LIFE GoProForMED

WP3

Tools for Close to Nature forest management

Protocol for the characterization of demonstrative intervention areas

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Purpose of the document

The document consists of a standard protocol for the pre-intervention characterisation of demonstration areas, i.e. areas of 1 ha, located in the project's target forest habitats, where the project plans to apply irregular, continuous-cover forest management models according to *Closer to Nature* Forestry principles. Demonstration interventions are defined within the second planning level (T3.1), and are the subject of a specific document.

The areas of demonstration interventions are selected in the "Edge area" of the application sites, i.e. the forest matrix outside and contiguous to the ecological network made up of Core areas, Biodiversity Islands and Habitat Trees (first planning level - T3.1).

The project envisages that the entire Edge area can be managed by replicating the interventions tested in the demonstration areas.

This document intends to provide guidelines aimed at characterising the demonstrative areas from a structural and potential biodiversity point of view, together with the quality of the timber.

Characterization of the demonstrative areas.

The characterization of the demonstrative areas consists in the implementation of

- dendrometric surveys,
- timber quality assessment,
- IBP surveys (with a special focus on tree-related microhabitats - TreMs)

aimed at collecting the information necessary for the planning of the demonstrative interventions envisaged by the project.

The characterisation of timber quality is inspired by the document "Protocol for standing timber quality assessment of valuable broadleaves", carried out within the framework of the LIFE MixForChange project - LIFE15 CCA/ES/000060. Here the assessment is made on all tree species without distinction. The wood quality assessment should help to design silvicultural interventions and to integrate silvicultural criteria in order to generate value-added wood products.

Plot design

Dendrometric surveys and the timber quality assessment will be performed inside circular projected areas of 1256 m^2 (20 m radius) (Figure 1).

For each demonstration area of one hectare, it will be sufficient to characterise a single sampling plot. Plots are positioned making sure to choose sites deemed representative of the average or prevailing situation of the demonstrative area, and materialized on the ground by marking the boundaries and the centre.

The centers of the sampling plot are identified in the field by a coloured double ring of paint on the central tree. The IBP survey (1 ha) will be carried out over the entire surface of the demonstration area (Figure 1).
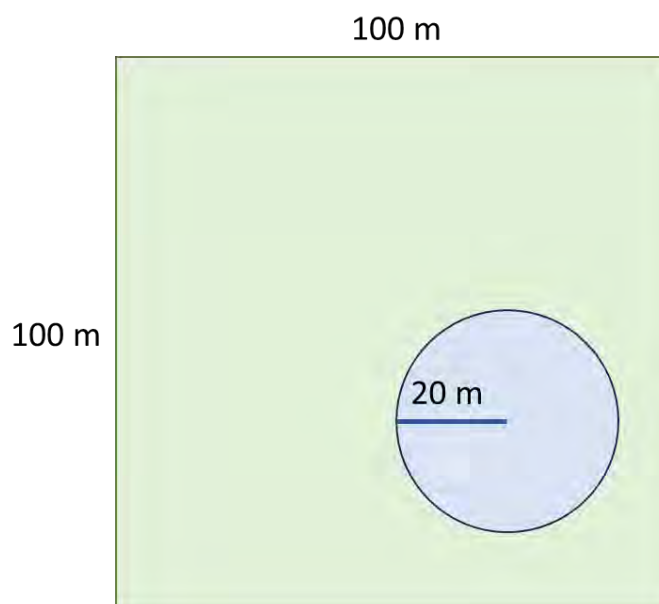

Figure 1. Demonstration area (1 ha) and sampling plot (20 m radius). The IBP survey (1 ha) will be carried out over the entire surface of the demonstration area

Dendrometric survey

Inside each sampling plots, the diameter at breast height, defined as 1.35 m up from the highest point of ground at the tree's base, will be measured on living standing trees with a diameter > 7.5 cm. For a subsample of 20% (representative of the DBH distribution of the plot), tree height will be measured.

For each standing tree, the surveyors will report the species, the tree type (high tree, coppice shoot, standard), and the social position (dominant, co-dominant, intermediate, suppressed; Figure 2).

Figure 2. Tree social position: D= dominant, C= Co-dominant, I= intermediate, S=suppressed.

What to include	Living trees (diameter > 10 cm)
What to record/ measure	Species
	DBH, at 1.35 m from the highest point of the ground at the tree base
	Height: for 20% of living standing trees, covering the whole diametric range.
	Tree type (high tree, coppice shoot, standard)
	Social position (dominant, co-dominant, intermediate, suppressed

Timber quality assessment
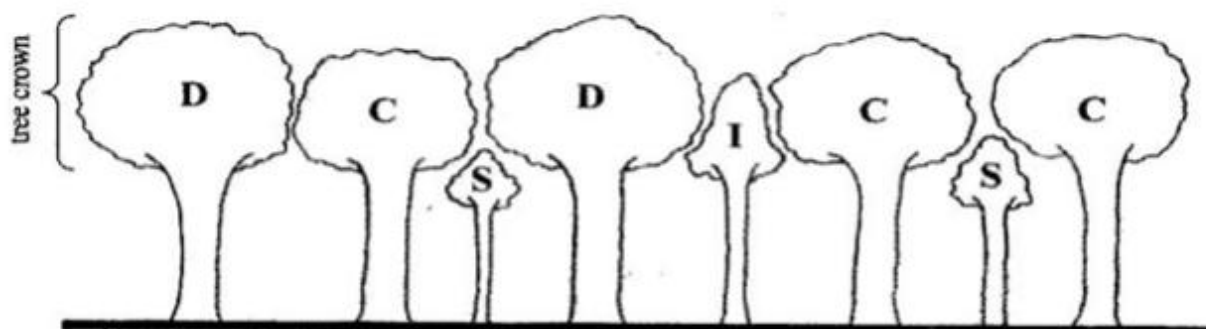
The evaluation, borrowed from the methodology proposed in LIFE LIFE MixForChange - LIFE15 CCA/ES/000060, is carried out on all tree species.

The assessment is carried out following 2 different modules, depending on the diametric classes:

Module 1: assessment of the **potential for timber quality production** of standing small and intermediate trees **(DC10-25/30)**: this allows us to identify trees that are likely to generate added value timber products in the future, so that they can be promoted through pruning and/or selective thinning depending on their development status.

Module 2: assessment of **standing timber quality in intermediate and large trees (DC25+)**: this allows us to assess the timber quality of standing trees and helps decide whether to apply silvicultural intervention, e.g. selective thinning or felling.

Module 1 – small and intermediate trees (DC10-25/30)

The aim is to facilitate detection of trees likely to generate added value timber products in the future.

MODULE 1	
What to include	Living standing trees (DC10-25/30) • Oak (diameter = 7.5-32.5 cm) • Other broadleaves (diameter =7.5 - 27.5 cm)
Elements to consider for the assessment	High vitality, dense crown not compressed vertically
	Absence of relevant wounds or rot
	At least one log (>250 cm long) without live branches • Oak: without live branches > 6 cm; • Other species: without live branches > 4 cm
	All the visible knots and branches appear on parts of the stem with diameter < 20 cm
	Log with inclination <10º and curvature < 3 cm/m
	Cherry: without dead branches with Ø>3 cm
	In Mediterranean areas: ash, maple and cherry NOT located in crests or SW aspect
What to record/ measure	Potential for timber quality production (Y/N)

Figure 3. left (foreground): tree with an inclination of 10°; right: tree with curvature of 3 cm/m (From LIFE Mixforchanges)

Module 2 – intermediate and large trees (DC>25)
The aim is to assess the timber quality of standing trees based on their morphological features.

The timber quality categories for a log correspond to those defined in the official ISO rules:

> **A: exceptional quality**: log suitable for use in veneer, fine furniture and high quality cooperage
>
> **B: special and top quality sawnwood**: furniture, cooperage, beams, turnery
>
> **C: second and intermediate quality sawnwood**: small furniture, carpentry, flooring, beams
>
> **D: oak sleepers, pallets**
>
> **E: pulp, fuelwood**

For each of these categories Table 1 shows the values to be taken into account for various assessment variables. The presence of rot, cracks or insect holes in the log are incompatible with any of the categories

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Improvement of the conservation status of forest habitats in the
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shown. The categories with lower qualities (**D: oak sleepers, pallets; E: pulp, fuelwood**) have not been considered.

QUALITY CLASS	FEATURES
A	LOG LENGTH > 250 cm CURVATURE < 2 cm/m OVALITY < 1.15 (D/d) DIAMETER > 45 cm WITHOUT ROT, CRACKS, INSECT HOLES
B	LOG LENGTH > 250 cm CURVATURE < 2 cm/m OVALITY = no limit DIAMETER > 40 cm WITHOUT ROT, CRACKS, INSECT HOLES
	LOG LENGTH > 300 cm CURVATURE < 4 cm/m OVALITY = no limit DIAMETER > 40 cm WITHOUT ROT, CRACKS, INSECT HOLES
C	LOG LENGTH > 200 cm CURVATURE < 10 cm/m OVALITY = no limit DIAMETER > 22,5 cm WITHOUT ROT, CRACKS, INSECT HOLES
	LOG LENGTH > 250 cm CURVATURE < 10 cm/m OVALITY = no limit DIAMETER > 22,5 cm WITHOUT ROT, CRACKS, INSECT HOLES
	LOG LENGTH > 250 cm CURVATURE < 2 cm/m OVALITY = no limit DIAMETER > 22,5 cm WITHOUT ROT, CRACKS, INSECT HOLES
D / E	DIAMETER < 22.5 cm CLEAN BOLE < 200 cm CURVATURE > 10 cm/m PRESENCE OF ROT, CRACKS, INSECT HOLES

Table 1: Dimensional and morphological requirements of the three timber quality categories considered

The quality category of a tree can be expressed as the length of logs (rounded to 0.5 m) th can be assigned to the highest quality category possible.

For instance, a tree with a 3 m long log grade A and another 2 m long log grade C could be expressed as: 3A+2C.

In the case of a potential use for cooperage, it could be expressed with "b" subscript: $1{,}5A_b+3B$.

Annex 2 shows a diagram to facilitate use of this module in the field.

MODULE 2	
What to include	Living trees (diameter > 22,5 cm)
Elements to consider for the assessment	Species
	DBH (cm)
	Log lenght (cm)
	Bole height (m)
	Curvature (cm/m)
	Ovality (D/d)
	Rot, cracks, insect holes
What to record/ measure	Optimal quality category

IBP survey

The IBP survey of 1 ha will be carried out over the entire surface of the demonstration area.

As regards the survey of the **F factor – Tree microhabitats**, the kind of survey is unlimited, i.e. all the elements observed within the survey plot are noted on the fieldsheet.

Precisely, all the types of TreMs encountered must be underlined on the survey form, without necessarily reporting their number (as in the picture below).

Other suggestions for the surveys

The survey requires at least 2 surveyors.

List of required instruments:

- Vertex / telemeter for plot delimitation using horizontal distances and height measurements
- Calliper / tree diameter tape
- Spray paint
- GPS device
- Binoculars for to assess tree microhabitats in the upper part of the crown
- Printed version of the fieldsheets (structure, timber quality) – Annex 1
- Printed version of the diagram of timber quality assessment criteria – Annex 2
- Printed version of the IBP field sheets and IBP auxiliary material (sheet to support the survey, aquatic and rocky habitats sheets, sheet for the recognition of tree microhabitats)

ANNEX 1 – fieldsheet for dendrometric and timber quality survey

ID	Species	Tree type	Social Pos.	DBH (cm)	Living crown height	Timber quality Potential	Timber quality Quality Class	ID	Species	Tree type	Social Pos.	DBH (cm)	Living crown height	Timber quality Potential	Timber quality Quality Class	RECAP

LIFE21-NAT-IT-LIFE GOPROFOR MED 10107 | Date | Surveyors | Plot ID
LIFE21-NAT-IT-LIFE GOPROFOR MED 10107 | Date | Surveyors | Plot ID

RECAP

Social Position
dominant =1
co-dom. =2
intermed. =3
suppressed =4

Tree type
high trees =1
cop. shoots =2
standards =3

Timber quality
Potential = (DC10-25/30)
Quality class = (DC>25)

ANNEX 2. Diagram of timber quality assessment criteria for standing logs of intermediate or large trees

INTERMEDIATE OR LARGE TREE (DC ≥ 25)

DIAMETER > 22.5 cm
CLEAN BOLE > 200 cm
(or > 120 cm if oak, chestnut, cherry for cooperage)
CURVATURE < 10 cm/m
WITHOUT ROT, CRACKS, INSECT HOLES

NO → QUALLITIES D or E

QUALITY A: Exceptional quality: log suitable for veneer, fine furniture and high quality cooperage
QUALITY B: special and top quality sawnwood: furniture, cooperage, beams, turnery
QUALITY C: Second and intermediate quality sawnwood: small furniture, carpentry, floors, beams
QUALITY D: Oak sleepers, pallets
QUALITY E: Pulp, fuelwood

YES

LOG LENGTH > 250 cm
(or > 120 cm if oak, chestnut, cherry for cooperage)

NO

There are additional requirements for each species and industrial use (Annex 2). The most relevant visual aspects are:

Oak: epicormic shoots and rotten knots
Ash: spiral grain and knots
Maple: knots
Cherry: dead branches and knots

Veneer: homogeneous bark and colour
Cooperage: without knots

YES

CURVATURE < 2 cm/m — NO → CURVATURE < 4 cm/m — NO → QUALITY C

YES   YES

OVALITY < 1.15 (D/d) — NO → LOG LENGTH > 300 cm (or > 120 cm if oak, chestnut, cherry for cooperage) — NO

YES   YES

DIAMETER > 45 cm (maple > 40 cm) Imperceptible knots — NO → DIAMETER > 40 cm (maple, cherry > 35 cm) — NO → LENGTH > 450 cm CURVATURE < 2 cm/m — YES → QUALITY C - BEAMS

NO

YES   YES

QUALITY A   QUALITY B → LENGTH > 450 cm CURVATURE < 2 cm/m → QUALITY B - BEAMS