

# WP1

---

Alterfor Final Conference 2020-09-11

Kristina Wallertz och Eric Agestam



# WP1 “Forest management and Ecosystem services today and tomorrow”

WP1 four deliverables, (FMM= Forest Management Models)

- |                           |                  |
|---------------------------|------------------|
| 1. FMM models description | Deliverable D1:1 |
| 2. Alternative FMMs       | Deliverable D1:2 |
| 3. Guidelines             | Deliverable D1:3 |
| 4. Demo-sites             | Deliverable D1:4 |

Together with local case coordinators WP1 have worked with alternatives to existing management.

- Some examples of aFMMs (one from each country)
- Motivation for the choice of aFMM

### Examples

- Park management
- Oak for cork production
- Even aged mixed forest
- Sitka spruce and Douglas fir
- Continuous cover forestry
- Oak biodiversity set-aside
- Lodgepole pine wilderness
- Recreational selective
- Adaptive rotation

# *What are the main reasons for selecting the aFMMs?*



## **Biodiversity**

*Environmental values*

*Eco system services*

*Recreation*

*Social values*

*Water quality*

*Natural land use*

*Cultural*

*Close to nature*

*More broadleaves*

## **Production**

*Carbon sequestration*

*Saw-log production*

*Cash-flow*

*Sustainability and economics in spruce stands*

*Green energy and biomass*

## **Risk**

*Climate change*

*Biotic and abiotic damage*

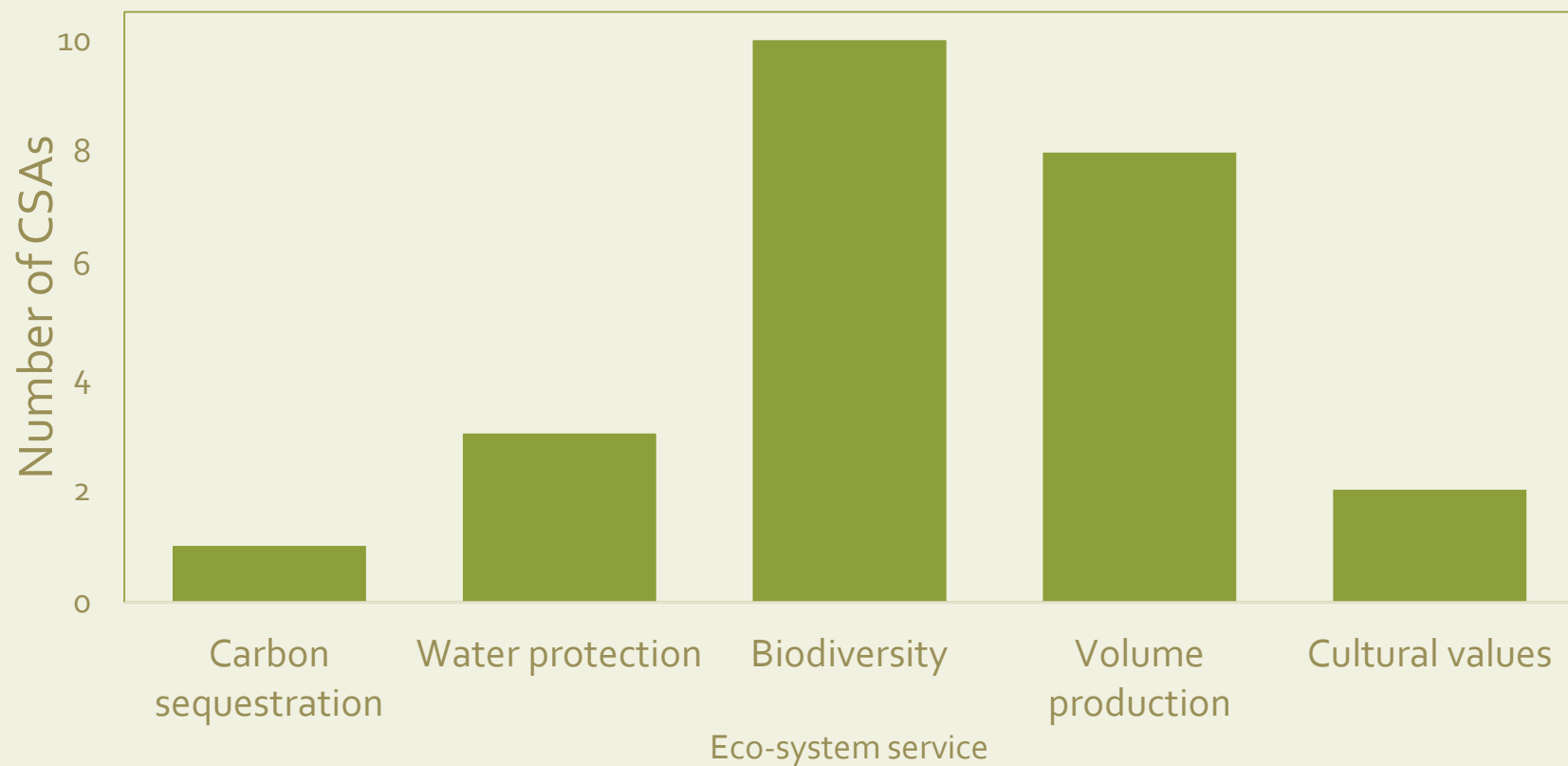
*Spreading the risks*

## **Wood production AND biodiversity together**

*More broadleaves*

*Natural regeneration*

*Mixed forests*



# Examples of guidelines Germany

## Empfehlungen für die Praxis aus dem EU Projekt ALTERFOR

### „Alternative Modelle und robuste Entscheidungsunterstützung für die Waldbewirtschaftung in der Zukunft“

(Alternative models and robust decision-making for future forest management)

Peter Biber

Lehrstuhl für Waldwachstumskunde, Technische Universität München

#### Einleitung

Dieser Text fasst wesentliche Ergebnisse aus den deutschen Fallstudien des EU Projektes ALTERFOR für die forstliche Praxis zusammen. Er ist nicht mit einem waldbaulichen Ratgeber zu verwechseln, sondern will über Möglichkeiten und Grenzen der verschiedenen Ansätze zur Waldbehandlung informieren, die sich bei der Bearbeitung des Projektes gezeigt haben. Da der Arbeitsschwerpunkt des Projektes auf der Ebene ganzer Waldlandschaften lag, bedürfen die hier vorgestellten Konzepte immer einer Anpassung an die Verhältnisse im konkreten Bestand. Waldbesitzern ohne forstliche Ausbildung muss in jedem Fall dringend die Inanspruchnahme der Beratung vor Ort durch die jeweils zuständige Forstverwaltung ans Herz gelegt werden. Weiterführende Informationen zum Projekt, seinen Ergebnissen und Demonstrationsflächen erhalten Sie unter der Kontaktadresse am Ende dieses Textes.



## Holzproduktion

Dieses Szenario zielt auf eine Maximierung der nachhaltigen Holzproduktion ohne Rücksicht auf weitere Ökosystemleistungen ab. Dies wird erreicht durch Erhalt und Aufbau hoch produktiver gleichaltiger Nadelholzbestände bei relativ kurzen Umtriebszeiten und geringen Vornutzungen. In nadelholzdominierten Beständen werden bis zum Erreichen des Endnutzungsstadiums Niederdurchforstungen durchgeführt und danach in einer zügigen Abfolge von Schirmhieben geräumt. In Laubholzbeständen wird mit Z-Baum bzw. Auslesedurchforstung gearbeitet, bis schnittholzfähige Baumdimensionen erreicht sind. Danach werden die Bestände zügig per Schirmhieb geräumt und die Fläche mit Nadelholz bepflanzt). Tabelle 2 listet das typische Vorgehen auf.



Abb. 4. Auf maximale Holzproduktion bewirtschafteter Fichtenbestand (Versuch Fürstenfeldbruck 612, Foto: L. Steinacker).s

|                                      |                    |           | zehnjähriges Eingriffsintervall   |
|--------------------------------------|--------------------|-----------|---|
|                                      |                    | 17 – 30 m | Auswahl von 75 Z-Bäumen je ha, Entnahme von je einem Bedränger, zehnjähriges Eingriffsintervall |
|                                      |                    | > 30 m    | Räumung des Bestandes mit wenigen Schirmhieben in kurzer Abfolge, Pflanzung von Fichten         |
| Lieberose-Schlaubetal-Neuzelle (LSN) | Nadelholz (Kiefer) | 12 – 18 m | Niederdurchforstung, max. Entnahme 30 m³/ha je Eingriff, zehnjähriges Eingriffsintervall        |
|                                      |                    | 18 – 27 m | Niederdurchforstung, max. Entnahme 40 m³/ha je Eingriff, zehnjähriges                           |

# The Netherlands



Maatregelen Voorbeeldprojecten Feiten en cijfers Achtergrondinformatie



## Klimaat Klimaatbos- en Natuurbeheer

Bosbeheer Bosaanleg Agroforestry Landschap Overige natuur

### Klimaat Klimaatbos- en Natuurbeheer

#### NOOT: AAN DEZE WEBSITE WORDEN VOORTDUREND NIEUWE MAATREGELEN, VOORBEELDPROJECTEN EN ANDERE FUNCTIES TOEGEVOEGD

De Nederlandse overheid heeft het tegengaan van klimaatverandering opgenomen als een van de speerpunten van haar beleid, zoals afgesproken in het akkoord van Parijs in 2015. Van elke sector wordt een bijdrage verwacht in het halen van de doelstellingen met betrekking tot de reductie van de CO<sub>2</sub> uitstoot. De sector bos, bomen en natuur (BBN) heeft de doelstelling om in 2030 0,63 miljoen ton CO<sub>2</sub> per jaar extra vast te leggen ten opzichte van de huidige 1,5 miljoen ton die jaarlijks in deze sector wordt vastgelegd.

Deze gereedschapskist biedt beheerders van bos, natuur en landschap concrete handvaten voor het uitvoeren van klimaat Klimaatbos- en natuurbeheermaatregelen in Nederland. Klimaat Klimaatbos- en natuurbeheer richt zich op 3 pijlers: 1) versterken van de klimaatmitigatie (CO<sub>2</sub> vastlegging), 2) versterken van de adaptatie aan klimaatverandering, en 3) versterken van de productiefunctie en inkomsten. Daarbij geldt heel sterk dat er niet één oplossing of remedie is. Bij klimaat Klimaatbos- en natuurbeheer wordt heel goed naar de lokale omstandigheden gekeken en worden de maatregelen daar naar aangepast, zodat win-win situaties ontstaan met bijvoorbeeld biodiversiteit, productiefuncties of juist het Natuurnetwerk Nederland. Klimaat Klimaatbos- en natuurbeheer kan dus zowel gaan om het instellen van strikte reservaten als het aanleggen van productiebossen, tot aan combinaties met bijvoorbeeld de landbouw.

Lees meer

Vind maatregelen voor:

# Use of modern technology

- The Netherlands - a very nice example of
  - 1) co-operation with other actors
  - 2) homepage
- <https://www.vbne.nl/klimaatslimbosennatuurbeheer/>
- Establish forest
- <https://www.vbne.nl/klimaatslimbosennatuurbeheer/projecten/26/voorbeeldproject-essenomvorming-siddebure>
- More:
- <https://www.vbne.nl/klimaatslimbosennatuurbeheer/projecten/14/voorbeeldproject-stimuleren-verjonging-elspeterbosch>

## La gestione forestale finalizzata ai servizi socio-culturali

### Linee guida

Giulia Corradini, Mauro Masiero e Davide Pettenella  
Università di Padova  
Dipartimento Territorio e Sistemi Agroforestali, TESAF



Figura 2 - Esercizi di rilassamento in foresta



Figura 3 -

Tale classificazione non è da intendersi  
da farsi con riferimento alle singole atti  
vità di sovrapposizione con gli ambiti i  
carattere terapeutico-riabilitativo e/o si  
cura ed alla riabilitazione degli indi  
vidui. Secondo i casi, pertanto, va



Figura 14 - Uso di legno, cartelloni, senso di mistero nel

erale, le persone tendono a voler parcheggiare il più vicino pos  
sibili, vie escursionistiche ecc. In prossimità di zone quali aree  
a silvopastorale, per attrarre il rumore e in maniera ridotta non

in un certo numero di stagioni prima di essere completamente degrada  
ti rimarranno presenti e visibili, con un conseguente impatto negativo.



Figura 15 Cartelli informativi in sostituzione dei cestini per rifiuti nel Parco Adamello Brenta

Fonte: Foto Archivio PNAB

Alcuni studi, invece di confrontare specifiche attività ricreative, valutano differ  
ricreativo attivo e uso scenico passivo. Tahvanainen et al. (2001) hanno scoperto che q  
chiesto agli intervistati di svolgere attività ricreative attive, gli intervistati preferiscono  
forestale naturale, cioè poco disturbato dall'intervento antropico; invece, per uso s  
hanno una forte preferenza tra i tipi di gestione.



con densità del 50% sono state osservate condizioni di umore più stabile e vigoria attiva, fattori  
che sono stati messi in relazione a condizioni di rilassamento cerebrale e si traducono in maggiore  
stabilità psicologica. Quanti riportato sopra in merito alla densità trova riscontro anche in Herzog et  
al. (2000), secondo i quali spazi aperti incontrati nella foresta, che interrompono la monotonia degli  
spazi chiusi, trasmettono ai visitatori sensazioni di calma e tranquillità.

#### c. Familiarità con

Diversi studi hanno vi  
caratteristiche della fo  
Una connessione forte  
positiva verso i valori i



Figura 13 - Pratiche per aumentare il benessere in ambiente naturale

Siti forestali che presentano condizioni di maggiore visibilità e accessibilità fisica tendono ad avere  
valutazioni di preferenza più alte. Foreste con evidenti segni di taglio e operazioni selvicolturali sono  
di contro meno soggette a gradimento, tuttavia foreste gestite caratterizzate da percorsi o sentieri  
possono essere preferite rispetto a foreste completamente naturali e prive di simili infrastrutture  
Rita del Bosco Verde - 2008

attività culturali come le rappresentazioni teatrali) purché nel rispetto delle valenze naturalistiche e delle funzioni dell'ecosistema.

# Italy, cont.



(2006) in Catalogna (Spagna), hanno messo in luce come le persone reputino che "maggiore è il diametro dei tronchi, maggiore è la bellezza scenica". Paquet e Belanger (1997) hanno riscontrato un crescente apprezzamento anche in relazione all'altezza degli alberi: secondo il loro studio condotto in Francia, la quasi totalità degli intervistati ha manifestato apprezzamento per paesaggi con piante di altezza pari almeno a quattro metri. L'apprezzamento per la grandezza dei fusti può essere anche connesso ad attributi rafforzativi quali la densità relativamente bassa del popolamento: come sottolinea Ribe (1989), in presenza di alberi maturi la densità del bosco tende a essere più contenuta e la presenza del sottobosco è moderata, così da non costituire intralcio eccessivo alle attività di fruizione.



Figura 5 Una foresta con diametri considerevoli nell'Oregon occidentale (Stati Uniti). Diametri di grandi dimensioni sono considerati essere elementi che aumentano il valore ricreativo di un sito forestale

gli Stati Uniti mostrano come trattamenti selvicolturali a tagli successivi, tagli, ivi compresi i trattamenti selvicolturali che diano una copertura continua, solo alberi, sono le opzioni di gestione esteticamente preferite dai visitatori



Figura 6 - tagliate di grandi dimensioni in British Columbia (Canada)

## c. Residui di taglio e diradamenti

Le ricerche indicano come, in generale, la presenza di residui di taglio non sia apprezzata dal pubblico e, in particolare, dai fruitori delle aree forestali (Arthur, 1977; Brush, 1979). Con riferimento alle foreste dell'ovest americano, Ribe (1989) ha evidenziato come la miglior azione mitigatrice dell'impatto visivo degli interventi selvicolturali sia, in aggiunta al contenimento dell'estensione e frequenza degli stessi, quella di ridurre l'evidenza di residui di taglio, in quanto universalmente non apprezzata. Axelsson-Lindgren (1985) riporta come la ramaglia rilasciata a



Figura 22 - Esempio di cromie diversificate per effetto della stagionalità



Figura 7 - Operazioni forestali e residui evidenti di taglio presso l'altopiano di Asilano (FVG)

ditore e spesso esempio di wilderness, ispira nuovi alle dinamiche e ai processi natur

## d. Penetrazione visiva nel popol

Si definisce penetrazione visiva il live termini, semplificando fortemente il Secondo lo studio di Edwards et al. ( una visibilità molto bassa o molto alta, più apprezzati livelli intermedi. Questi ancestrale che l'uomo avrebbe di ved un numero "equilibrato" - né troppo e



# Turkey

oluşturulmaya çalışılır. Bu yapı özellikle gölge ve yarı gölge ağaçlarının olduğu meşçelerde daha da önemlidir. Bunun için meşçelerde alt ve ara tabakanın gelmesi ve gelişmesi yönünde bazı müdahaleler yapılır. Orman dinamiğine göre müdahalelerin şekli ve şiddeti ayarlanır. Ladin ve Kayında olabilir. Küçük gruplarda da olabilir (Şekil 6).

## „Guidelines“

### ORMANLARIN PLANLANMASINDA ALTERNATİF BİR SILVİKÜLTÜREL YAKLAŞIM: “DEVAMLILIK ORMAN” KILAVUZU



Şekil 6. Yatay kapallık (Nolet vd., 2017)

macı

Orman ve Eta ilişkisi:

| İk/Ekonomik              |              |
|--------------------------|--------------|
| Fonksiyonel              | Dönüş        |
| Eta (m <sup>3</sup> /ha) | Süresi (yıl) |
| Knbc3                    | 58           |
| Knc3                     | 152          |
| Kncd3                    | 258          |
| Knd3                     | 525          |
| KnDyb3                   | 70           |
| KnDybc3                  | 109          |
| Knd/b3                   | 188          |
| Knbc3                    | 141          |

| Meşçere | Servet               | Artım                | Fonksiyonel              | Dönüş        | Fonksiyonel              | Dönüş        |
|---------|----------------------|----------------------|--------------------------|--------------|--------------------------|--------------|
| Tipleri | (m <sup>3</sup> /ha) | (m <sup>3</sup> /ha) | Eta (m <sup>3</sup> /ha) | Süresi (yıl) | Eta (m <sup>3</sup> /ha) | Süresi (yıl) |
| Knbc3   | 58                   | 5.0                  | 6                        | 10           | -                        | -            |
| Knc3    | 152                  | 6.1                  | 8                        | 10           | 16                       | 10           |
| Kncd3   | 258                  | 6.7                  | 16                       | 10           | 30                       | 10           |
| Knd3    | 525                  | 7.3                  | 18                       | 10           | 36                       | 10           |
| KnDyb3  | 70                   | 5.6                  | 6                        | 5            | 10                       | 5            |
| KnDybc3 | 109                  | 6.5                  | 10                       | 10           | Tip yok                  | 10           |
| Knd/b3  | 188                  | 5.1                  | -                        | -            | 80                       | 10           |
| Knbc3   | 141                  | 7.3                  | -                        | -            | 16                       | 10           |



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

Nieminen, M. Hökkä, H., Laiho, R., Juutinen, A., Ahtikoski, A., Pearson, M., Kojola, S., Sarkkola, S., Launainen, S., Valkonen, S., Penttilä, T., Lohila, A., Saarinen, M., Hahti, K., Mäkipää, R., Miettinen, J., Ollikainen, M., 2018. Could continuous cover forestry be an economically and environmentally feasible management option on drained boreal peatlands? Forest Ecology and Management, 424, 78-84.

Nolet, P., Kneeshaw, D., Messier, C., Béland, M., 2018. Comparing the effects of even- and uneven-aged silviculture on ecological diversity and processes: A review, Ecology and Evolution, (8) 1217-1226. doi: 10.1002/ecs3.3737

OGM, 2008. Orman Amenajman Yönetmeliği, Resmi Gazete Tarihi: 05.02.2008, Sayısı: 26778, 28 s. <https://www.ogm.gov.tr/ekutuphane/Yonetmelikler/Orman%20Amenajman%20Yonetmeliği.pdf>

OGM, 2011. Kulakaya Orman İşletme Şefliği Orman Amenajman Planı (2011-2020), Orman Genel Müdürlüğü, Ankara, 212 s.

OGM, 2014. Silvikültürel Uygulamaların Teknik Esasları, Tebliğ No: 298, Orman Genel Müdürlüğü, Ankara, 144 s. <https://www.ogm.gov.tr/ekutuphane/Tebliğler/Silvikültürel%20Uygulamaların%20Teknik%20Esasları.pdf>

OGM. 2017. Fküstem Tahanlı Fonksiyonel Orman Amenajman Planlarının Düzenlenmesine Alt Uçul ve Esasları. No:



Şekil 4. Gölçük Orman İşletme Müdürlüğünde devamlı orman olarak işletilebilecek bir meşçere

## Sitkagran (Picea sitchensis (Bong.) Carr.)

Sitkagran har sitt ursprung från kustnära trakter utmed Nordamerikas västkust (från Kalifornien i söder till Alaska i norr) där klimatet är utpräglat maritimt, med hög nederbörd och milda vintrar.

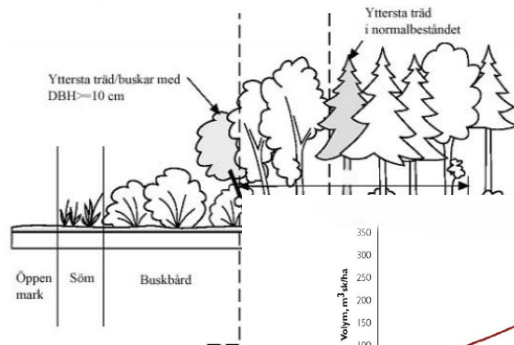
### Utseende

Sitkagran kan i sitt ursprungsland nå höjder över 90 m och bli över 700 år. Barken har grova, flagnande fjäll och kronan är smalt konisk. Barren är karakteristiskt vassa och stickiga med mörkgrön oavsida och två silvervita band på undersidan. Kottarna är korta och trubbigt cylindriska 6-10 cm långa.

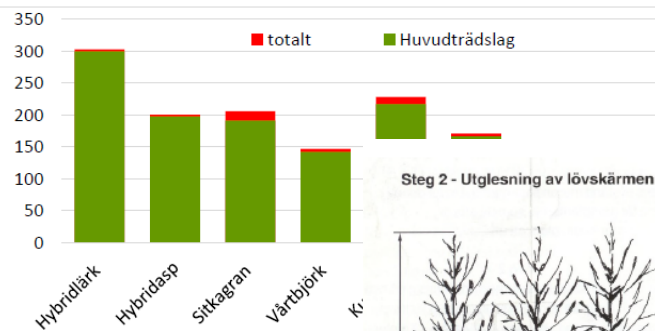


### Allmänna ekologiska karaktärer

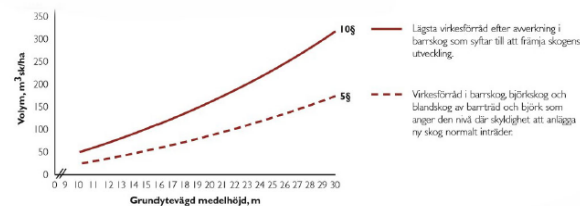
Sitkagran har pionjära egenskaper och har därmed en snabb start efter plantering. Den föredrar



Figur 1. Tvärsnitt genom skogsbryn med buskbård och



Figur 4 Totalproduktion för trädslagen på den högsta Huvudträdsdraget markerat med grön färg och övriga



Figur 5 Virkesförädlingsdiagram Skogsvårdslagen § 10 och § 5. Från: www.skogsstyrelsen.se

### Läs mer om olika metoder

SLUs forskningsprogram Future Forest har publicerat en sammanställning av olika aspekter på hyggesfritt skogsbruk med många litteraturreferenser. Mer att läsa om olika metoder finns på skogsstyrelsens hemsida. En fyllig beskrivning av blädning finns i "Blädningsskript" av Lars Lundqvist, Jonas Cedergrens Lars Eliassons (skogsstyrelsen, skogsskötserier nr 11). Se litteraturrutan nedan.

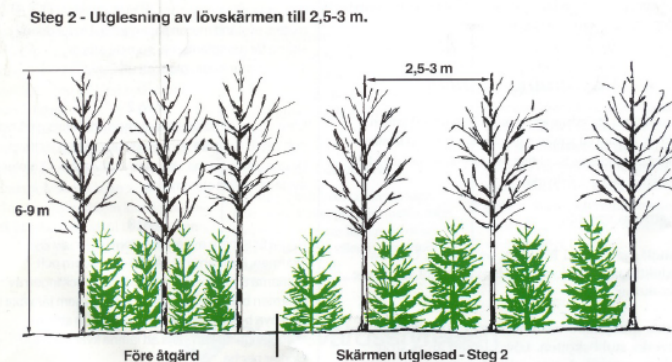
### Mer att läsa

Intresset för hyggesfria metoder är stort och de senaste decennierna har en hel del information publicerats:

Några sammanställningar som särskilt kan rekommenderas:

Information om hyggesfritt skogsbruk på Skogsstyrelsens hemsida;

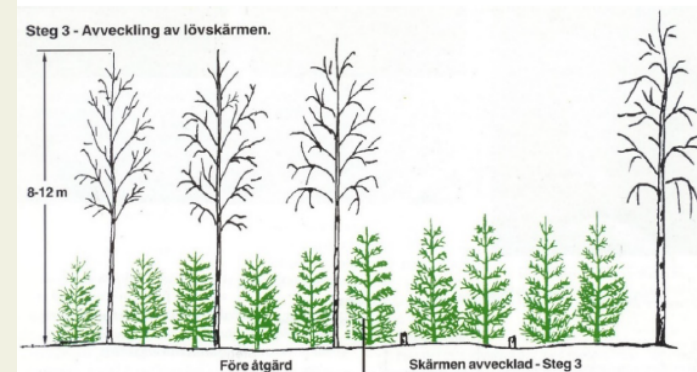
<https://skogsstyrelsen.se/globalassets/mer-om-skog/hyggesfritt/hyggesfritt-skogsbruk-broschyr-2010.pdf>



Figur 2 Andra steget, lövskärmen glesas ut

### Steg 3

Vär björkarna är kring 10 till 12 meter behövs ett tredje ingrepp för att ge björk utvecklingsmöjligheter. Antingen kan alla björkar avverkas och beståndet överföra till granbestånd, eller tvärtom, om björken växer bra och är av god kvalitet kan det vara att behålla på björk, och ett tredje alternativ är att behålla både gran och björk.



Figur 3 Tredje steget, skärmen avvecklas eller fina björkar lämnas

# WP1 – AFMM GUIDELINES IRELAND

---

*WP1*

*Anders Lundholm*

*Online*

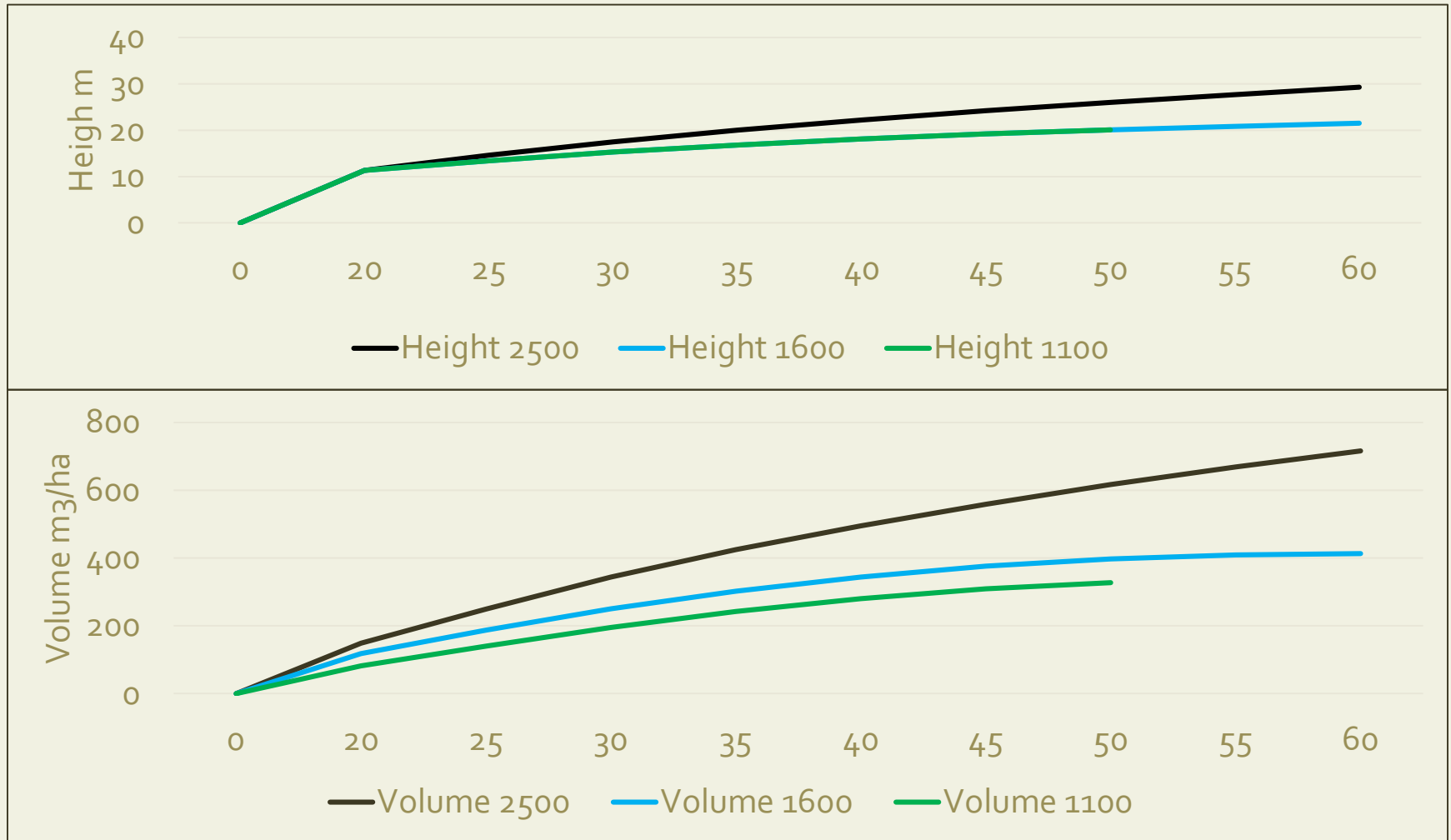
*11/09/2020*



# Low-stocked lodgepole pine

|                           | Normal                     | Bioenergy                  | Biodiversity                               |
|---------------------------|----------------------------|----------------------------|--|
| Planting density stems/ha | 2,500                      | 1,600-2,000                | 1,100                                      |
| Planting cost €/ha        | 2,500                      | 1,689-2,111                | 1,161                                      |
| Ideal YC                  | >12                        | 10-12                      | <10  |
| Management after planting | Clearfell around age 40-45 | Clearfell around age 50-60 | Indefinite retention                       |
| Objective                 | Produce pulpwood           | Produce cheap pulpwood     | Create open habitat, maintain forest cover |

# YC 12 – Height and volume



# For whom?

- Owners of low productivity blanket peat forest
- Primarily Coillte – ca 29%, or 155,000 ha, of Irish forest estate on blanket peat
- 66% public, 34% private

# Utilisation

- In theory – high uptake and established on poor sites
- In practice - requires site by site approval by Forest Service & ambiguity of guidelines regarding acceptable stocking
- Standard management in future?
- Site established with 2,000 stems/ha in 2019
  - Immediate planting due to weevil

# Uncertainties

- Low stock forest = invasion of common rhododendron (*Rhododendron ponticum*)
- Volume growth not materialise
- Mortality high impacts on already low stock forest
- Future management of forest on erosion susceptible sites

# INFORMING FOREST STAKEHOLDERS

## – Portugal case study

*ALTERFOR Final Conference – WP1*

---

*Ana Raquel Rodrigues, Brigitte Botequim, Carlos Caldas, Marlene Marques, Sandra Pinto,  
Américo Mendes & José Borges*

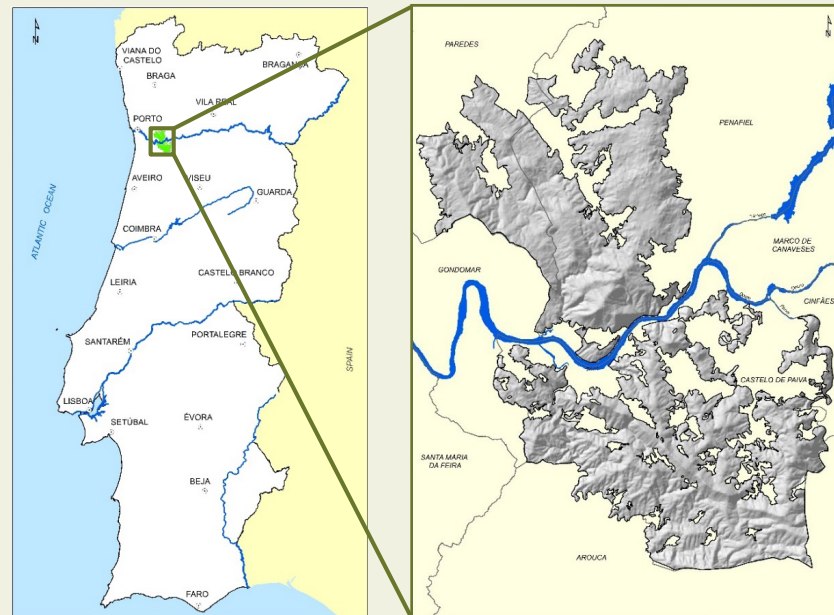
*(CEF / ISA - Universidade de Lisboa)*

*10 - 11 September 2020*




# The Vale do Sousa case study area

- About 14800 ha
- *Eucalyptus* sp.(89%), *Pinus pinaster* Aiton
- Nearly 100% private ownership
- Small-scale stakeholders:
  - poorly informed decisions
  - low impact silviculture practices
- ZIF - forest intervention zones
- Wildfires regime
- Knowledge transfer and capacity building needed!!



# Guidelines development





## Modelos de Gestão Florestal VALE DO SOUSA

FMM1.2

### Eucalipto + Pinheiro bravo

(*Eucalyptus globulus* Labill. & *Pinus pinaster* Aiton)



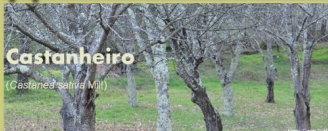



## Modelos de Gestão Florestal VALE DO SOUSA

FMM3

### Castanheiro

(*Castanea sativa* Mill)







## Modelos de Gestão Florestal VALE DO SOUSA

FMM4

### Eucalipto

(*Eucalyptus globulus* Labill.)



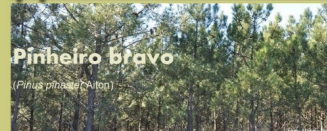


## Modelos de Gestão Florestal VALE DO SOUSA

FMM5


### Pinheiro bravo

(*Pinus pinaster* Aiton)



Uma das formas de gestão da floresta Vale do Sousa são os pavimentos ir pinheiro bravo. As duas espécies são o eucalipto com vista à produção de madeira para serração, sendo o eucalipto cada ciclo (talhada). A sustentabilidade melhorada implementando algumas medidas de pragas e adequação do calendário

| Eucalipto              |  |
|------------------------|--|
| Espaçamento            | 3,5 x 2 m                              |
| Densidade (árvores/ha) | 1400                                   |
| Controlo de matos      | -                                      |
| Desbastes              | -                                      |
| Desbaste de toisa      | 2 rebentos/toisa, em no 3º ano de cada |
| Ciclo de corte/Carte   | 10 a 12 anos                           |




## Modelos de Gestão Florestal VALE DO SOUSA

FMM6

### Carvalho-roble


(*Quercus robur* L.)



A produção de carvalho-roble surge como uma boa alternativa de gestão florestal para os solos profundos, férteis e com boa disponibilidade hídrica da região do Vale do Sousa. Propõem-se rotações mais curtas que as tradicionalmente usadas (120 anos), pensando na redução do risco de incêndio e no crescimento do valor atual do rendimento.

Visite o local de demonstração! Lat: 41,141565; Lon: -8,351415

| Carvalho-roble         |   |
|------------------------|---|
| Espaçamento            | 3 x 2 m   |
| Densidade (árvores/ha) | 1600  |
| Controlo de matos      | a cada 5 anos                                   |
| Podas                  | 23 anos   |
| Desbastes              | pré-comercial 18-22 anos                        |
|                        | 25-29, 35-39 e 43-47 anos, dependendo da altura |
| Corte                  | 40 a 60 anos                                    |




## Modelos de Gestão Florestal VALE DO SOUSA

FMM7

### Sobreiro


(*Quercus suber* L.)



Da crescente procura de matéria prima para a indústria da cortiça e das expectativas de alteração climática, surge a possibilidade de introdução do sobreiro como modelo de gestão florestal para a região do Vale do Sousa. Esta espécie ocorre espontaneamente na região, em áreas abandonadas ou marginais.

Visite o local de demonstração! Lat: 41,118871; Lon: -8,391891

| Sobreiro               |   |
|------------------------|---|
| Espaçamento            | 3 x 2 m                                 |
| Densidade (árvores/ha) | 1600                                    |
| Controlo de matos      | a cada 5 anos                           |
| Desbastes              | pré-comercial 15 anos                   |
|                        | 30, 40, 50 e 76 anos                    |
| Desortigamentos        | 30 e 40 anos, seguindo-se a cada 9 anos |




## Modelos de Gestão Florestal VALE DO SOUSA


FMM8

### Espécies ripícolas

(Zonas de conservação)



Junto aos cursos naturais de água da região do Vale do Sousa é comum encontrarem-se faixas de comunidades de plantas de diversas espécies espontâneas, típicas dos ecossistemas ripários. O estrato arbóreo aparece normalmente dominado por *Alnus glutinosa*, *Salix atrocinerea*, *Salix alba*, *Fraxinus angustifolia*, *Populus nigra*, entre outras. Propõe-se a conservação destas áreas com o intuito de promover a sustentabilidade destes ecossistemas, cujos serviços incluem a conservação de habitats e da biodiversidade, a conservação e filtração da água, o controlo de cheias e a estabilização das margens dos cursos de água. Medidas de proteção e restauro destes ecossistemas poderão ser ainda úteis para cumprir requisitos de certificação florestal.

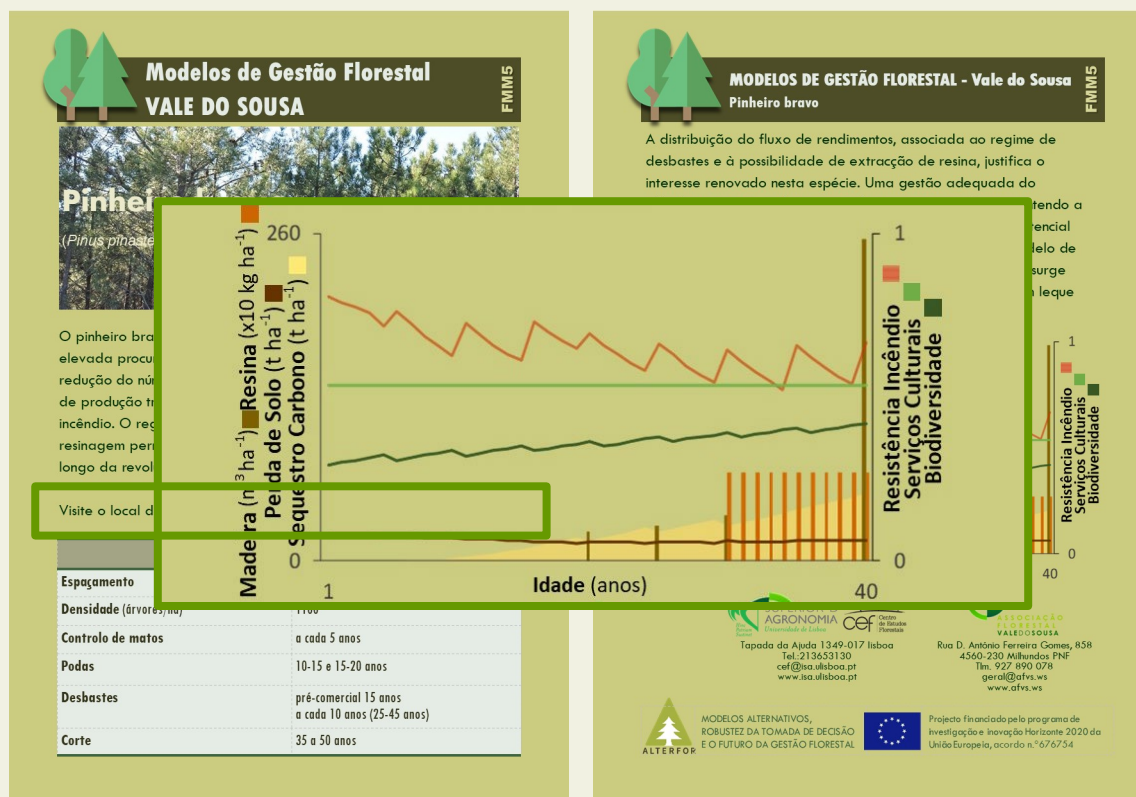


suros surge como resposta à parte da indústria. Propõe-se uma antação, relativamente ao sistema ativo de reduzir o risco de aposto e a possibilidade de de rendimento mais regular ao

41,117449; Lon: -8,374386

| bravo                       |  |
|-----------------------------|--|
| 3 x 3 m                     |  |
| 1100                        |  |
| a cada 5 anos               |  |
| 10-15 e 15-20 anos          |  |
| pré-comercial 15 anos       |  |
| a cada 10 anos (25-45 anos) |  |
| 35 a 50 anos                |  |

# Guidelines development



# Demonstration sites and dissemination

- Guidelines printed and distributed to stakeholders
- Guidelines available online - ISA/CEF and AFVS websites
- Demostration sites location and short description on Google Maps
- Work in progress...

THANK YOU FOR YOUR  
ATTENTION!

---

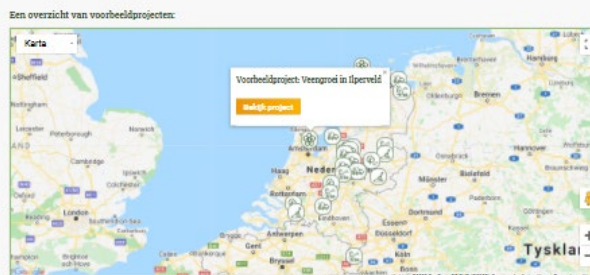


# Demonstration sites

## How to find them?



- Maps
- Web-sites
- On-line platforms
- Workshops etc.
- Facebook and other social media



|  |  |
|--|--|
| <ul style="list-style-type: none"> <li>Voorbeeldproject: Bosreservaat 't Leesten</li> <li>Voorbeeldproject: Kippensuikloop in Almen</li> <li>Voorbeeldproject: Stimuleren veenjonging Elzabethbosch</li> <li>Voorbeeldproject: Wierpbeplanting langs de N347</li> <li>Voorbeeldproject: Schietateller Heesmeer</li> <li>Voorbeeldproject: Bosreservaat Tongerse Hei</li> <li>Voorbeeldproject: Walvuten en Ionen Ethen-Leur</li> <li>Voorbeeldproject: Veenrooi in IJssveld</li> <li>Voorbeeldproject: Essenomvorming Hollandse Hout</li> <li>Voorbeeldproject: Kwalderherstel Griend</li> <li>Voorbeeldproject: Biomassateelt Waterbeving Hollands Delta</li> <li>Voorbeeldproject: BioBlocks</li> <li>Voorbeeldproject: Stimuleren veenjonging Rheden</li> </ul> | <ul style="list-style-type: none"> <li>Voorbeeldproject: Kippensuikloop in Dreumel</li> <li>Voorbeeldproject: Stimuleren veenjonging Welkomse Zand</li> <li>Voorbeeldproject: Inzamelstelsel Wierden</li> <li>Voorbeeldproject: Biomeler in Voersmaal</li> <li>Voorbeeldproject: Bosreservaat Pipebrandje</li> <li>Voorbeeldproject: Bosreservaat Lierbroek</li> <li>Voorbeeldproject: Herstel Leuvenumse beek</li> <li>Voorbeeldproject: Essenomvorming Sidsbeuren</li> <li>Voorbeeldproject: Kwalderherstel Pezumelannen</li> <li>Voorbeeldproject: Stimuleren veenjonging Roonbroeve</li> <li>Voorbeeldproject: Biomassateelt als bodemverbeteraar</li> <li>Voorbeeldproject: Bos langs A18 Varsoeveld</li> </ul> |
|--|--|



Contact:  
Over deze site  
Privacy statement  
Klimaatatlas.nl

Klimaatatlas Boven- en Natuurbeheer © 2020 / Berghuis - The Online Performance



Kas vyksta miške

June 19 at 9:59 AM ·

ad ir kaip apmaudu pripažinti, praeityje didžiausią ieškos paslauga ažuolams padarė pats žmogus, ertant plynai iškirsti pavieniai ar grupėmis augę žuolai. O pastaraisiais dešimtmečiais ligos, anopiniai žvėrys, sunaikino nemažai ažuolų ar jų avaiminukų. Siekiant formuoti įvairiaamžius ir įrtingus biologine įvalrove medynus, kertant lynai kirtavietėje palikti nebrandūs ažuolai. irtavietė atkurta 7A3E, atvirose vietose grupėmis asodinti ažuoliukai, o po likusiais ažuolais glutės.

ALTERFOR  
w.alterfor-project.eu



### APUOČIŲ PLOTŲ DIDINIMAS

ad ir kaip apmaudu pripažinti, praeityje didžiausią meškos paslauga uolams padarė pats žmogus, kertant ynai iškirsti pavieniai ar grupėmis agę ažuolai. O pastaraisiais šimtmečiais ligos, kanopiniai žvėrys, naikino nemažai ažuolų ar jų vaiminukų. Siekiant formuoti airiaamžius ir turtingus biologine airove medynus, kertant plynai rtavietėje palikti nebrandūs ažuolai. rtavietė atkurta 7A3E, atvirose etose grupėmis pasodinti ažuoliukai, po likusiais ažuolais eglutės.



Palikti kirtavietėje ažuolai



Jaunoji karta

#### Patirtimi pasidaliję:

Saulius Austrevičius, 27 m, darbo patirties valstybinių miškų (monėje (arėdijoje), Taurapės RP Miškas augimo specialistas Kontaktinė informacija: 84 6661067, el.p. saulius.austrevicius@vmm.lt

#### Patys galite įsikišti:

Pavyzdys aptariamos vietovės adresas: Koordinatės: 62°30'11", 15°22'41"

Es projektas yra finansuojamas iš Europos Sąjungos lėšų Europos regioninės plėtros programos 2014-2020 m. lėšų išmokomis 670754



59

People Reached

4

Engagements

Boost Post

out one of the demo sites in Facebook group "Kas vyksta miške"

# DEMONSTRATION OF FOREST MANAGEMENT MODELS WHICH DO NOT EXIST YET: LITHUANIAN CASE

---

*ALTERFOR Final Conference*

*“STAND, LANDSCAPE, CONTINENT – EUROPEAN FORESTS FOR  
MULTIPLE BENEFITS AT MULTIPLE SCALES”*

10-11 September 2020



# Forestry in Lithuania nowadays

Struggle between the traditional silvicultural focus on maximizing **sustainable timber production** and increasing attention on **environmental and social values**

## Doubled the forest harvesting

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

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

Acceptance of international environmental standards  
Joining the EU  
“Greening” of society



# Forestry in Lithuania nowadays

Nevertheless, forest management system still much based on approaches originating from the 19<sup>th</sup> century, matured under conditions of socialistic economy:

Classical theory of normal forests, strict rotation ages and area control of age classes...

But most important - **command & control forest governance**

Key question: do we need innovations?

If yes, how to implement new approaches:

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

On the other hand:

Public = the only forestry expert = **always right**

# The role of aFMM demo

To demonstrate both sides (i.e. forestry experts and public) that:

New ideas regarding the forestry may be explained, substantiated, demonstrated and discussed...

Absolutely sure, that new ideas need to be communicated in a way, to be perceived by both “expert” groups:

- Forestry bureaucrat
- Public

The aFMMs are in fact vision of enhanced forest management **which may not be implemented physically assuming that they contradict current forestry principles and legislation**

# Alternative forest management models 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



**ADAPTIVE ROTATION AGES**

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



**CARE FOR DECIDUOUS**

Objectives: to look more “green” in the eyes of environmental fundamentalists (???)



**POTENTIAL EU HABITATS**

# The solutions used by ALTERFOR team in Lithuania

Virtual demo sites to promote the ideas beyond current forestry:

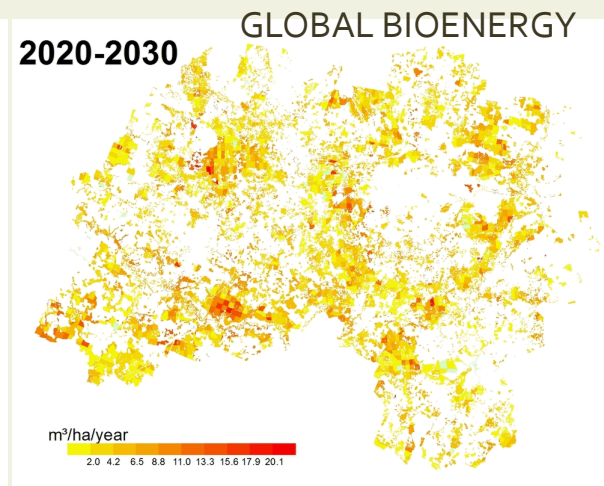
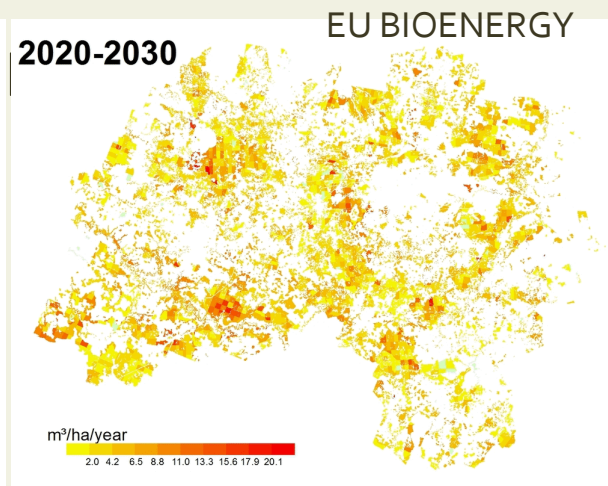
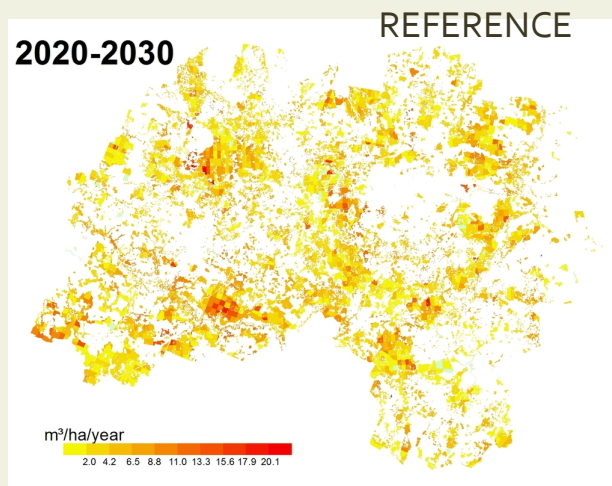
- Developed by researchers
- Communicated to researchers, decision makers and (partly) to practical foresters and the public
- Via traditional tools (presentations, publications)

Collections of “best forestry practices” to communicate advanced forestry solutions, which have been already implemented:

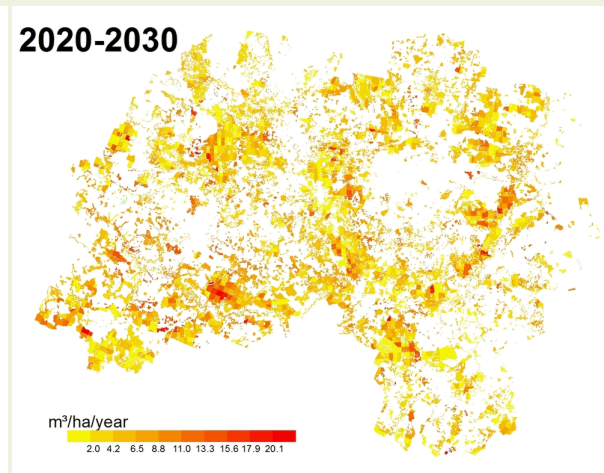
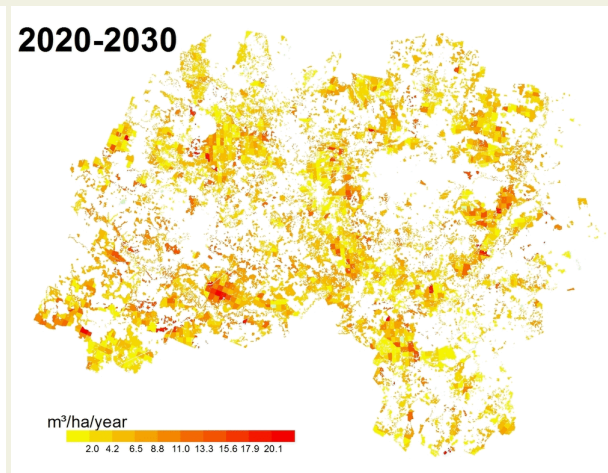
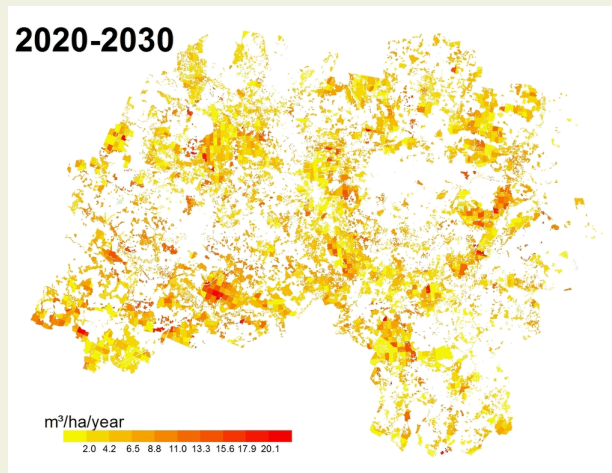
- Developed by practical foresters
- Communicated to everyone, but first to the practical foresters and public
- Via social networking

# Virtual sites: some attempts to visualize the development of ES under aFMMs

Current FMMs



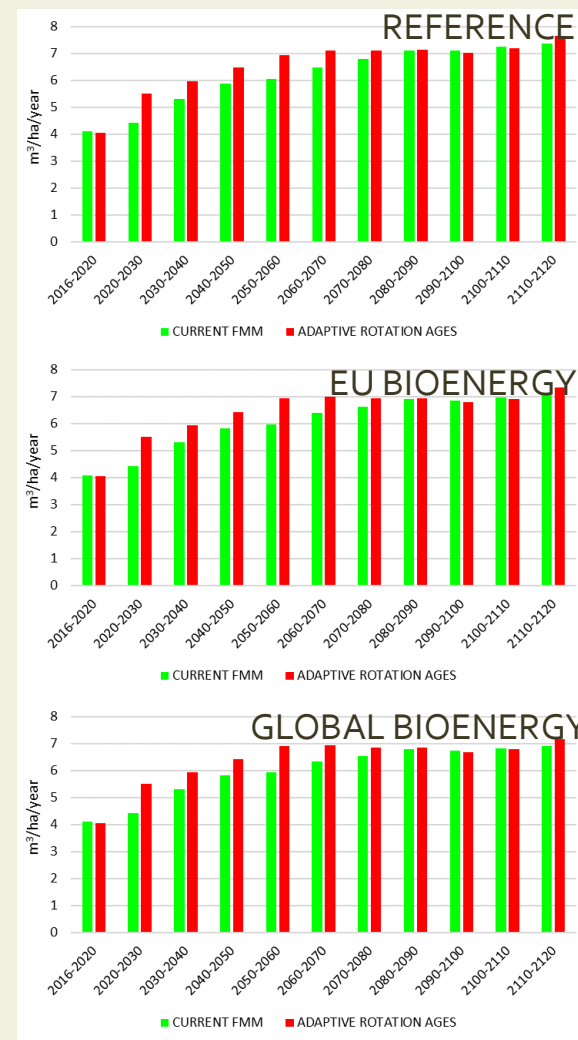
Adaptive rotation ages



Volume of annually harvested timber, m³/ha/year

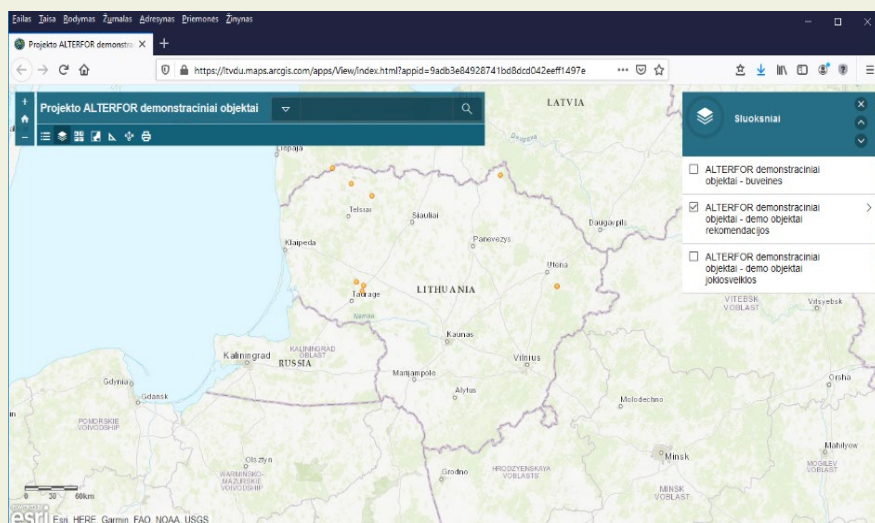
# Virtual sites: some attempts to visualize the development of ES under aFMMs

However, the least sophisticated approach works better...



Volume of annually harvested timber, m³/ha/year

# Best forestry practices



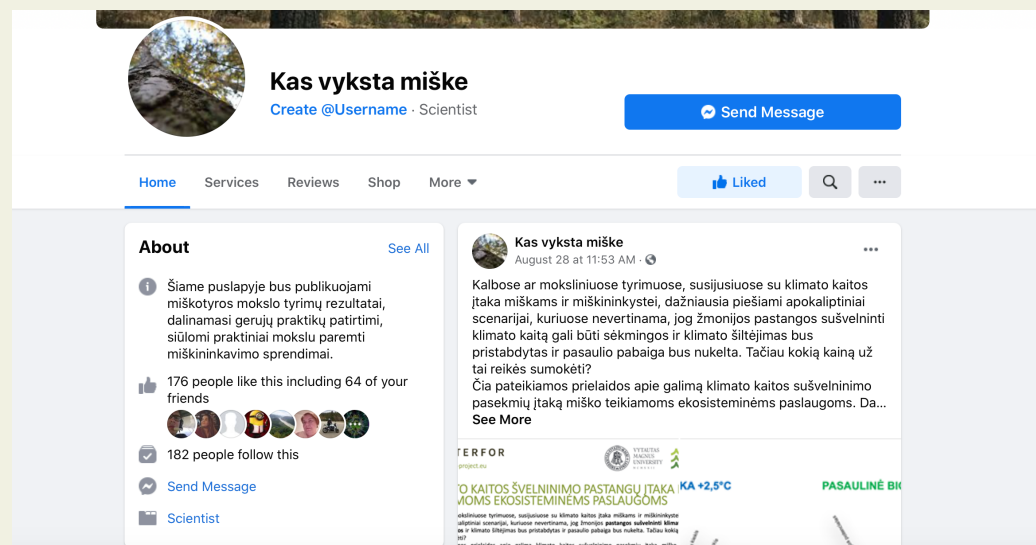
Demo sites with recommendations of external forestry experts on ArcGIS Online



Network of “demo sites” linked to a specific forest compartment

# Demo sites are nice for the specialists, but what about more general public?

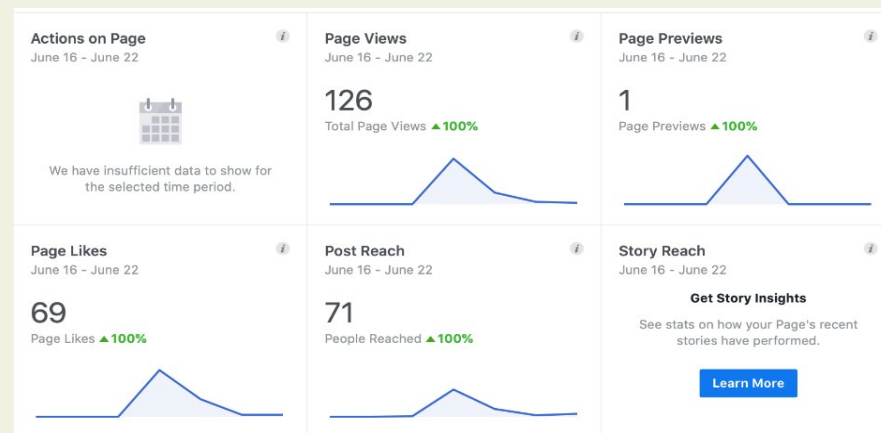
- Modern and easy decision - demonstration on social media.
- The aim of Facebook group is to share the recent forest research results, offer the examples of good practices and practical forest management decisions, based on the scientific data.



Facebook group “What’s going on in the forest”

# Are we getting noticed? Little by little...

- 182 followers, who are coming from forest sector and are forest professionals, private forest owners or decision-making officials.
- At the moment the main content, published in the group, are the Guidelines, prepared for the ALTERFOR project. Further content will be arranged in the same style as these Guidelines.



A screenshot with initial group activity



A post shared by the Foresters' union of Lithuania

# Public involvement? Yes!



www.alterfor-project.eu



VYTAUTAS  
MAGNUS  
UNIVERSITY  
VILNIXII



Valstybinių  
miškų  
urėdija

## MIŠKO ATKŪRIMAS

Tauragės regioniniame padalinyje vyrauja derlingos Lc augavietės. Apie 80 proc. kirtaviečių šioje augavietėje Tauragės miškininkai atkuria eglynais mišrindami su pušimi ąžuolais ir juodalksniais. Dažniausiai taikoma mišrinimo schema 7E3P mišrinama eilėmis ir 6E3P1A) eglė su pušimi ir ąžuolu mišrinama eilėmis ar eilėse, juodalksnis grupėmis. Manome, kad brandos amžiuje tokie medynai bus patys našiausi ir jų turis siektų 400 – 500 ktm/ha. ąžuolas mišrinamas ten kur motininiam medyne nebuvo ąžuolo.

**Patirtimi pasidalijo:**



Saulius Austrevičius. 27 m. darbo patirties valstybinių miškų įmonėje (urėdijoje), Tauragės RP Miško auginimo specialistas  
Kontaktinė informacija:  
844661067, el.p. saulius.austrevicius@vmu.lt

**Patys galite įsitikinti:**



Pavyzdyje aptariamos vietovės adresas:  
Koordinatės: E22°28'27", N55°19'37"




Šis projektas yra finansuojamas Europos Sąjungos tyrimų ir inovacijų programos Horizontas 2020, sutarties numeris 676754



*Eglės-pušies želdiniai*



*Pribręstantis eglynas su pušimi*



Lietuvos miškininkų sąjunga - LMS  
August 6 •

Tauragės miškininkai dalinasi miškų atkūrimo patirtimi

[Show Attachment](#)


2 2 Comments

Like Comment Share

Most Relevant


Comment as Kas vyksta miške

Press Enter to post.



**Stasė Stasytė**  
Mačiau šiuos želdinius. Prisipažinsiu, iš pradžių vertinau šiek tiek skeptiškai, bet įsigilinus patiko. Visai neseniai ir mokslinėje literatūroje skaičiau teigiamus atsiliepimus apie šį gal kiek neįprastą mišrinimo būdą. Džiaugiuosi, kad girininkas dalinasi savo patirtimi.

Like · Reply · 4w



**Stasė Stasytė**  
Pagarbiai

Like · Reply · 4w

Positive comments by wider public

Example of good practices, described by VĮVMU specialist

# HOW TO REACH THE FOREST STAKEHOLDERS – CASE SLOVAKIA



---

**Róbert Sedmák, Ján Tuček, Ján Bahýľ, Michal Bošela, Yvonne  
Brodrechtová, Juraj Čerňava, Marek Fabrika**

*Technical University in Zvolen, Faculty of Forestry, Department of Forest  
Resource Planning and Informatics*

*11/09/2020*



# How to reach the forest stakeholders in Slovakia

Five main channels will be/are utilized

1. **Demonstration sites (excursions)**
2. **Growth simulations of representative stands**
3. **Time travelling in virtual forest**
4. **Web page hosted by Technical University**
5. **Inclusion into education and dissemination activities**

# How to reach the forest stakeholders – case Slovakia

**Demonstration sites (excursions) – classic experimental plots – practical examples provided by long-term plots in the field**

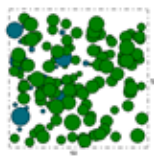

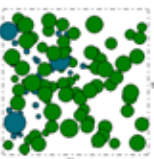
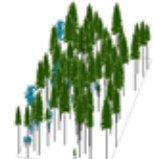
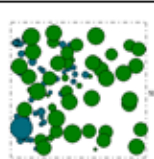

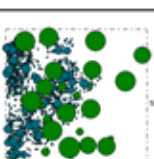
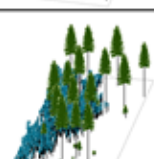
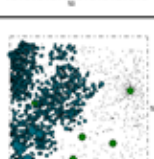

## **Example – More flexible even-aged forestry**

Series of plots established in **even-aged stands with different ages** = establishment of series of experimental plots in mature stands with different age

# How to reach the forest stakeholders – case Slovakia

Growth simulations of representative forest stands – calculations visualized by graphic model of growth simulator Sibyla – presentations of expected theoretical development



| Research plot No. 1  | Visualization   |   |
|--|---|---|
| <b>1<sup>st</sup>. Decade</b><br>Age of stand: 85 years<br>Tree species composition:<br>spruce 97%, beech 3%<br>Volume: 348 m <sup>3</sup> /ha<br>Basal area: 30,8<br>Cut: from above, intensity 30% |    |    |
| <b>2<sup>nd</sup>. Decade</b><br>Age of stand: 95 years<br>Tree species composition:<br>spruce 99%, beech 1%<br>Volume: 292 m <sup>3</sup> /ha<br>Basal area: 24,9<br>Cut: from above, intensity 30% |    |    |
| <b>3<sup>rd</sup>. Decade</b><br>Age of stand: 105 years<br>Tree species composition:<br>spruce 100%<br>Volume: 167 m <sup>3</sup> /ha<br>Basal area: 14,0<br>Cut: from above, intensity 50%         |    |    |
| <b>4<sup>th</sup>. Decade</b><br>Age of stand: 115 years<br>Tree species composition:<br>spruce 100%<br>Volume: 202 m <sup>3</sup> /ha<br>Basal area: 16,8<br>Cut: from above, intensity 100%        |   |   |
| <b>New stand using a model of natural regeneration</b>   |  |  |

## How to reach the forest stakeholders – case Slovakia

**3. Time travelling in virtual forest** – theoretical development of forest structures affected by a new management presented in Virtual Cave facility


**All field plots will be supported by virtual presentations – Virtual cave**

**Two travels in time in 3D virtual stands and/or over the landscape:**

- Transformation from even-aged young stand through differentiated medium-aged forest to selection forest at final phases
- Impacts of more variable rotations on regeneration of even-aged stand and/or landscape forest mosaic within 100 years



# How to reach the forest stakeholders – case Slovakia

4. Web page hosted by Technical University – all supporting information consisting of photos, maps, graphs, tables, guidelines for implementation, discussion section, educational videos, information leaflets about a new management approaches and demonstration sites



ALTERFOR

www.alterfor-project.eu

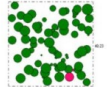

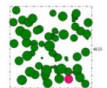

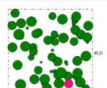

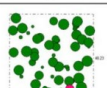

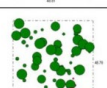






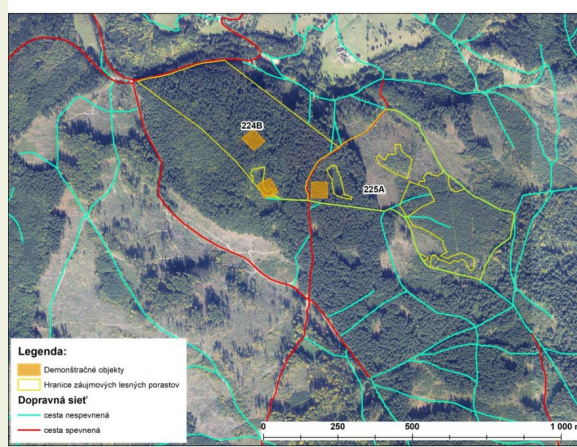
Užívateľská príručka

Pre potreby praktickej realizácie alternatívnych modelov hospodárenia

Authori:  
Ján Bahýľ, Róbert Sedmák, Juraj Čerňava, Ján Tuček

Technická univerzita vo Zvolene, 2020

| Výskumná plocha č. 3  | VIZUALIZÁCIA  |   |
|---|---|---|
| Vek porastu: 100 rokov<br>Zastúpenie drevín: smrek 98%, smrekovec 2%<br>Zásoba: 509 m <sup>3</sup> /ha, Kruhová základňa: 35,7, Zásah: cieľová hrúbka 60 cm |    |    |
| Vek porastu: 110 rokov<br>Zastúpenie drevín: smrek 98%, smrekovec 2%<br>Zásoba: 510 m <sup>3</sup> /ha, Kruhová základňa: 35,7, Zásah: cieľová hrúbka 60 cm |    |    |
| Vek porastu: 120 rokov<br>Zastúpenie drevín: smrek 97%, smrekovec 3%<br>Zásoba: 398 m <sup>3</sup> /ha, Kruhová základňa: 28,2, Zásah: cieľová hrúbka 60 cm |    |    |
| Vek porastu: 130 rokov<br>Zastúpenie drevín: smrek 97%, smrekovec 3%<br>Zásoba: 364 m <sup>3</sup> /ha, Kruhová základňa: 25,9, Zásah: cieľová hrúbka 60 cm |   |   |
| Vek porastu: 140 rokov<br>Zastúpenie drevín: smrek 98%, smrekovec 2%<br>Zásoba: 425 m <sup>3</sup> /ha, Kruhová základňa: 30,1, Zásah: úrovňový, sila 100%  |  |  |
| Následný porast s využitím modelu prirodzenej obnovy  |  |  |



**Legenda:**

- Demonstračné objekty
- Hranice záujmových lesných porastov

**Dopravná sieť**

- cesta neaspevnená
- cesta aspevnená

0 250 500 1 000 m

## TARGETED STAKEHOLDERS

| Group   | Main channels  |
|---|--|
| Licenced forest managers for state, municipal, communal or private entities<br>Planning agencies  | Demonstration plots, Simulations, Workshops                            |
| Forest owners and their associations  | Webpage, Simulations , Virtual time travel                             |
| State forestry administration<br>Nature conservation specialists  | Demonstration plots, Simulations, Workshops                            |
| Scientists interested in forestry and ecology<br>Forestry and ecology students  | Lectures, Workshops, Webpage, Demonstration sites, Virtual time travel |
| Local stakeholders – local inhabitants, enterpreneurs, companies related to recreation and water-related services, ...<br>Public - NGOs, school teachers, pupils, citizens, tourists, hunters ... | Virtual time travel, Webpage, Demonstration sites                      |

## Pros and coins

| Channel                     | Pros   | Coins   |
|-----------------------------|--|---|
| Demostration sites          | The most accurate<br>Attractive<br>Tangible  | Long term<br>High costs<br>Potentially affected by hazards                  |
| Simulations                 | Results obtained within minutes<br>Attractive for younger people<br>Great analytic potential | Potentially biased<br>Loaded by random errors                               |
| Virtual time travel         | Easily imaginable<br>Very attractive   | Only for promotion<br>Very high investment cost<br>Time and staff demanding |
| Web page                    | Low cost<br>Exhaustible and effective  | Study effort demanding  |
| Education and Dissemination | Hgely effective<br>Interactive<br>Understandable   | Limited impact<br>Time and expert demanding                                 |