Demonstration areas of near-natural forest management and

initiatives to motivate forest owners to promote biodiversity in Austria.

Dr. Georg Frank

Austrian Forest Research Institute

Luxembourg, 04-10-2023

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Initial situation and background

- long **tradition** of forests managed by age class system

    - Plenty of experimental plots for thinning experiments, provenence research etc.

- **continious cover forests** are still a side issue

    - hardly any permanent research plots in unevenaged forests

- **Pro Silva Austria -** a network for continious cover forestry pioneers and forest enterprises

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Initial situation and background

Need for:

- specific scientific evaluation of continious cover forest enterprises and forest sites as **best practice examples** and **study objects**

  -Permanent observation plots
  -Demonstration areas

- **Key figures and indicators** for close-to-nature-forestry

  -Forest growth – economic efficiency
  -Biodiversity – nature conservation
  -Selection of suitable tree species – climate change

-→ **Initiation of the ResynatWald– project by Pro Silva Austria**

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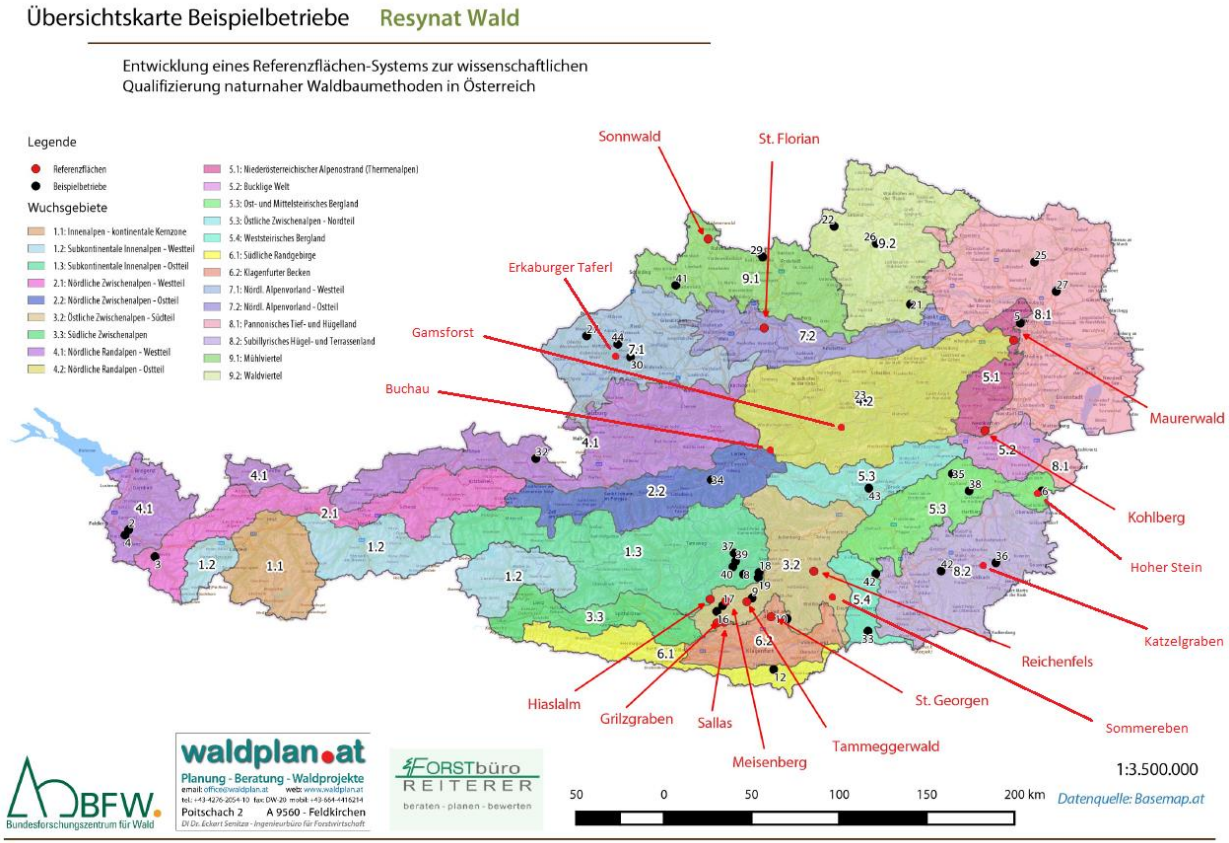
-→ **Initiation of the ResynatWald–project by Pro Silva Austria**

-ResynatWald
-(2014 – 2016)

-ReSynatWald 2.0 – Forest Integrate Austria
-(2019 – 2022)



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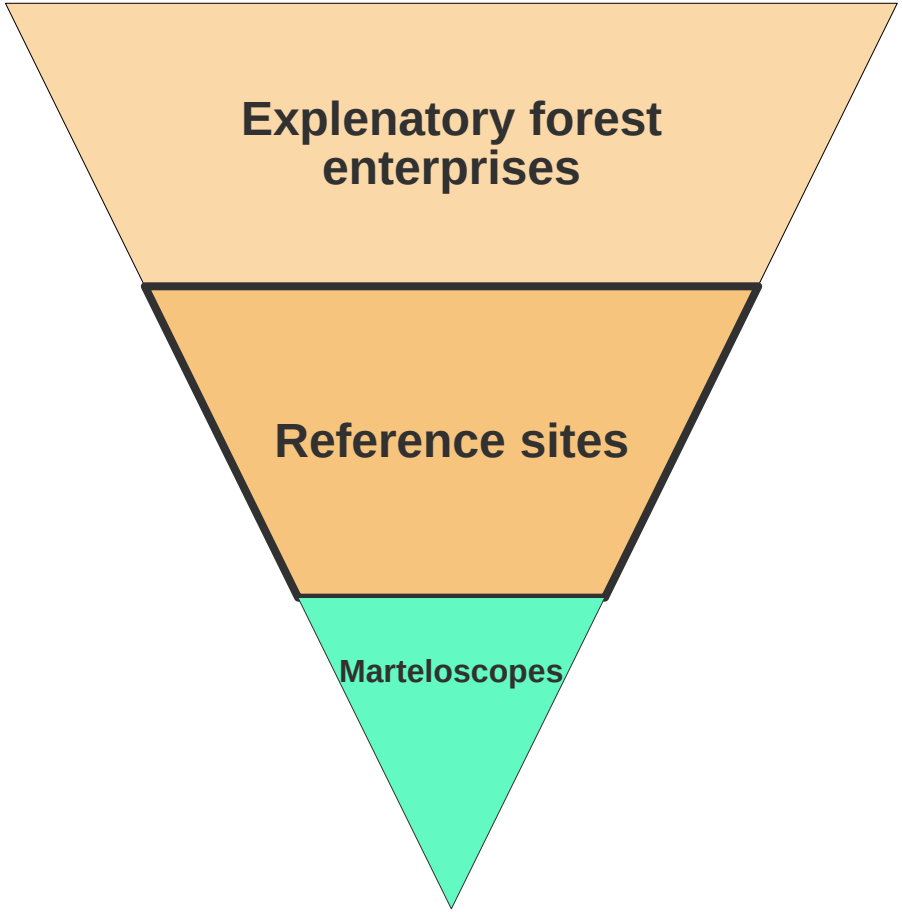
Basic idea

- Identification of suitable **best practice forest enterprises** working with continious cover forestry

  (Pro Silva Austria members)

- Establishment of **reference sites** as permanent observation areas

- Establishment of **demonstration sites** for modelling, workshops and tree selection excercise



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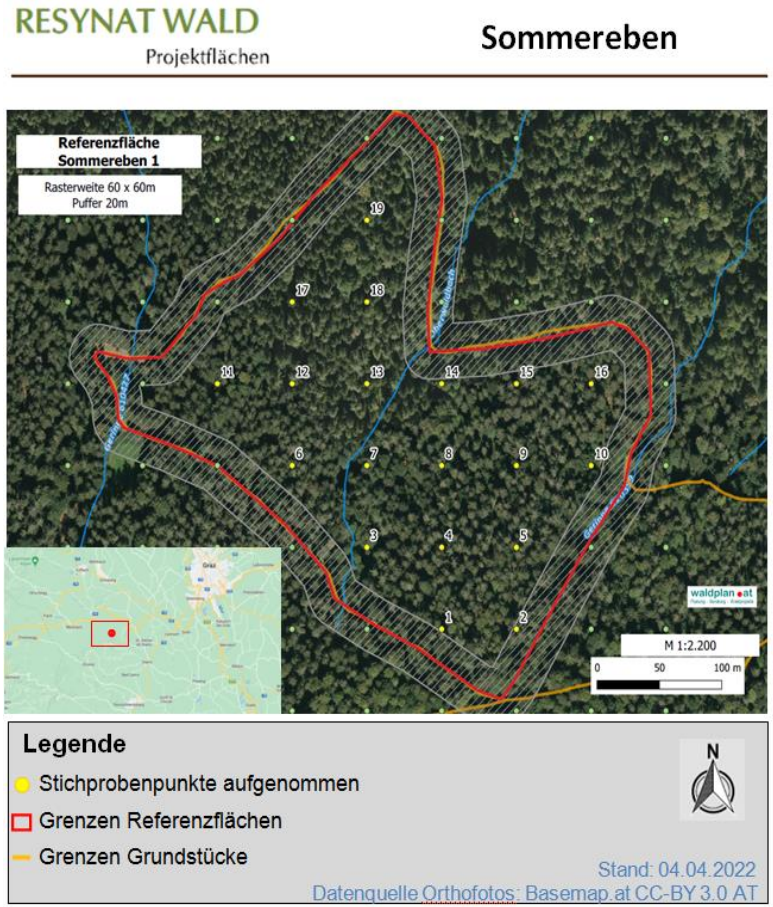

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Research aims

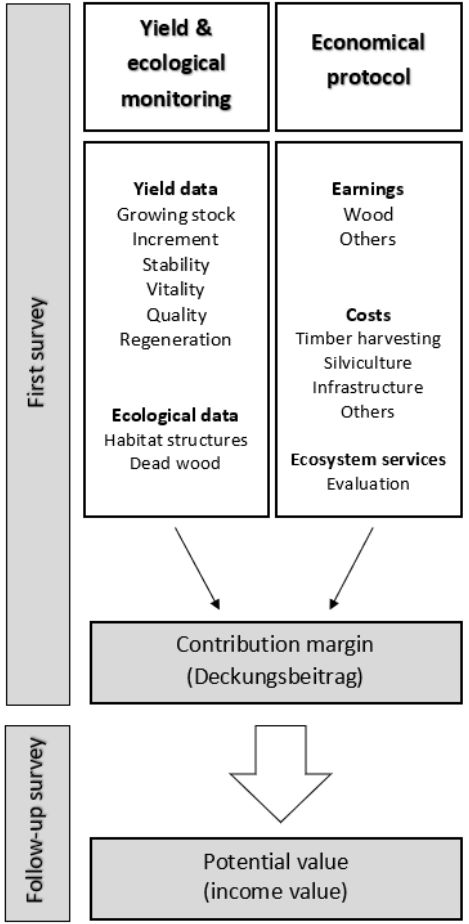
Forest growth and structure analysis

Ecological monitoring

Economic protocol

Benefits of close-to-nature silviculture

Costs of nature conservation in forests



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Moduls

Forest growth and structure analysis

- Determination of the forest community and the naturalness of the vegetation
- Biometrical survey – angle count sampling, circular plot sampling
- Regeneration – satellite sampling, browsing survey
- Tree stability criteria – h/d, crown-dimension

Ecological monitoring

- Deadwood survey – standing and laying, rootstocks
- Tree related microhabitats

Economic monitoring

- Economic protocol (yearly)

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Forest community	Vaccinio myrtilli-Pinetum sylvestris		Calamagrostio villosae-Piceetum	
Ground	Silicate		Silicate	
Growth region	5.1		3.2	
Sea level	640-708		1140-1260	
Area [ha]	9,65		5,09	
N/ha	**279**	±35	**297**	±55
BA [m^2/ha]	**22,9**	±1,9	**33,1**	±2,4
Volume [m^3/ha]	**243**	±23	**500**	±41
iBA [m^2/ha/year]	0,3		0,2	
iV [m^3/ha/year]	3,0		4,1	

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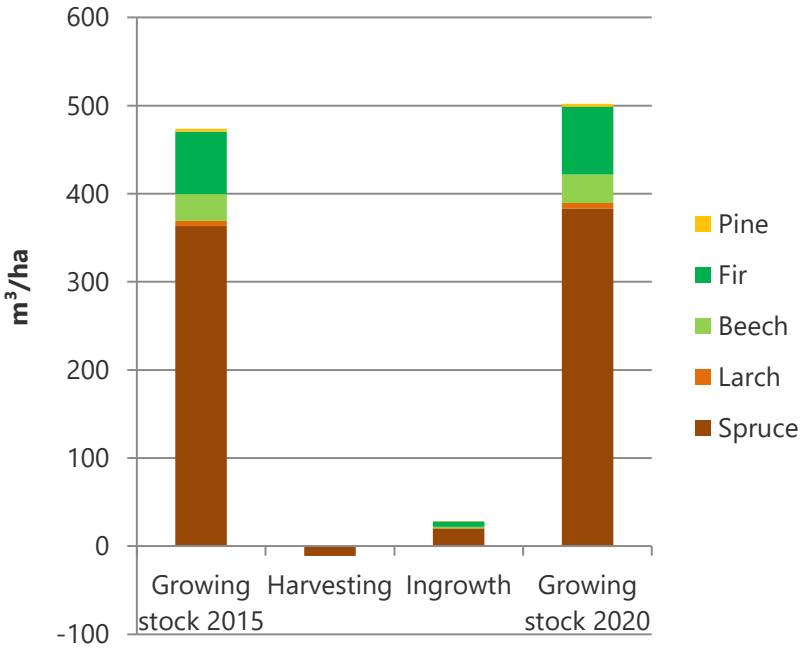
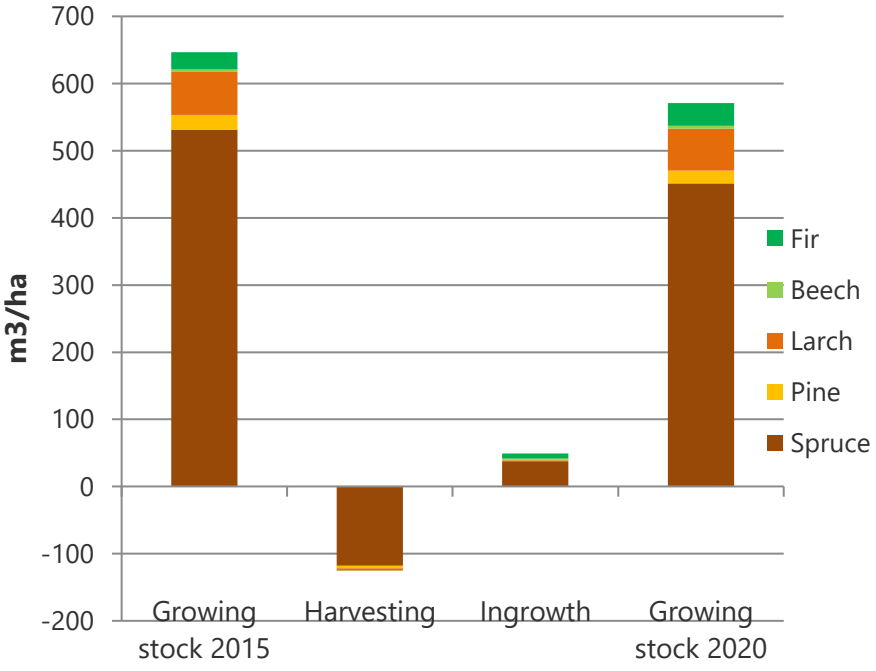
Repeated Surveys





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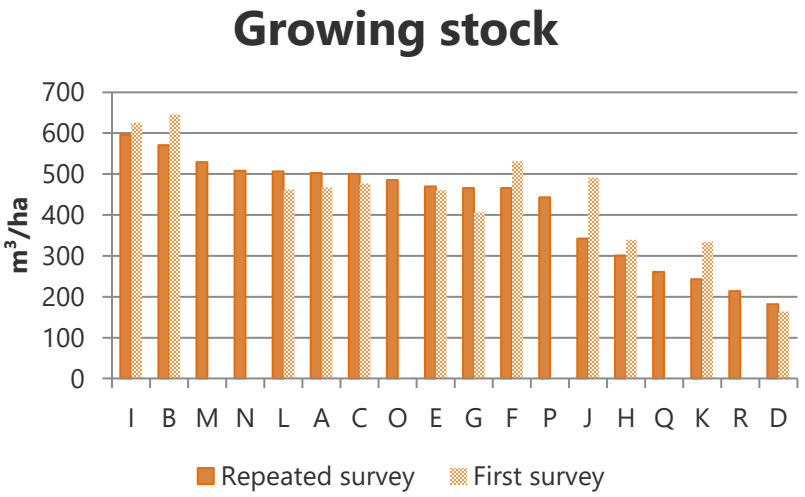
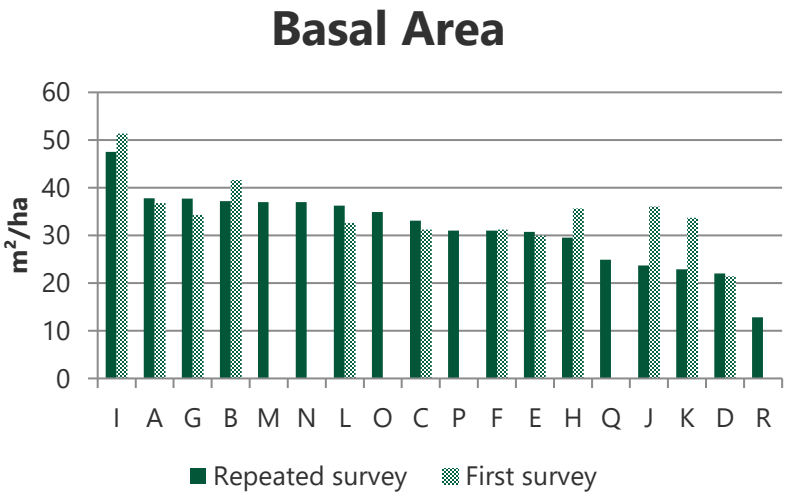
Repeated Surveys





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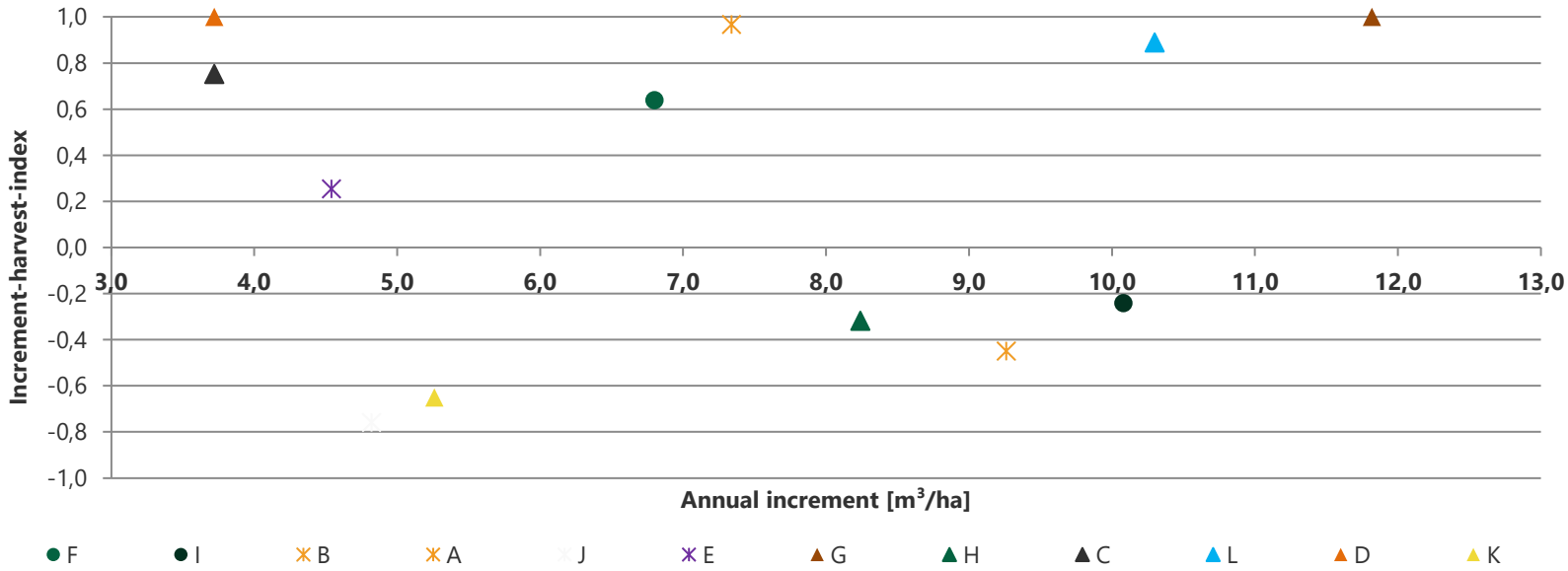
$$Increment - harvest - index = \frac{(V_{t-n} + i_n - V_t) - (V_t + h_n - V_{t-n})}{(V_{t-n} + i_n - V_t) + (V_t + i_n - V_{t-n})}$$

$$= \frac{(i_n - h_n)}{(i_n + h_n)} \quad [-1 < I < 1]$$

V_t = *Growing stock at period end*
V_{t-n} = *Growing stock at period start*
i_n = *Increment over period (ingrowth + volume increment)*
h_n = *Harvesting volume in the period*
n = *Period length in years*



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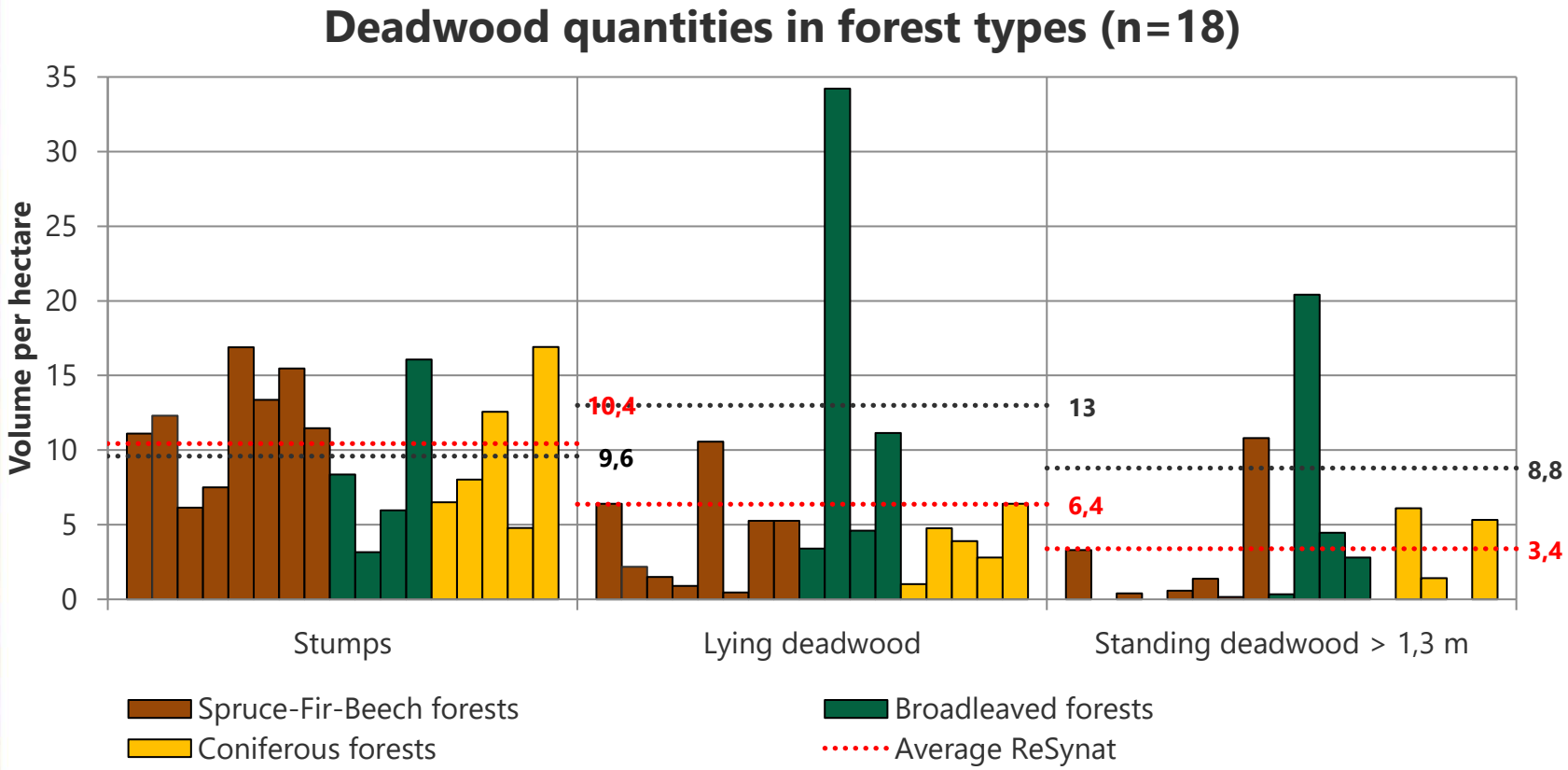

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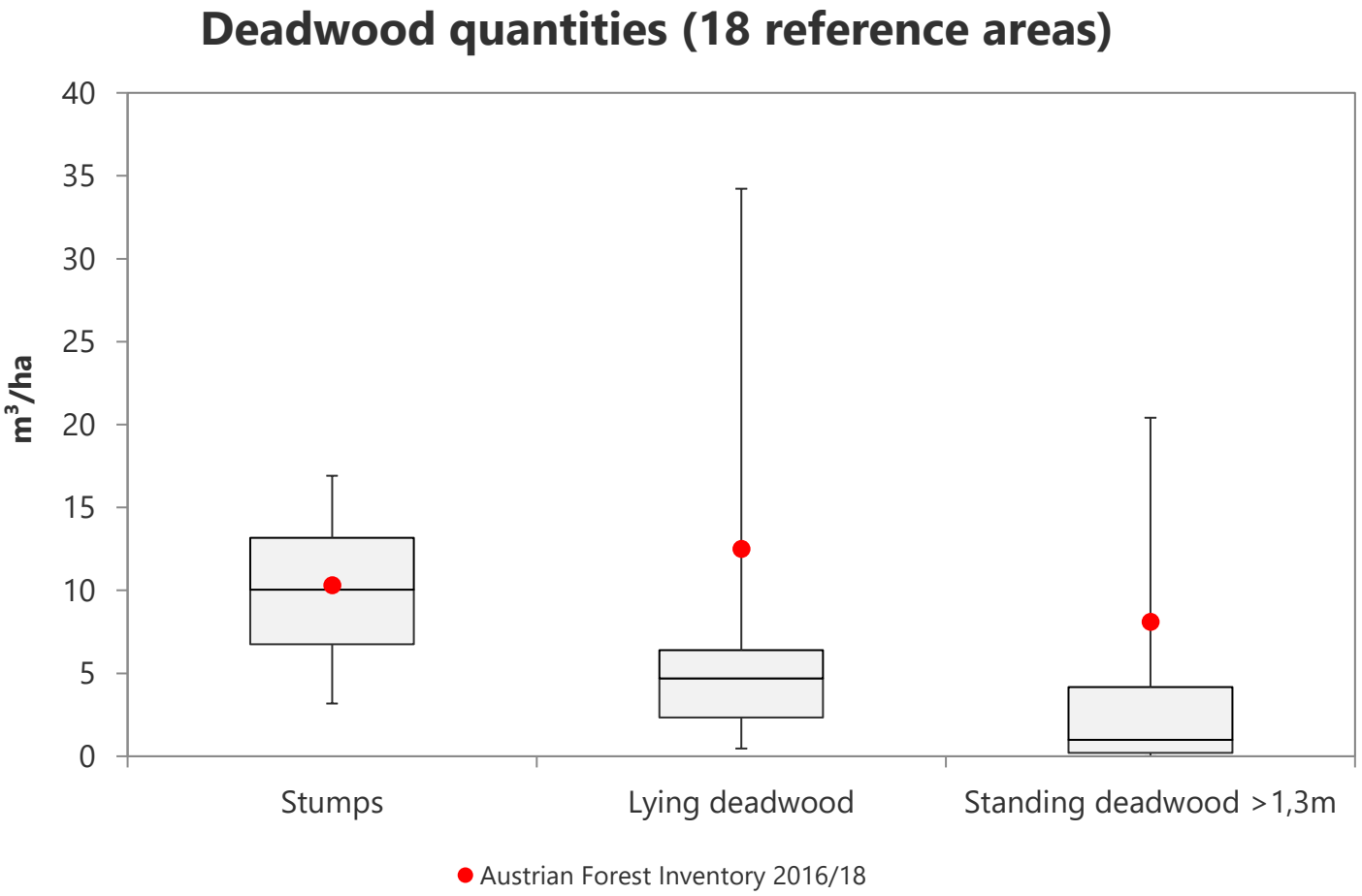

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TreMs (tree-related Microhabitats)

TreMs are nearly undetectable

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Economic monitoring

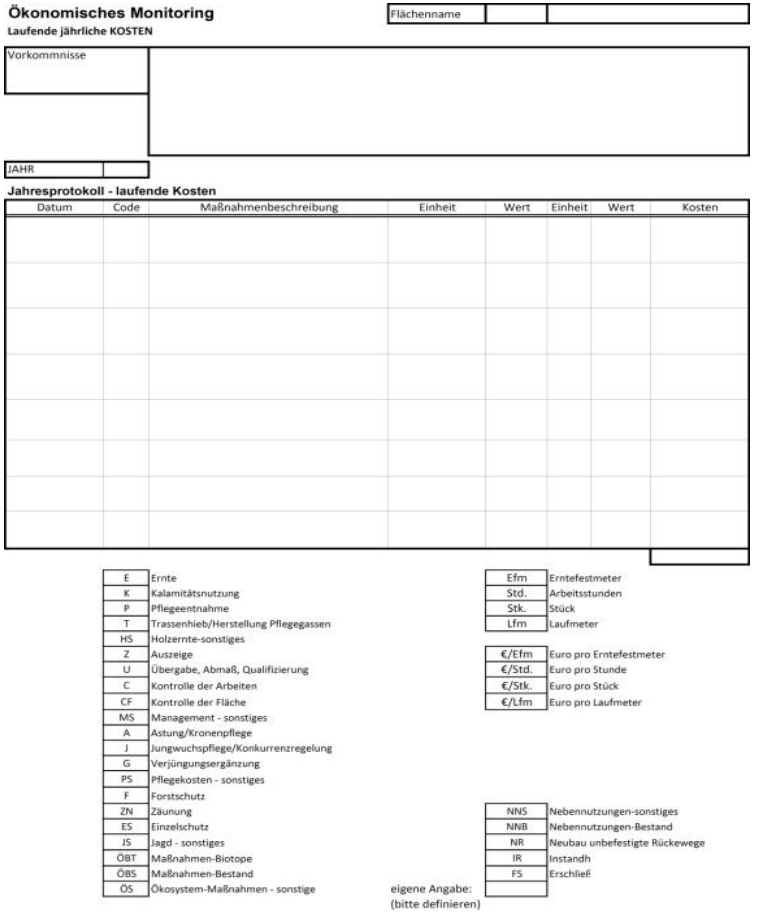
- Owners of the sites maintain continious records on the earnings and expenses on the reference sites

Earnings e.g

-timber harvesting
-other income (hunting etc.)
-other non-wood-forest products
-subsidies (e.g. habitat trees)

Expenses e.g.

- harvesting costs
- tending activities
- cost for tree marking
- protection against browsing
- quality control



Ökonomisches Monitoring
Laufende jährliche KOSTEN

Flächenname		

Vorkommnisse	

JAHR	

Jahresprotokoll - laufende Kosten

Datum	Code	Maßnahmenbeschreibung	Einheit	Wert	Einheit	Wert	Kosten

E	Ernte
K	Kalamitätsnutzung
P	Pflegeentnahme
T	Trassenhieb/Herstellung Pflegegassen
HS	Holzernte-sonstiges
Z	Auszeige
U	Übergabe, Abmaß, Qualifizierung
C	Kontrolle der Arbeiten
CF	Kontrolle der Fläche
MS	Management - sonstiges
A	Astung/Kronenpflege
J	Jungwuchspflege/Konkurrenzregelung
G	Verjüngungsergänzung
PS	Pflegekosten - sonstiges
F	Forstschutz
ZN	Zäunung
ES	Einzelschutz
JS	Jagd - sonstiges
ÖBT	Maßnahmen-Biotope
ÖBS	Maßnahmen-Bestand
ÖS	Ökosystem-Maßnahmen - sonstige

Efm	Erntefestmeter
Std.	Arbeitsstunden
Stk.	Stück
Lfm	Laufmeter

€/Efm	Euro pro Erntefestmeter
€/Std.	Euro pro Stunde
€/Stk.	Euro pro Stück
€/Lfm	Euro pro Laufmeter

NNS	Nebennutzungen-sonstiges
NNB	Nebennutzungen-Bestand
NR	Neubau unbefestigte Rückewege
IR	Instandh
FS	Erschließ

eigene Angabe:
(bitte definieren)

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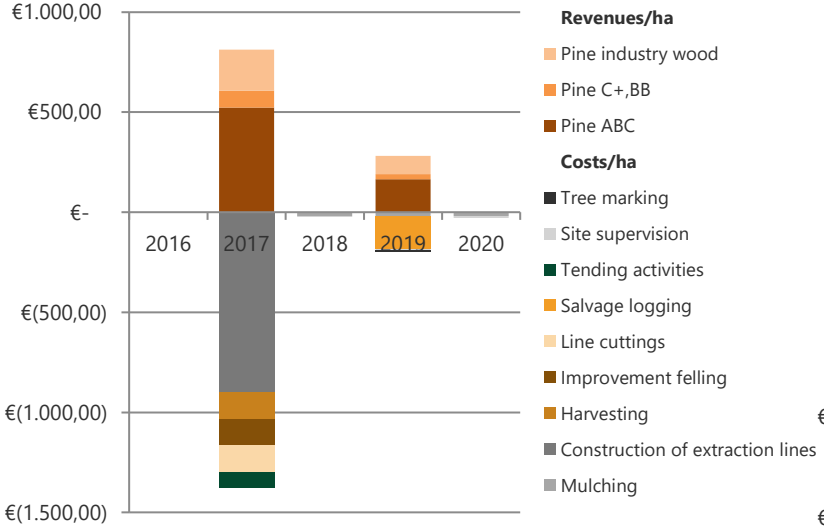

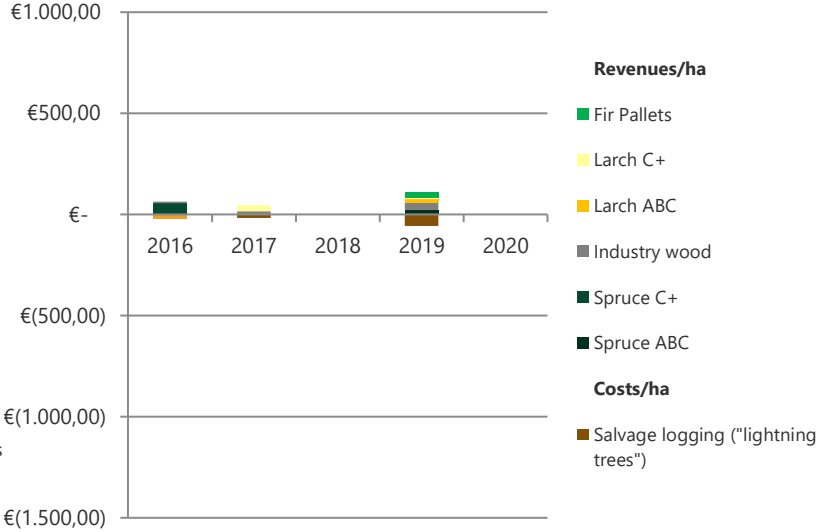

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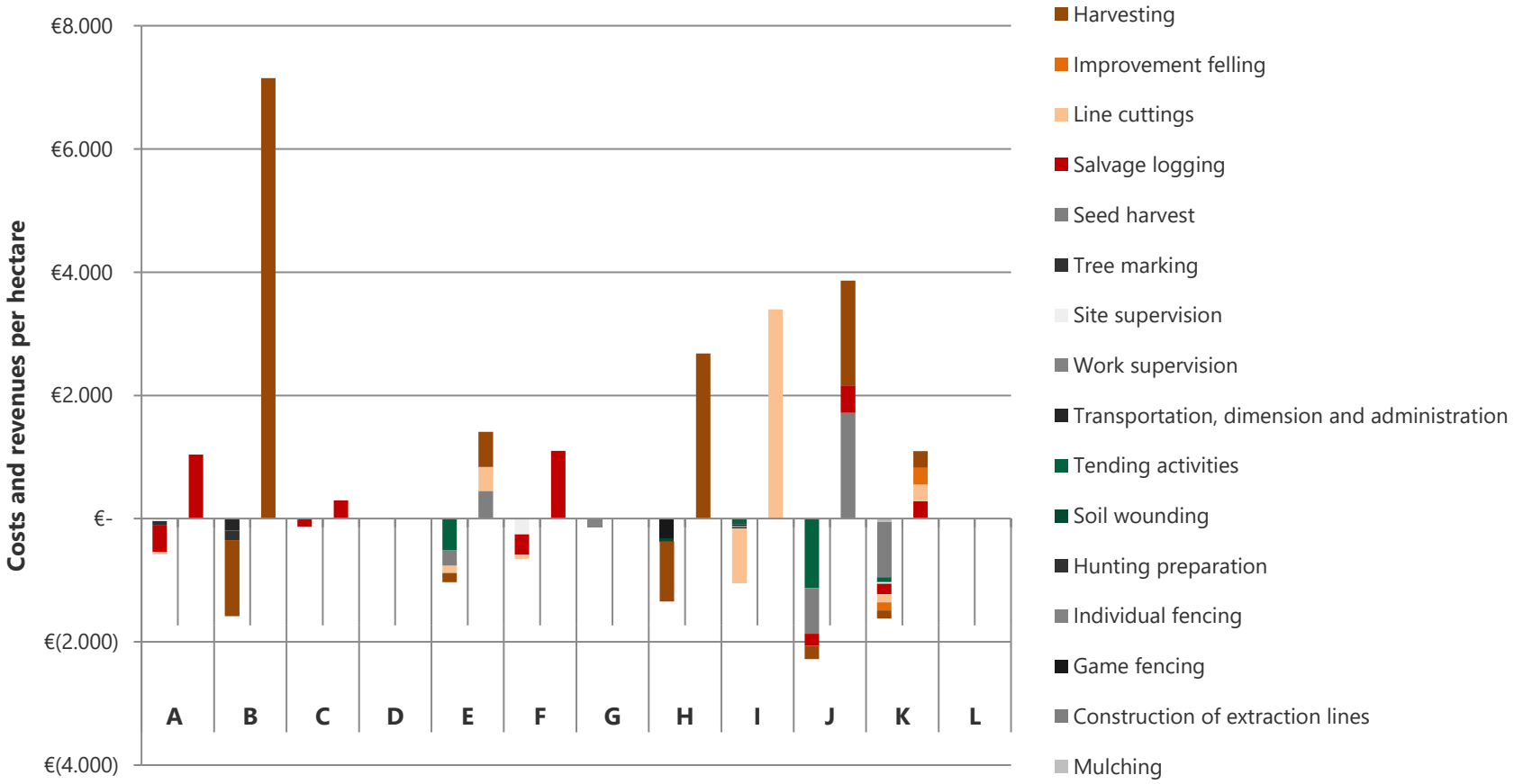
Costs and revenues per hectar from the first survey period



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Forest growth and structure analysis

- All reference areas are in transition phase
- Number of natural regeneration is decreasing during the transition phase
- Structural characteristics and tree composition is increasing

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Ecological monitoring

- Not all actual forest types fit to the potential vegetation
- Less deadwood than in regular age-class forest, most of the deadwood is in stumps, less in standing or laying stems
- Tree related microhabitats in a minimum stage

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Economic monitoring

- Allmost all reference areas show a positiv contribution margin
- High variability of input – output ratio
- Period of 5 years is too short for significant results
- Comparison with similar reference areas in the age class forest is difficult
- Overhead costs of the forest enterprise cannot be taken into account directly

Conclusions

- Definition of close-to-nature forestry must be extended
- Longer periods needed
- Methods including calculation of compensation

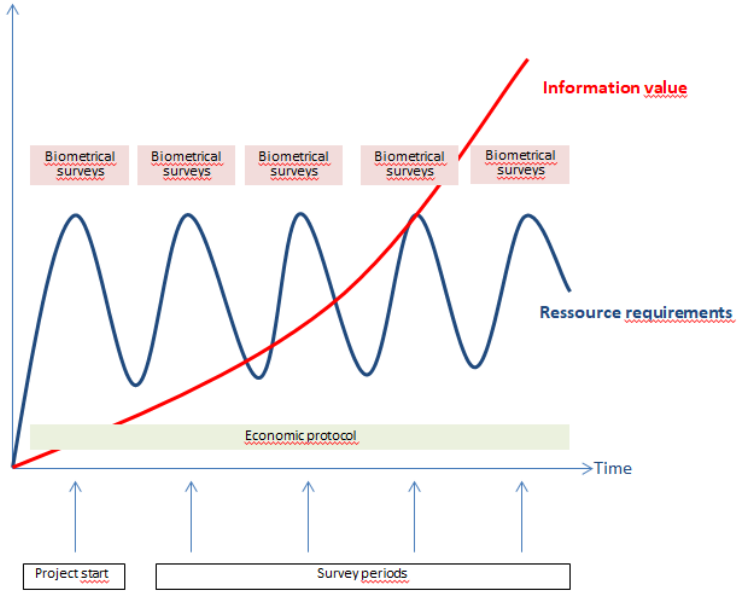

Foto | Filmstill aus „See Aural Woods" (Luma.Launisch & Takamovsky)

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