How to deal with tree-related microhabitats (TreMs) in daily forest management?

Different tools aimed at implementing conservation of TreMs into forestry

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INRA SCIENCE & IMPACT

DYNAFOR

CNPF

WSL

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TOOL 1

A hierarchized standard TreM typology (2018)

Ecological Indicators 84 (2018) 194–207

Contents lists available at ScienceDirect

Ecological Indicators

journal homepage: www.elsevier.com/locate/ecolind

Tree related microhabitats in temperate and Mediterranean European forests: A hierarchical typology for inventory standardization

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Table 5: Illustrations of the TreM types in European temperate and Mediterranean forest.

Form	Group	Types					
Cavities l.s.	Woodpecker-breeding-cavities	Small-woodpecker-breeding-cavity Entrance-ø<4cm	Medium-sized-woodpecker-breeding-cavity Entrance-ø=4-7cm	Large-woodpecker-breeding-cavity Entrance-ø->10cm	Woodpecker-flute Entrance-ø->3cm		
	Rot-holes	Trunk-base-rot-hole (closed-top,-ground-contact) Opening-ø->10cm	Trunk-rot-hole (closed-top,-no-ground-contact) Opening-ø->10cm	Semi-open-trunk-rot-hole Opening-ø->30cm	Chimney-trunk-base-rot-hole Opening-ø->30cm	Chimney-trunk-rot-hole Opening-ø->30cm	Hollow-branch Opening-ø->10cm
	Insect-galleries	Insect-galleries-and-bore-holes Hole-ø->2cm-or-area->300cm²					
	Concavities	Dendrotelm ø->15cm	Woodpecker-foraging-excavation Depth->10cm,-ø->10cm	Trunk-bark-lined-concavity Depth->10cm,-ø->10cm	Root-buttress-concavity Entrance-ø->10cm		

- 7 forms
- 15 groups
- 47 types

TOOL 2

A published overview of integrative forestry and biodiversity-friendly practices (2013)

In Focus – Managing Forest in Europe

2.1 Habitat trees:
key elements for forest biodiversity

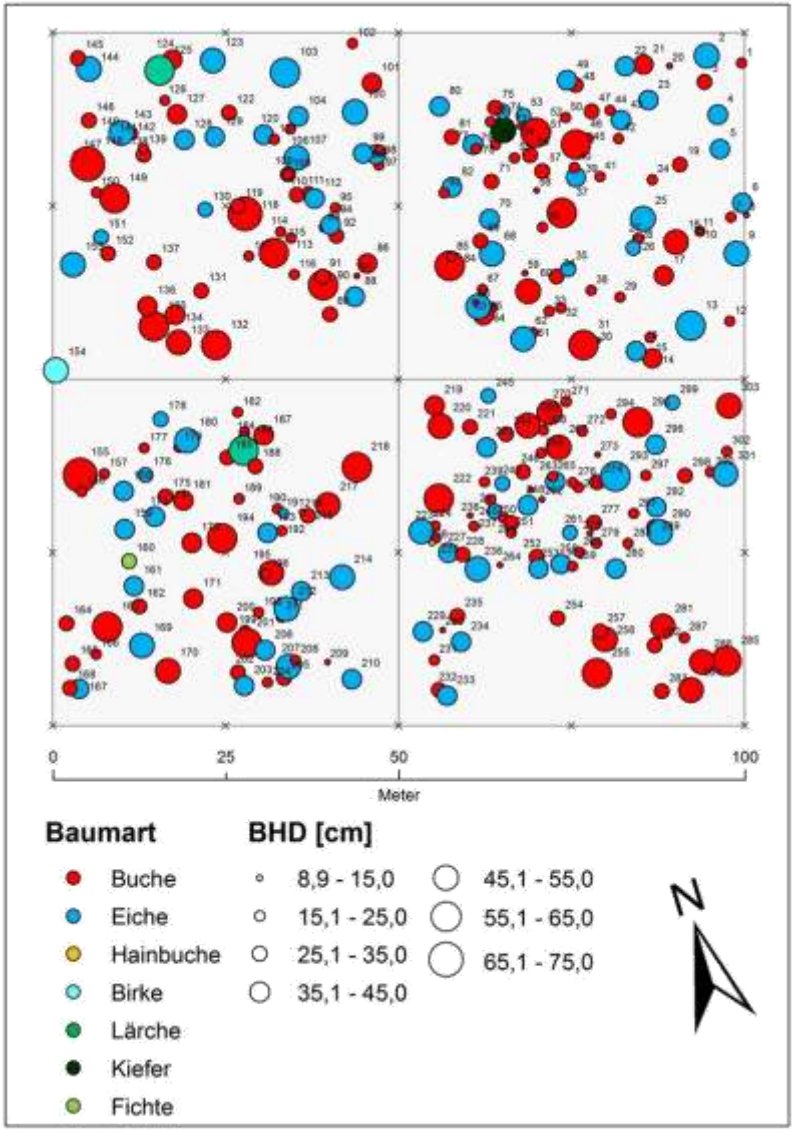
Rita Bütler, Thibault Lachat, Laurent Larrieu and Yoan Paillet

Habitat trees are very large, very old, and dead or living microhabitat-bearing trees. They are of prime importance for specialised forest flora and fauna

http://www.integrateplus.org
See also: www.informar.eu

TOOL 3

The biodiversity-friendly Marteloscope tool: to get into practice



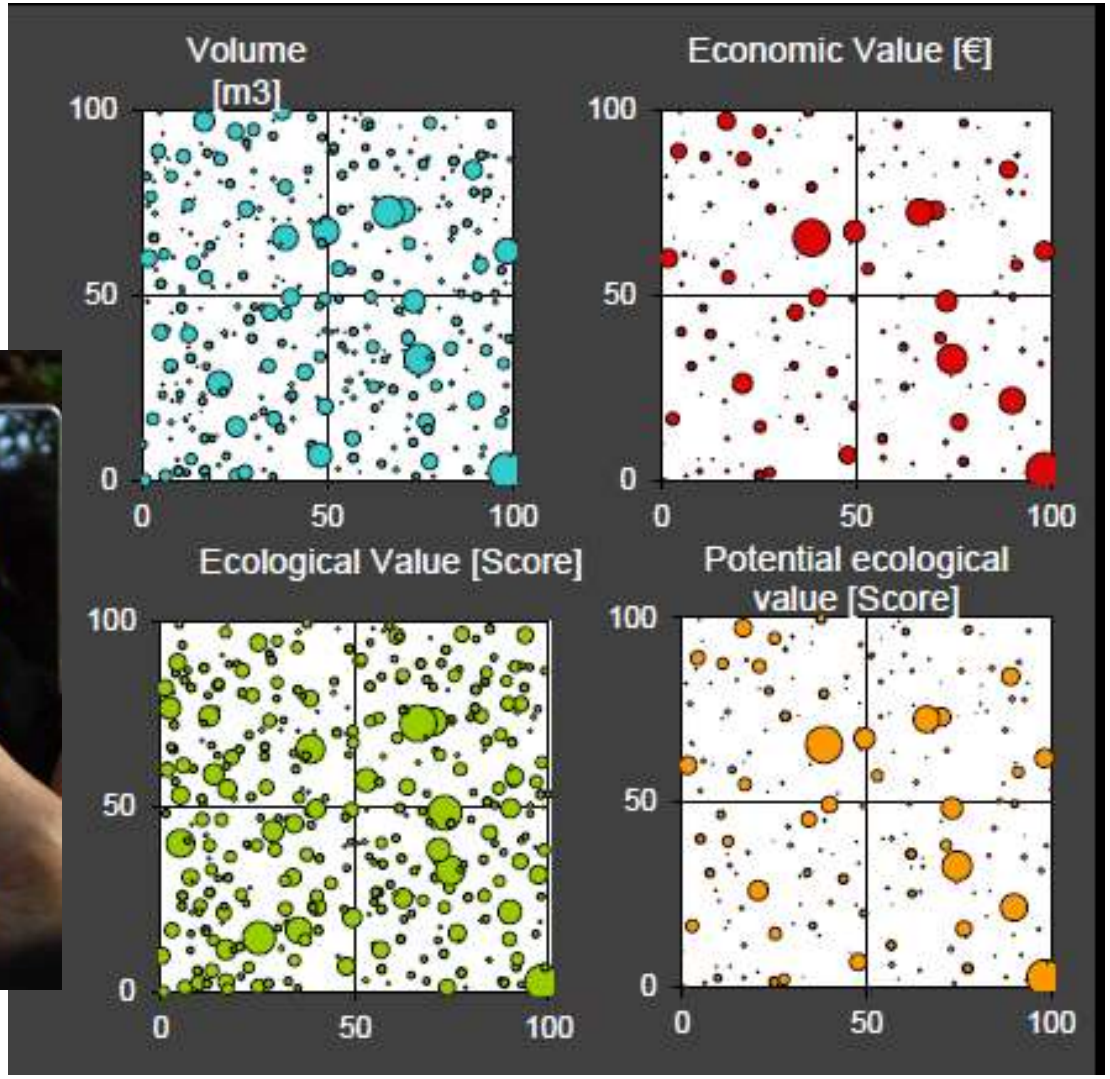
- 1 ha-square area
- all trees are **numbered, mapped & recorded**
- Each TreM gets an ecological score

each tree gets an ecological value

Both individual economic and ecological evaluation

TOOL 3

A dedicated software embedded in field tools allows practical training, forestry scenarii comparison and initiates debates



TOOL 3

A European network of >50 marteloscopes for sharing experiences of biodiversity-friendly practices

TOOL 4

HabiApp: a smartphone app to quickly and easily record TreMs by everyone at any time (Release: November 2019)

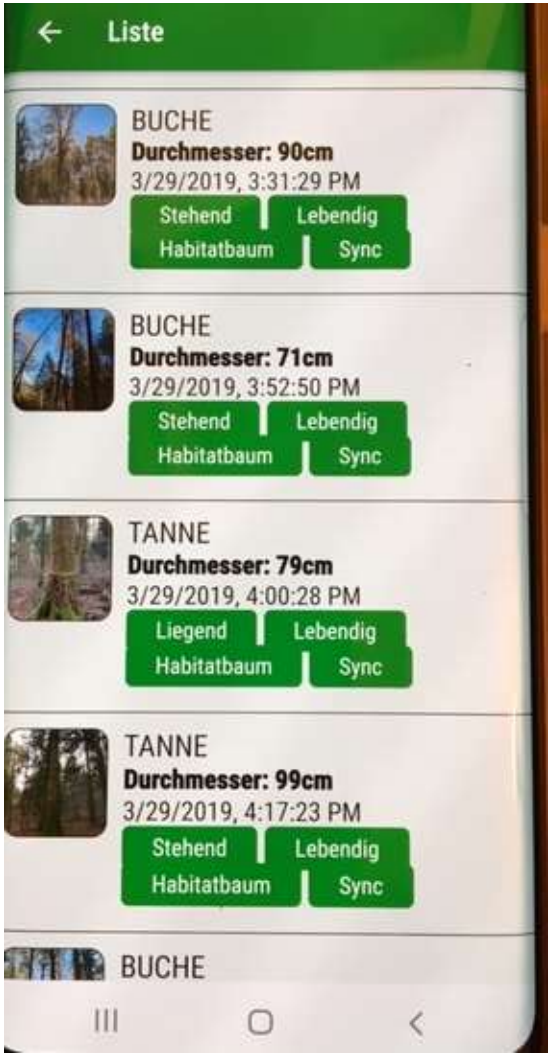
- Accessible offline
- Available in German and French
- Record submission by email (csv-file) or directly synchronized to a web server

TOOL 4

HabiApp

Map

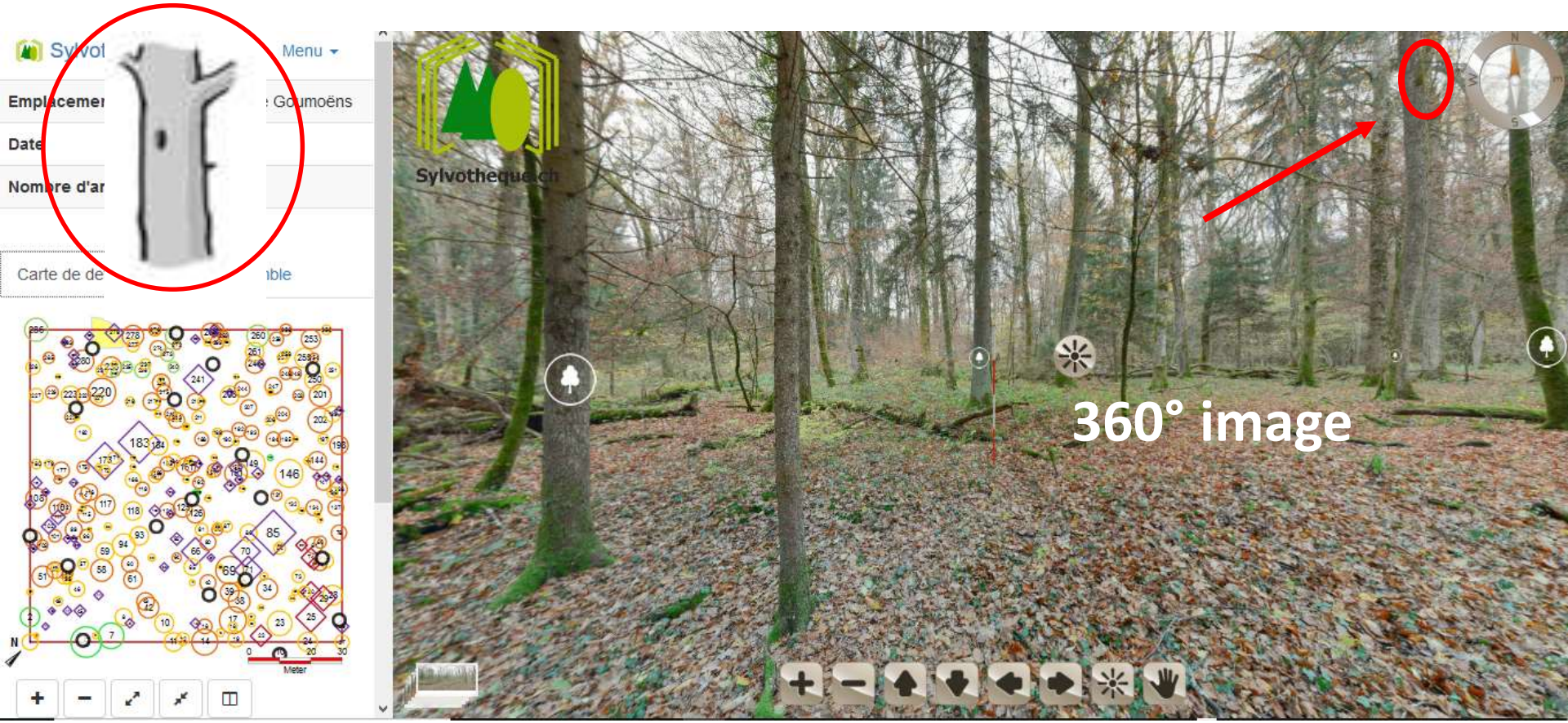
Record List (habitat-trees)



TreM typology

TOOL 5

An immersive virtual tour of a marteloscope to discover TreMs and their role for biodiversity (2020)



Training tool for forest managers and owners: 4 training levels, videos, pictures, drawings, etc.

TOOL 6

A booklet describing 47 TreM types (November 2019)

TreM type →

Definition →

Frequency in managed and old-growth forests →

Additional informations →

- **In French and German**
- 60 pages

Suggested minimum thresholded size to be recorded ←

Recovery time ←

Main associated taxa ←

TOOL 7

oFOREST book: an overview of good forestry practices across Europe (released July 2020)

How to implement biodiversity measures into daily forest management?

- 100 authors from science, policy and practice
- Available online
- Virtual tour of European forests
- **A tool box providing different silvicultural options**

To conclude…

Many tools are or will be available soon: let's implement TreM-friendly forestry practices!

In a nutshell	
TOOL 1	TreM Typology
TOOL 2	INTEGRATE book
TOOL3	Marteloscopes
TOOL 4	HabiApp
TOOL 5	Virtual tour app
TOOL 6	Booklet
TOOL 7	OFOREST book

Further research needed to:

- **Provide guidelines with quantitative benchmarks**
- **Quantify the ecological role of TreMs for biodiversity conservation at the stand level**


Be patient, kid, and come back in 2119…
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