

## MARTELOSCOPE MANAGER WORKSHOP

Sharing experiences on the use of demonstration sites  
for training, education and research

28-29/06/2022

# The use of marteloscopes within LIFE GoProFor Italy

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[www.lifegoprofor.eu](http://www.lifegoprofor.eu)

# A few words on the Italian context



**Total wooded area:** 11.054.458 ha (**36,7%** of the Country area)

*ITALIAN NATIONAL FOREST INVENTORY (INFC2015)*

**Annual increment:** 4.000 ha/year (from 2005 to 2015)

## Silviculture in Italy

Even aged structures: **about 75%**

High forests: 42%

Coppices: 43%

Not canonical silvicultural systems: 14%



**Forestry organizations:** The legislative power has been transferred from the State to the Regions → **very different situations** due to ecological conditions / administrative organization

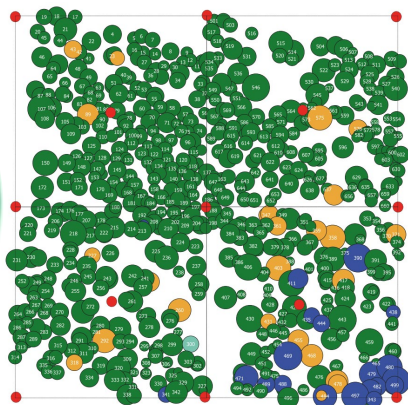
## Problematic aspects

- Open conflict between productive management and the conservation world
- Different methods of application of forest interventions and for the conservation of species
- Low incidence of investments of the Rural Development Program aimed at the Habitat Directive

# LIFE GoProFor (01/09/2018 – 31/03/2023)

## Objectives

- Define and disseminate **forest management tools** for conservation priorities within Natura 2000 Network
- **Exchange experiences and Good Practices** derived from 25 years of the LIFE Program
- **Increase awareness** on forest habitats and species conservation **in all the actors involved** in the management of forests within Natura 2000 Network



# The main pillars of LIFE GoProFor



## The European Database of forest-related Good Practices

LIFE projects analysis, and collection and description of Good Practices

[www.lifegoprofor-gp.eu](http://www.lifegoprofor-gp.eu)



## Training

Training packages on 12 forest-related topics based on Good Practices and other tools (Italian audience)



## Italian National Network

Improve cooperation between all actors in management of forests in N2000, providing indications and suggesting the best GOOD PRACTICES to apply



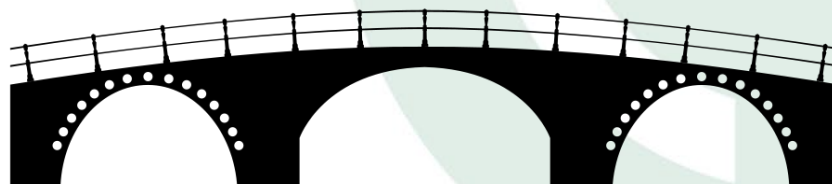
## European Network

Exchange of experiences and Good Practices and lay the foundations for a European training system for forest management within Natura 2000 Network

## Target of training

All the actors involved in the management of forests within Natura 2000 Network

- *Forest professionals*
- *Forest operators*
- *Forest enterprises*
- *Landowners*
- *Officials and technicians of public bodies*
- *N2000 site managers*
- *Naturalists / Biologists*
- *University students*





**BIODIVERSITY  
CONSERVATION**

**FOREST MANAGEMENT**



# Training activities – Contents and methodes

Level 1: mix mode		Level 2: e-learning
THEORY	HABITAT AND BIRDS DIRECTIVES AND N2000 NETWORK	FINANCIAL AND MANAGEMENT INSTRUMENTS FOR NATURA 2000 NETWORK
	THE IMPORTANCE OF DEADWOOD AND CONSERVATION OF SAPROXYLIC ORGANISMS	FOREST AMPHIBIANS AND TECHNIQUES FOR THEIR CONSERVATION
	TREE MICROHABITATS AND TREE ECOLOGICAL VALUE 	FOREST SPECIES AND TECHNIQUES FOR THEIR CONSERVATION
	THE POTENTIAL BIODIVERSITY INDEX (IBP)	FORESTS AND CLIMATE CHANGES
	SUSTAINABLE FOREST MANAGEMENT FOR BIODIVERSITY CONSERVATION	IAS AND TECHNIQUES FOR CONTROL AND ERADICATION
	EXAMPLES OF FOREST-RELATED GPs	ECOSYSTEM SERVICES
PRACTICE	TREE MICROHABITATS IDENTIFICATION 	WATER COURSES IN FORESTS AND TECHNIQUES FOR CONSERVATIVE INTERVENTIONS
	APPLICATION OF SILVICULTURAL MODELS WITHIN A MARTELOSCOPE	
	APPLICATION OF IBP	



# Training activities – Level 1

## Theoretical part - Online lessons

- 16 hours
- 2 tests

Saproxylic organisms

Good Practices

Tree microhabitats

Tree oriented-silviculture

Deadwood

Potential Biodiversity Index

Silvicultural model

Natura 2000

**Legno morto: importanza per la Biodiversità**

Il legno morto ospita approssimativamente 1/3 della biodiversità forestale.

Le specie che dipendono dal legno morto sono chiamate "saproxiliche"

**Es. specializzazione: Cavità del tronco con rosura (predatori e prede)**

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**CAVITÀ: Cavità formate da picidi**

Il diametro di ingresso e posizione variano a seconda delle specie

- CV11: 4 cm
- CV12: 5-6 cm
- CV13: 10 cm

CV14: Fori scavati di forma conica. L'apertura esterna è più grande dell'interno: fori di alimentazione.

CV15: "Riatur". Sequenza di più cavità di nidificazione.

**DETOURAGE o CROWN RELEASE**

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**I+ Trainer software**

"seeing is building better understanding"

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**IBP: indicatore indiretto & complesso**

7 fattori legati al popolamento e alla gestione forestale (punteggio tot: 35)

- A - specie autoctone
- B - struttura verticale della vegetazione
- C - grandi alberi morti in piedi
- D - grandi alberi morti al suolo
- E - Alberi viventi molto grandi
- F - alberi vivi dendronici
- G - alberi morti

**La rete europea dei martelloscopi**

Il progetto **Integrate+**

Progetto dimostrativo che ha come obiettivo principale quello di creare una rete europea di siti dimostrativi per l'integrazione della conservazione della biodiversità nella gestione forestale.

**Integrate+**

**Obiettivo:** creazione di una rete europea di siti dimostrativi per integrare la conservazione della biodiversità nella gestione delle foreste

**Il Catalogo dei microhabitat degli alberi:**

- Sviluppato dal Ministero Tedesco dell'Alimentazione e dell'Agricoltura (BMEL) per il progetto **INTEGRATE+** (<http://www.integrateplus.org/>)
- Compilato da un team europeo di esperti di microhabitat e organismi saproxilici
- Disponibile anche come App (in inglese)

Forest species





# Training activities – Level 1

## Practical part – 7 training «gyms»

➤ 16 hours (2 days)



➤ Path for the identification of TMH



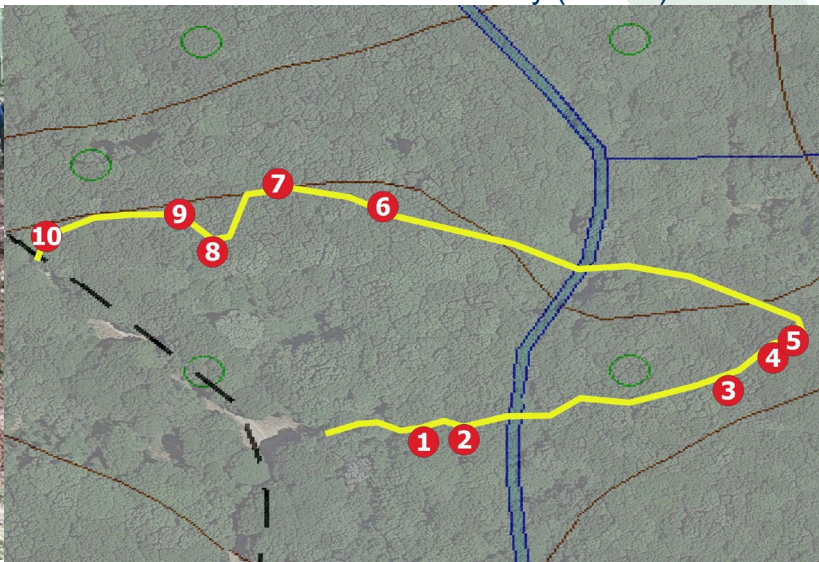
➤ Application of IBP



➤ Marteloscopes

In collaboration with:

- Forestas Agency (Sardinia)
- Palermo University (Sicily)
- Padua University (Veneto)
- Molise University (Molise)





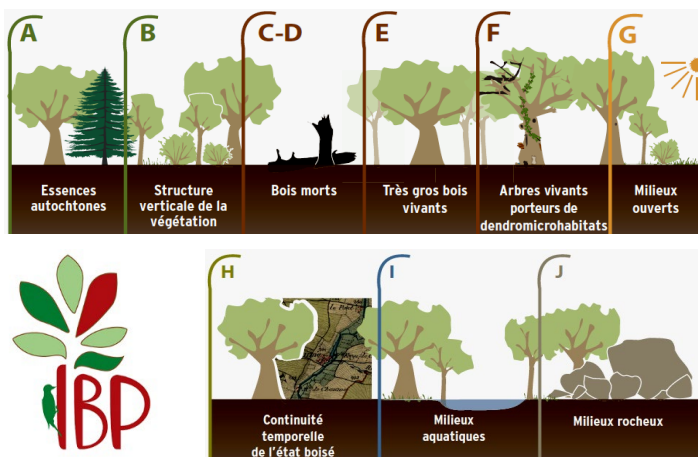
# Training activities – Level 1

## Practical part

- **TMH** → understand the **ecological value of a tree**
- **IBP** → understand the **importance of factors** to be taken into account when selecting trees
- **Marteloscope** → simulation of an intervention (4 teams, around 4 hours):
  - ✓ applying tree-oriented silviculture,
  - ✓ favouring the IBP factors,
  - ✓ achieving positive stumpage value while preserving trees with the highest ecological value

### The exercise

- Select 30-40 elite trees of economical value
- Help them by cutting competitors (selection from above), with an eye on TMHs
- Preserve habitat trees during selection
- Preserve sporadic trees species
- Try to achieve positive stumpage value, but with a low incidence on the overall ecological value
- Create an open area of ~400 m<sup>2</sup>
- If necessary, release laying/standing deadwood



### 10 key factors for potential biodiversity

- Tree composition
- Vertical structure
- Standing and laying dead wood
- Large trees
- Tree microhabitats
- Open areas
- Persistence of forest cover
- Aquatic habitats
- Rocky habitats



# Training activities

Return the results:  
in the field...



**GoProFor**

GOOD PRACTICES IMPLEMENTATION NETWORK  
FOR FOREST BIODIVERSITY CONSERVATION  
IMPLEMENTARE IL NETWORK DELLE BUONE PRATICHE PER LA  
CONSERVAZIONE DELLA BIODIVERSITÀ FORESTALE

Gruppo A	N/ha	Volume (m <sup>3</sup> )	Valore economico (€)	Valore ecologico (punti habitat)	Microhabitat (N)
Condizioni iniziali	389	406,59	31.140	10.570	578
Intervento					
%					
Indici sulla massa asportata	N alberi habitat asportati/N alberi habitat (69)	Volume asportato/N piante asportate	Valore massa asportata/N piante asportate	Valore ecologico asportato/N piante asportate	N microhabitat asportati/N piante asportate
Indici sulle candidate	N candidate	Volume candidate/N piante candidate	Valore massa candidate/N piante candidate	Valore ecologico candidate/N piante candidate	N microhabitat candidate/N piante candidate

Gruppo A	N/ha	Volume (m <sup>3</sup> )	Valore economico (€)	Valore ecologico (punti habitat)	Microhabitat (N)
Condizioni iniziali	389	406,59	31.140	10.570	578
Intervento					
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Indici sulle candidate	N candidate	Volume candidate/N piante candidate	Valore massa candidate/N piante candidate	Valore ecologico candidate/N piante candidate	N microhabitat candidate/N piante candidate
Gruppo B	N/ha	Volume (m <sup>3</sup> )	Valore economico (€)	Valore ecologico (punti habitat)	Microhabitat (N)
Condizioni iniziali	389	406,59	31.140	10.570	578
Intervento					
%					
Indici sulla massa asportata	N alberi habitat asportati/N alberi habitat (69)	Volume asportato/N piante asportate	Valore massa asportata/N piante asportate	Valore ecologico asportato/N piante asportate	N microhabitat asportati/N piante asportate
Indici sulle candidate	N candidate	Volume candidate/N piante candidate	Valore massa candidate/N piante candidate	Valore ecologico candidate/N piante candidate	N microhabitat candidate/N piante candidate
Gruppo C	N/ha	Volume (m <sup>3</sup> )	Valore economico (€)	Valore ecologico (punti habitat)	Microhabitat (N)
Condizioni iniziali	389	406,59	31.140	10.570	578
Intervento					
%					
Indici sulla massa asportata	N alberi habitat asportati/N alberi habitat (69)	Volume asportato/N piante asportate	Valore massa asportata/N piante asportate	Valore ecologico asportato/N piante asportate	N microhabitat asportati/N piante asportate
Indici sulle candidate	N candidate	Volume candidate/N piante candidate	Valore massa candidate/N piante candidate	Valore ecologico candidate/N piante candidate	N microhabitat candidate/N piante candidate
Gruppo D	N/ha	Volume (m <sup>3</sup> )	Valore economico (€)	Valore ecologico (punti habitat)	Microhabitat (N)
Condizioni iniziali	389	406,59	31.140	10.570	578
Intervento					
%					
Indice medio massa asportata	N alberi habitat asportati/N alberi habitat (69)	Volume asportato/N piante asportate	Valore massa asportata/N piante asportate	Valore ecologico asportato/N piante asportate	N microhabitat asportati/N piante asportate
Indice medio candidate	N candidate	Volume candidate/N piante candidate	Valore massa candidate/N piante candidate	Valore ecologico candidate/N piante candidate	N microhabitat candidate/N piante candidate

Initial stand  
Removed trees  
%  
Indexes on the removed trees  
Indexes on elite trees





# Training activities

## Return the results: later on....

# Practical training sessions

Toscana 7-8 Aprile 2022

Lazio 14-15 Dicembre 2021

Stand data (before intervention): Camaldoli-Toscana



22/04/2021 Camaldoli\_bio\_gruppo c

### Site conditions

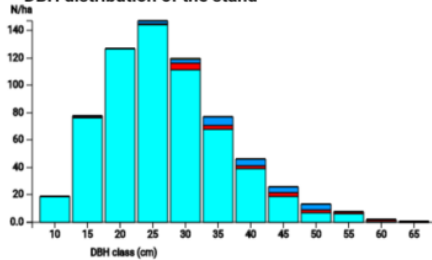
Altitude: 1270 m.a.s.l.  
Forest ecological region: Tuscany  
Geology / Bedrock: Sandstone  
Soil type: Brown podzolic soil  
Natural forest community:  
Asperulo-Fagetum  
Mean annual temperature: 8.7 C;  
Mean annual precipitation: 1642 mm;  
Ownership: State;  
Establishment: 2020

### Tree species distribution by volume (in %)



■ common beech: 86.8 %  
■ silver fir: 7.7 %  
■ sycamore maple: 5.4 %  
■ goat willow: 0.1 %

### DBH distribution of the stand



### Initial stand (details by tree species)

Tree species	N/ha	Basal area (m²)	Volume (m³)	Economic value (€)	Habitat value (pts.)	Microhabitats (N)
common beech	617	44.3	484	41247	19808	1283
goat willow	1	0.1	0.8	70	24	3
silver fir	21	3.3	43.1	3060	245	25
sycamore maple	25	3.2	29.9	2409	1664	99
Total	664	50.8	557.9	46786	21741	1410



## Number of participants

22

## Fotogallery

Fotogallery Corso Lazio 14-15 Dicembre 2021 >>>

## Instruction of the exercise

21P - Consegne esercizio martelloscopio

## Results of exercises

21P - Risultati Gruppo A 14 Dic 21

21P - Risultati Gruppo B 14 Dic 21

21P - Risultati Gruppo C 14 Dic 21

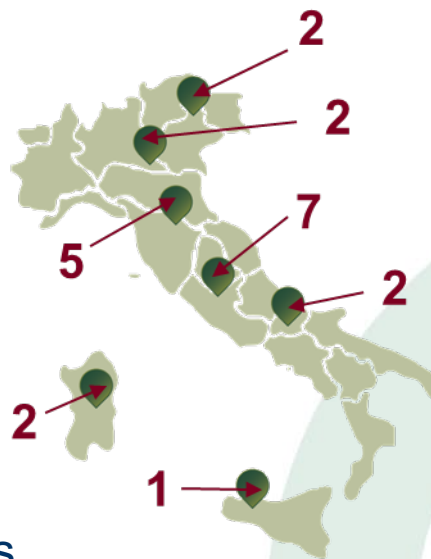
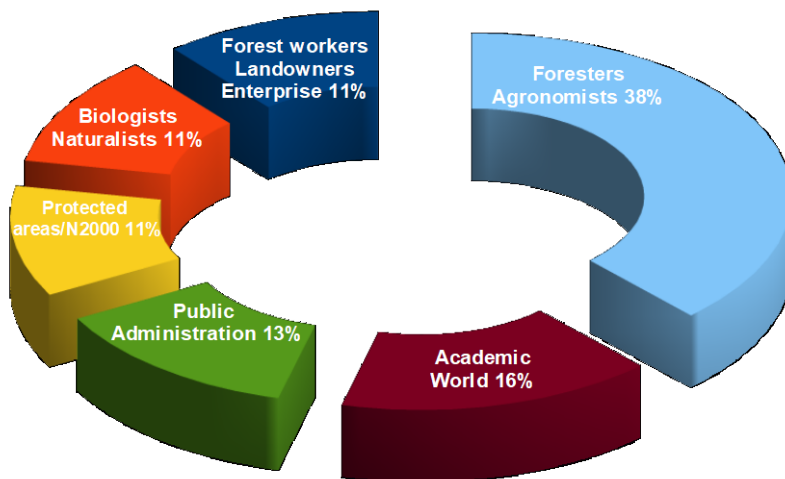
21P - Risultati Gruppo D 14 Dic 21



## Some results (2021)

### Level 1

- ✓ 629 participated online
  - 507 concluded LEV 1
- ✓ 5 online editions
- ✓ 21 practical training sessions



### Parte teorica

- Corso on line 23-24 e 27-28 Set 2021
- Corso on line 13 e 16 Lug 2021
- Corso on line 13 e 16 Apr 2021
- Corso on line 29-30 Mar e 01-02 Apr 2021
- Corso on line 18-19 e 25-26 Gen 2021

### Esercitazioni pratiche

- Lazio 14-15 Dicembre 2021
- Lombardia 2-3 Dicembre 2021
- Veneto 27-28 Ottobre 2021
- Molise 27-28 Ottobre 2021
- Molise 11-12 Ottobre 2021
- Veneto 04-05 Agosto 2021
- Toscana 26-27 Luglio 2021
- Lombardia 22-23 Luglio 2021
- Sardegna 10-11 Giugno 2021
- Sardegna 8-9 Giugno 2021
- Lazio 27-28 Maggio 2021
- Lazio 25-26 Maggio 2021
- Sicilia 20-21 Maggio 2021
- Lazio 11-12 Maggio 2021
- Lazio 6-7 Maggio 2021
- Toscana 21-22 Aprile 2021
- Lazio 08-09 Apr 2021
- Lazio 06-07 Apr 2021
- Toscana 03-04 Mar 2021
- Toscana 01-02 Mar 2021
- Toscana 25-26 Feb 2021

Ongoing activity

### Level 2

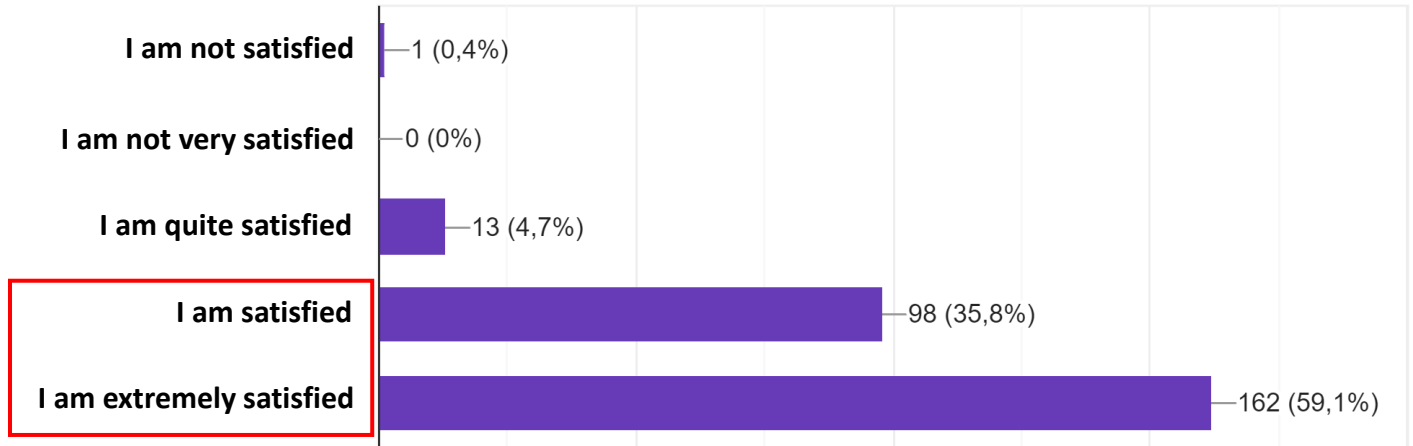
- ✓ 979 registered to the training platform
- ✓ 212 courses completely attended
- ✓ 174 courses passed through the final positive test.



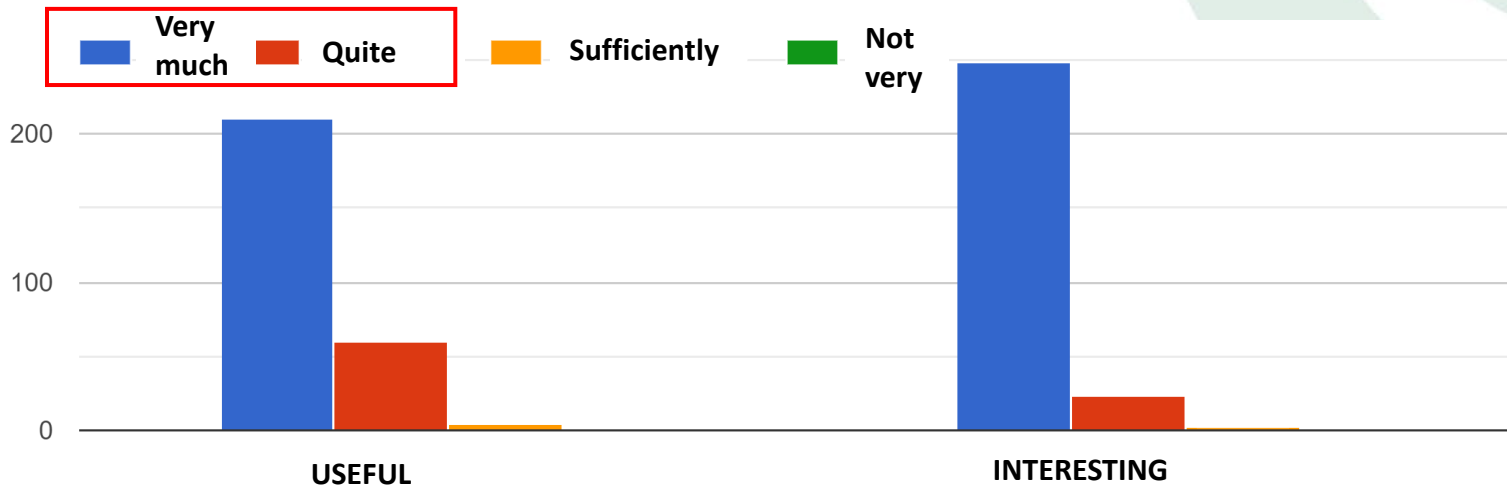


# Feedback from participants – about the training activity

*Give an overall assessment of the course*



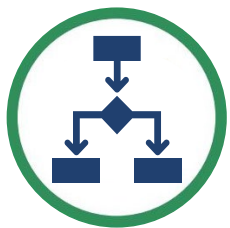
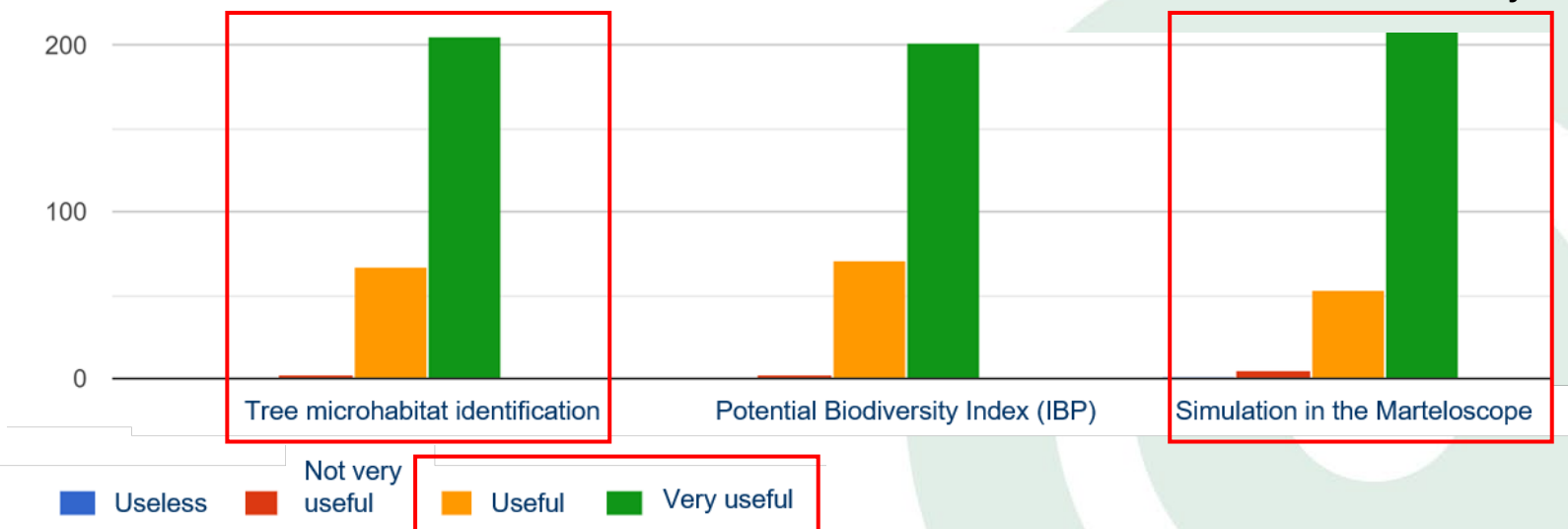
*The course as a whole seemed to you:*



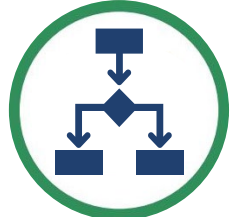


# Feedback from participants - about Integrate related aspects

How would you rate the practical part related to:



- **MORE PRACTICE IN THE FORESTS!** - Really useful and appreciated
- **MANY REQUESTS** for the replication of training formats and **related tools**



## **FUTURE (and present) PERSPECTIVES**

### **Replication of training formats and related tools – in Italy**

#### **Forestry Consortium «Alta Val di Susa» + Turin University**

- ✓ **2 new martelloscopes** (30/06-01/07 - First inauguration)
- ✓ Training of university students and technicians/staff of the Consortium

#### **Forest Service of Trento**

- ✓ **3 new training areas (with 3 new martelloscopes)** (Summer 2022)
- ✓ **Training of trainers** (Autumn 2022) for innovative forestry training, targeting technicians of the Province, local foresters and professionals

#### **Regional Natural Reserve «Selva del Lamone»**

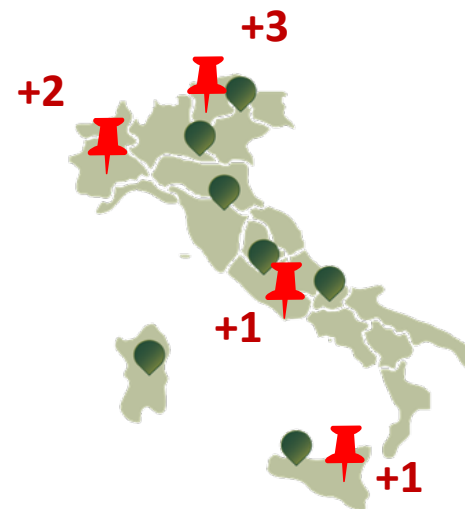
- ✓ **1 new martelloscope**
- ✓ Training activities for internal staff and forest operators/enterprises

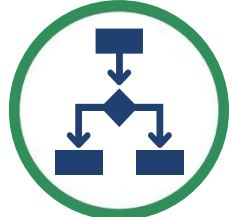
#### **Palermo University**

- ✓ **1 new martelloscope** for training of university students

#### **Regional Forest Agency FO.RE.S.T.A.S. (Sardinia)**

- ✓ **Management of the existing martelloscope** and use for the training of internal staff, forest operators/enterprises





## FUTURE PERSPECTIVES

### LIFE GoProFor – AFTERLIFE Plan



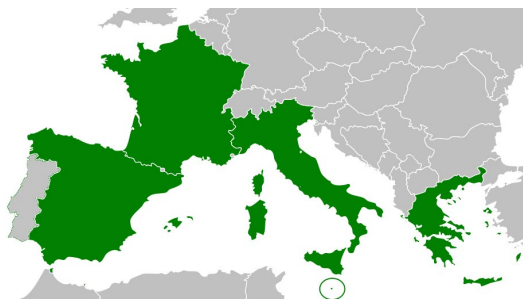
#### Establishment of a training school in Tuscany Region

- ✓ **Demonstrative forest - located in the State property**
- ✓ **Aim:** spreading the principles of irregular silviculture, to combine biodiversity conservation and productive purposes
  - **Training/demonstration activities** → including new marteloscopes

### LIFE GoProForMED (01/10/2022 – 30/09/2028)

#### Newly financed LIFE project, for the conservation of target forest habitats in the Mediterranean region

- ✓ **Aim:** provide flexible models of CNF management for the conservation of target habitats, through their application in demonstrative forest areas in 4 Mediterranean countries
  - **Training/demonstration activities** → including new marteloscopes (approximately 40-50)






# SOME REMARKS/SUGGESTION

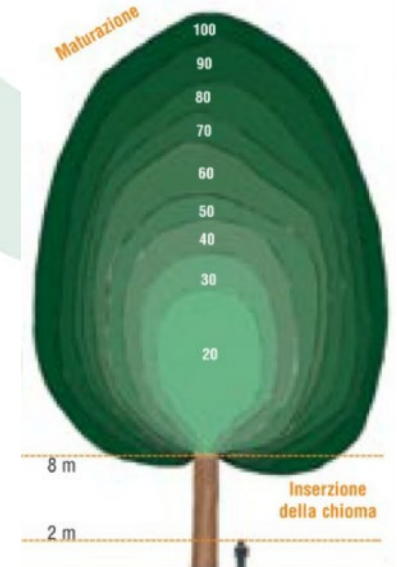
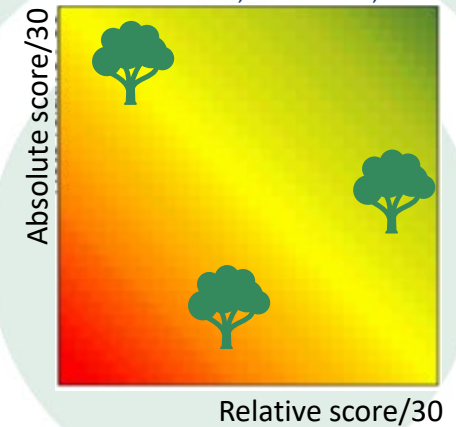
It could be interesting to integrate additional information/indicators

✓ **Tree ecological value: not only based on TMHs score**

- TMHs, Tree dimension, Tree species (absolute and relative value, linked to the area)

Facteur	Note absolue (total / 30)	Note relative (total / 30)
<b>A : Native species</b> 	Native species? Non native species → 0 <b>Native species → 5</b>	<i>Abondance de l'essence<sup>2</sup> ?</i> Si non autochtone → 0 Si autochtone et . ≥ 20 % → 2 . < 20 % et ≥ 3 tiges → 5 <b>. rare (1 ou 2 tiges) → 10</b>
<b>E Large trees</b> 	Native species? < Large trees → 0 Large trees → 2 Very large trees < 100 cm → 5 <b>Very very large trees ≥ 100 cm → 15</b>	<i>Score facteur E ?</i> < TGB → 0 TGB et . score E = 5 → 2 . score E = 2 → 5 <b>. score E = 0 ou 1 → 10</b>
<b>F : Dendromicrohabitats</b> 	<i>Nombre de groupe de dmh sur l'arbre ?</i> 0 group → 0 1 group → 2 2 groups → 5 <b>3/+ groups → 10</b>	<i>Score facteur F ?</i> absence de dmh sur l'arbre → 0 présence de dmh sur l'arbre et . score F = 5 → 2 . score F = 2 → 5 <b>. score F = 0 ou 1 → 10</b>

Gonin P., Drénou Ch., 2021



✓ **Tree potential economical value**

- If I help a tree, how much will it grow in the future?
- Is it possible to estimate its future economical value?



THANK  
YOU ALL