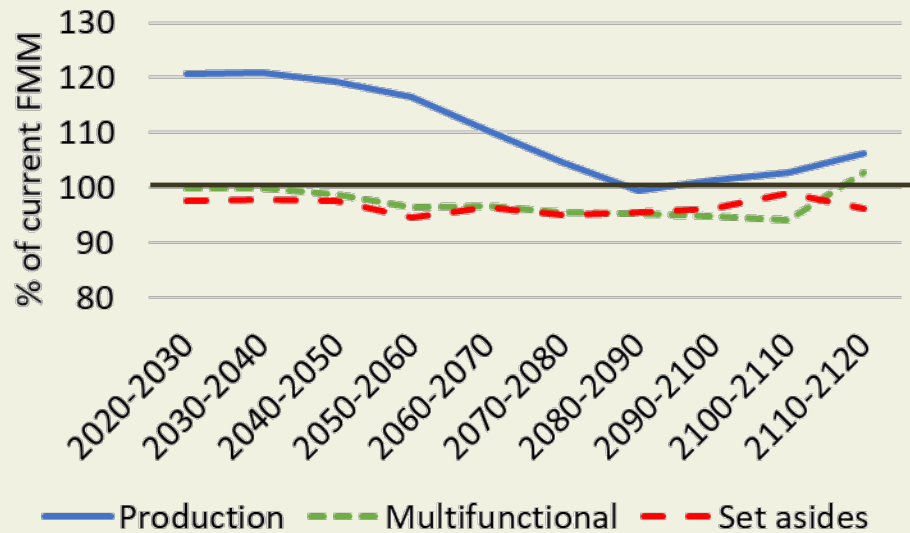
Impact of **alternative forest management models** ALTERFOR on delivery of forest ecosystem services in the period 2020-2060



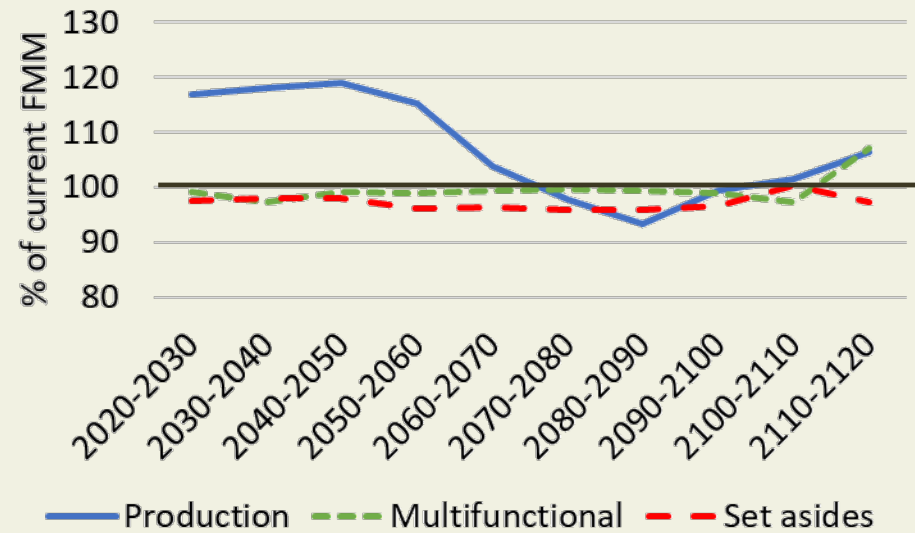
What if alternative FMMs are introduced?



Impact of alternative forest management models on **TIMBER SUPPLY**



Total harvested timber

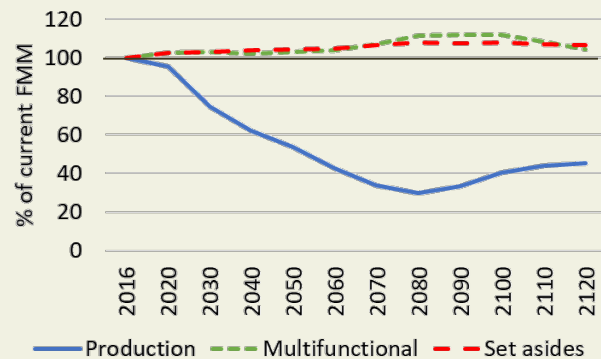


Harvest – increment ratio

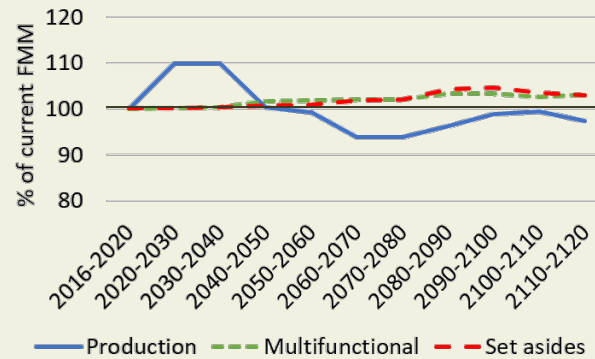
What if alternative FMMs are introduced?



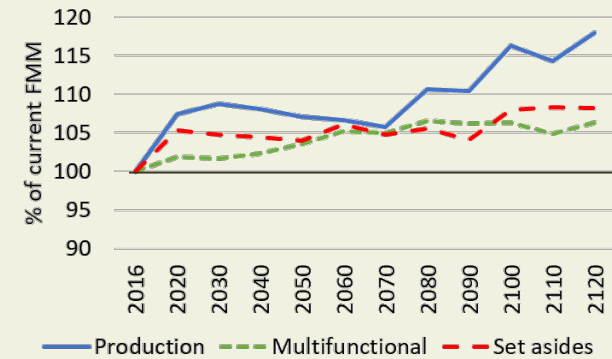
Impact of alternative forest management models on BIODIVERSITY



Volume of trees with diameter over 50cm



Volume of deadwood per year

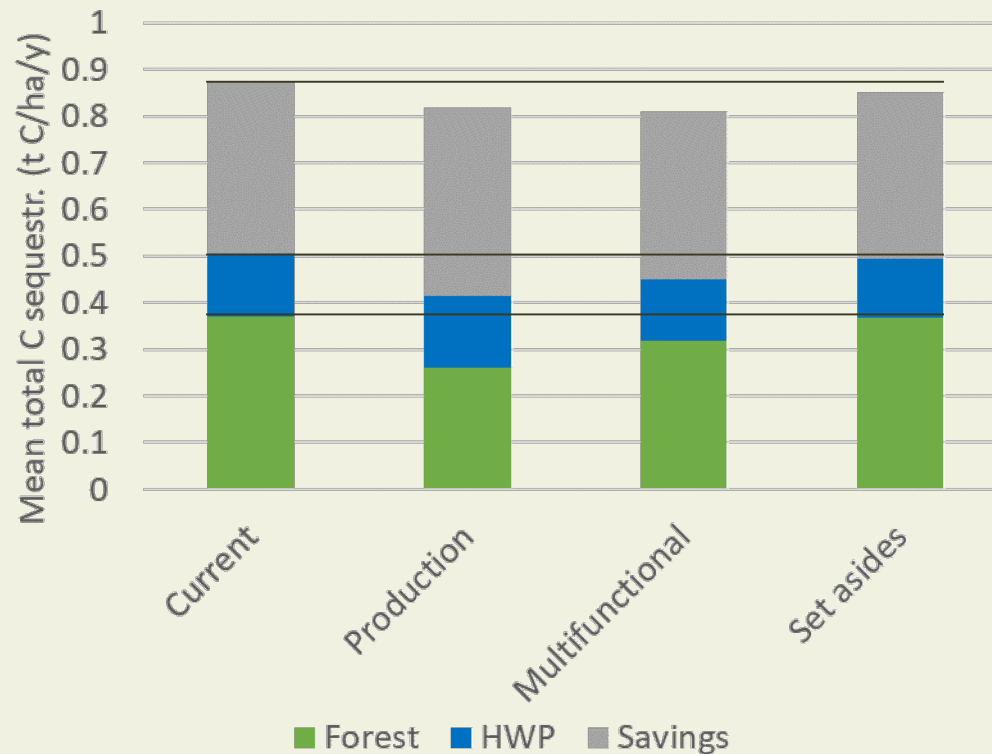


Tree species diversity (based on Shannon evenness index)

What if alternative FMMs are introduced?



Impact of **alternative forest management models** on **CARBON SEQUESTRATION** (1)

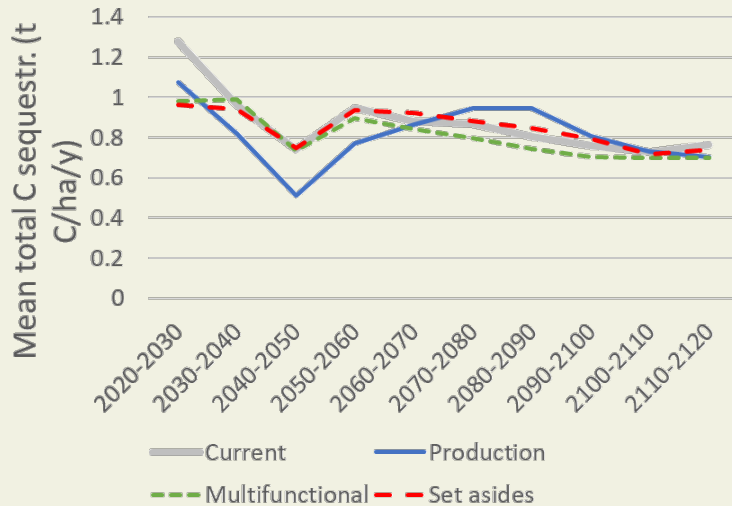


Total carbon balance during next 100 years

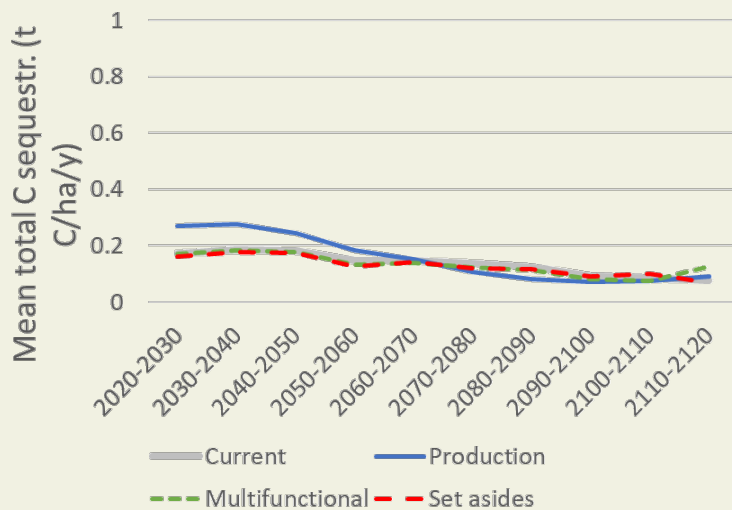
What if alternative FMMs are introduced?

Impact of alternative forest management models on CARBON SEQUESTRATION (2)

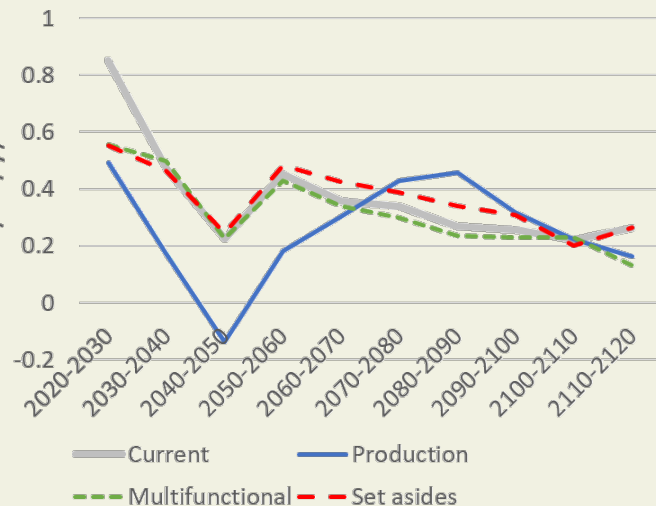
Total carbon balance
by decades



Carbon in harvested
wood products

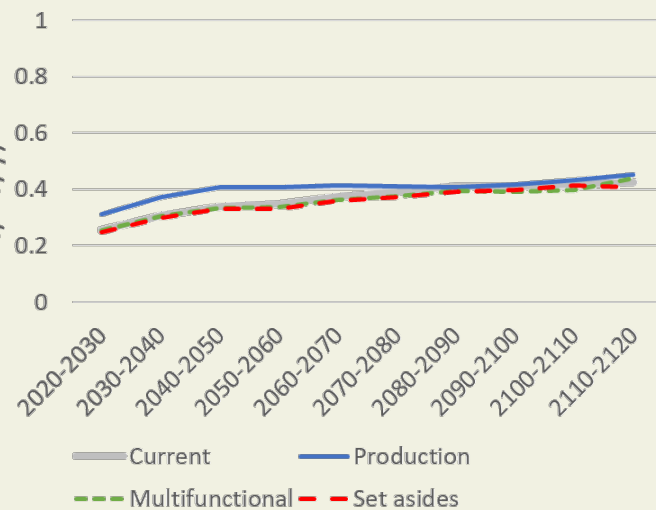


Mean total C sequestr. (t C/ha/y)



Carbon in forest
biomass

Mean total C sequestr. (t C/ha/y)



Substitution effect

Lessons learned

Notably increased timber harvesting under PM does not automatically reduce some cultural or biodiversity related ecosystem services, neither the extra set-aside areas do always improve the biodiversity potential at the landscape level

Combinations of PM, MM and SM approaches should be applied to secure sustainable forest management under conditions of climate change mitigation efforts

Decision support tools should be used aiming for adaptive forest management under changing conditions. ALTERFOR developed DSS functionality to deal with changing climate and multiple forest ecosystem services and tested them with alternative forest management models, including carbon balance calculator to deal with all carbon pools

Alternative forest management models in different European regions: Lithuania (Telsiai)



Thanks for your attention

For more information:

ALTERFOR materials at <https://alterfor-project.eu/>

Mozgeris, G.; Brukas, V.; Pivoriūnas, N.; Činga, G.; Makrickiene, E.; Byčenkienė, S.; Marozas, V.; Mikalajūnas, M.; Dudoitis, V.; Ulevičius, V.; Augustaitis, A. Spatial Pattern of Climate Change Effects on Lithuanian Forestry. *Forests*. 2019, vol. 10, iss. 9, p. 1-28.

<https://www.mdpi.com/1999-4907/10/9/809/pdf>

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