

LIFE MixForChange: innovative management strategies for climate change adaptation of mixed sub-humid Mediterranean forests



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Multifunctional Forest Management Programme
Forest Science and Technology Center of
Catalonia (CTFC)

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1. Project context



Main challenges of Mediterranean forests

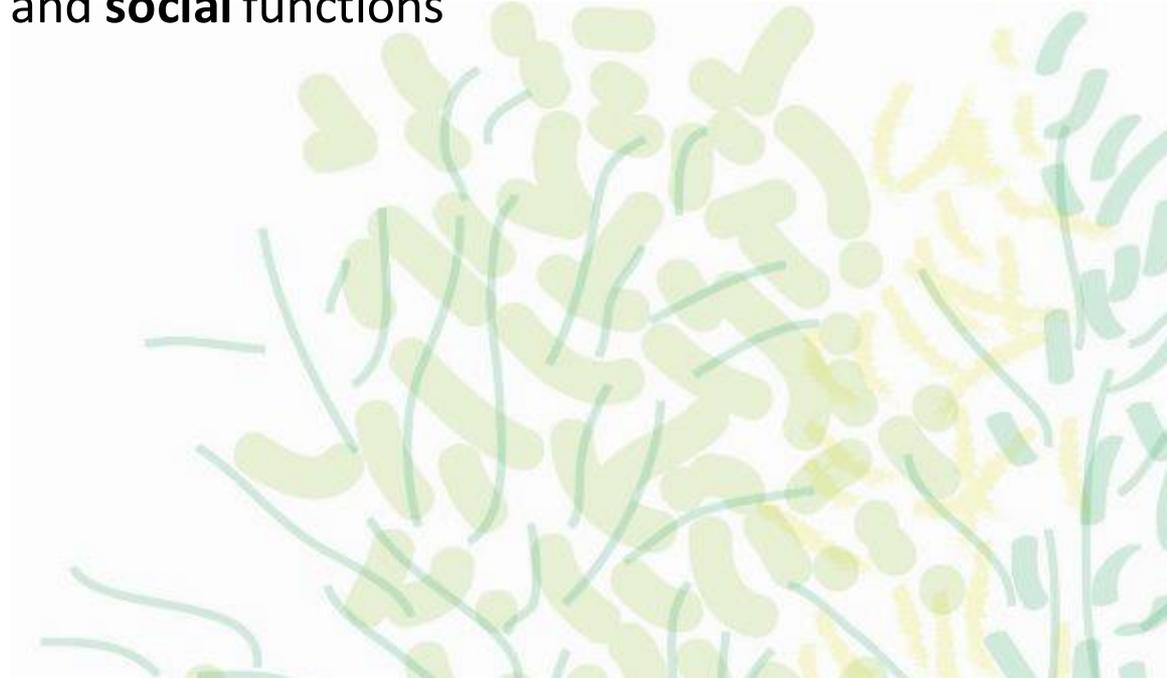
- Fire risk
 - Drought, pests, low vitality
 - Low profitability → abandonment → higher vulnerability
 - Multiple demands (periurban forests, Natura2000...)
 - Complexity: species, altitudinal range, aspect...
- + Climate change!**

→ Sustainable & Multifunctional & Adaptive forest management
Sustainable = social + economic + environmental

2. LIFE MixForChange overview



Main aim: contribute to the **adaptation to climate change** of Sub-humid Med forests by increasing their **resilience**, ensuring their **conservation** and enhancing their **productive, environmental** and **social** functions



Project consortium:

CTFC



Generalitat de Catalunya
Departament d'Agricultura,
Ramaderia, Pesca i Alimentació



Centre de la Propietat
Forestal

serra de bellmunt
associació de propietaris forestals



ASSOCIACIÓ DE PROPIETARIS FORESTALS
DEL MONTNEGRE I EL CORREDOR

2. LIFE MixForChange overview



Ripollès

Four working areas

Bellmunt-Collsabra massif

Montseny massif

Montnegre-Corredor massif

Four forest types

dominated by...

...Oaks (4 species, dark blue)

...Pines (3 species (*green*))

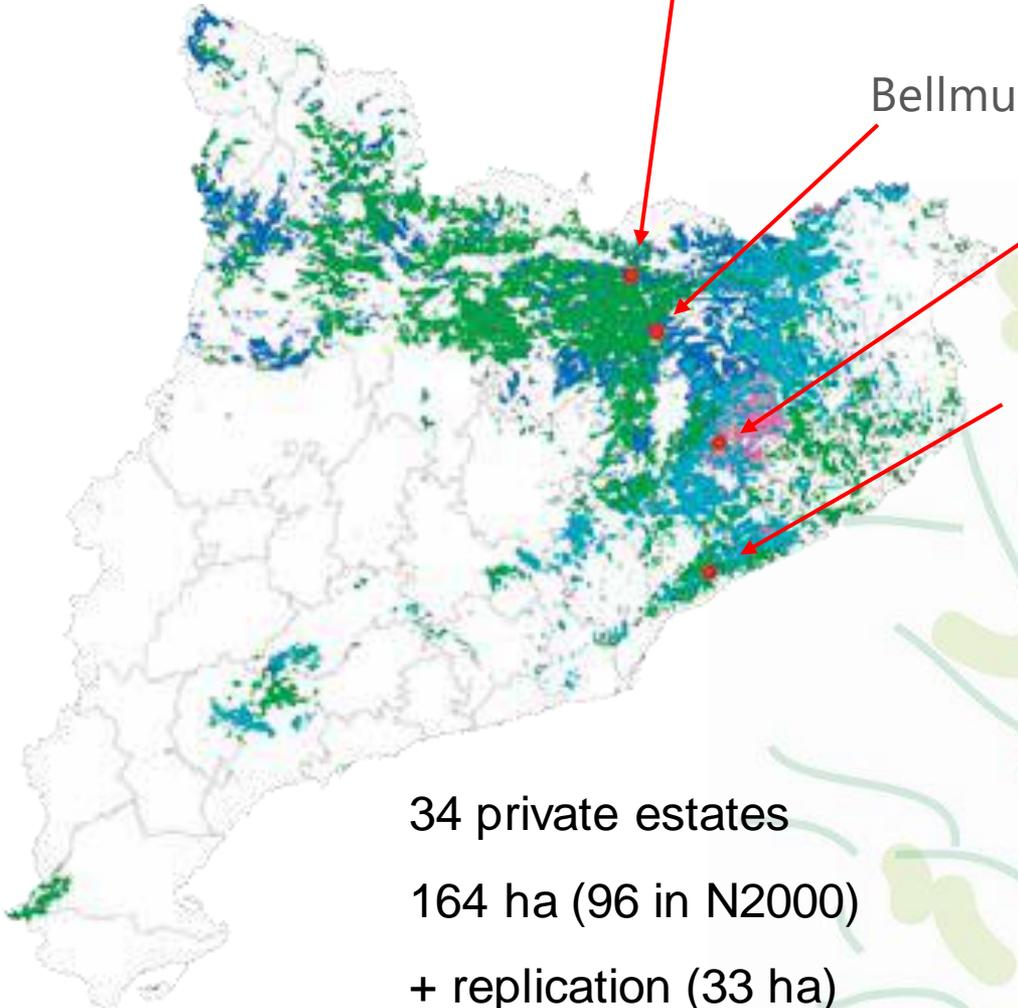
...Holm oak (pale blue)

...Chestnut (*pink*)

34 private estates

164 ha (96 in N2000)

+ replication (33 ha)



2. LIFE MixForChange overview



Oak forests

Quercus pubescens, *Q. petraea*,
Q. canariensis, *Q. robur*

Pine forests

Pinus sylvestris, *P. pinea*, *P. pinaster*



3. Axis 1: innovative silviculture



Axis 1 - Develop, implement (164 ha)
and transfer innovative, adaptive silviculture

Aim: promote forest resilience



Main silvicultural principles:

- A. Promoting complexity: species & structures
- B. Reduce vulnerability to forest fires (fuel management), other threats (high vitality)
- C. Close-to-nature* + Tree-oriented* principles = high-precision silviculture

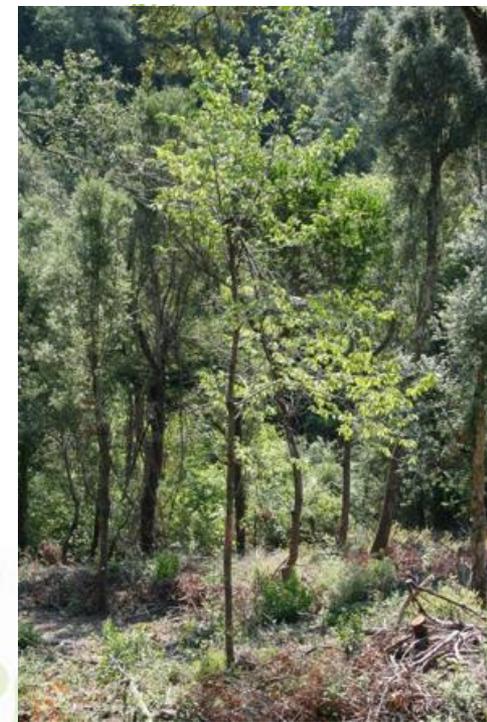
* Innovative in Med conditions

3. Axis 1: innovative silviculture

A. Promoting complexity

Keeping all species present (trees + shrubs)
Support to sporadic species

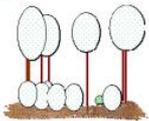
HIGHER TREE + FOREST RESILIENCE



B. Reduce vulnerability to forest fires and other threats

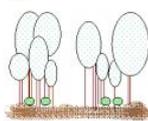
TIPUS D'ESTRUCTURES DE VULNERABILITAT BAIXA AL FOC DE CAPÇADES

C1



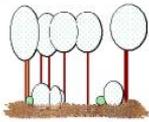
- PF: > 10 cm
- RCE: > 70%
- De-a: > 4 m
- Df-e: qualsevol
- FCC: 30-70%

C2



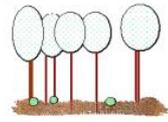
- PF: > 10 cm
- RCE: 25-70%
- De-a: < 4 m
- Df-e: > 1,5 m
- FCC: 30-70%

C3



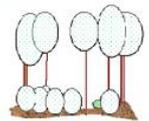
- PF: > 10 cm
- RCE: 25-70%
- De-a: > 4 m
- Ds-e: qualsevol
- FCC: qualsevol

C4



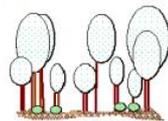
- PF: > 10 cm
- RCE: 0-25%
- Df-a: > 3 m
- Ds-e: qualsevol
- FCC: qualsevol

C5



- PF: < 10 cm
- RCE: > 70%
- De-a: > 3,5 m
- Df-e: qualsevol
- FCC: 30-70%

C6



- PF: < 10 cm
- RCE: 25-70%
- De-a: < 3,5 m
- Df-e: > 1 m
- FCC: 30-70%

Break vertical fuel continuity:

Promotion of healthy trees

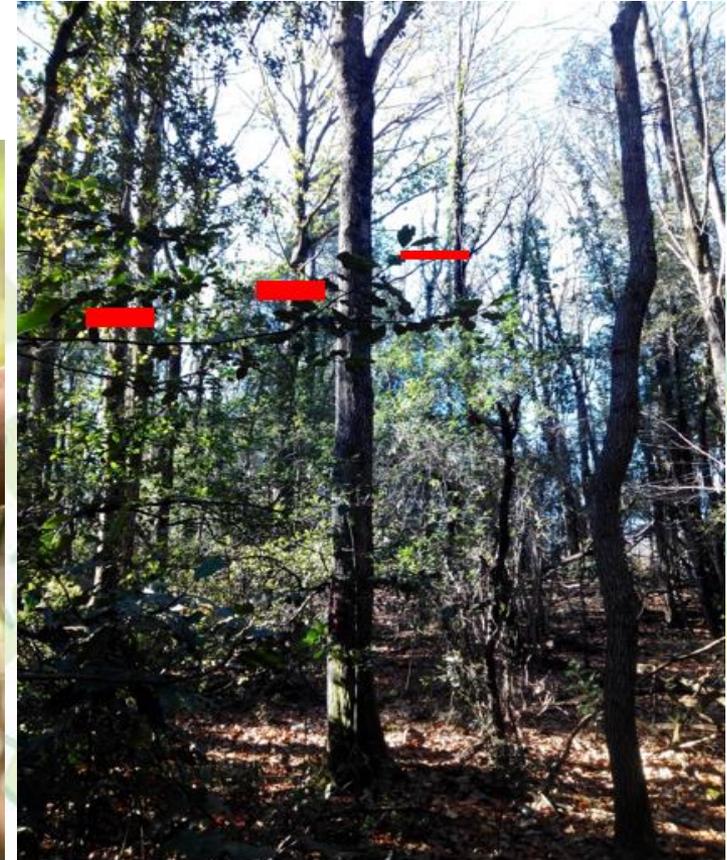
Density regulation: moderate thinning (25-30% BA)

3. Axis 1: innovative silviculture



C. High precision silviculture

Tree marking by qualified staff



Selective promotion of
future crop trees

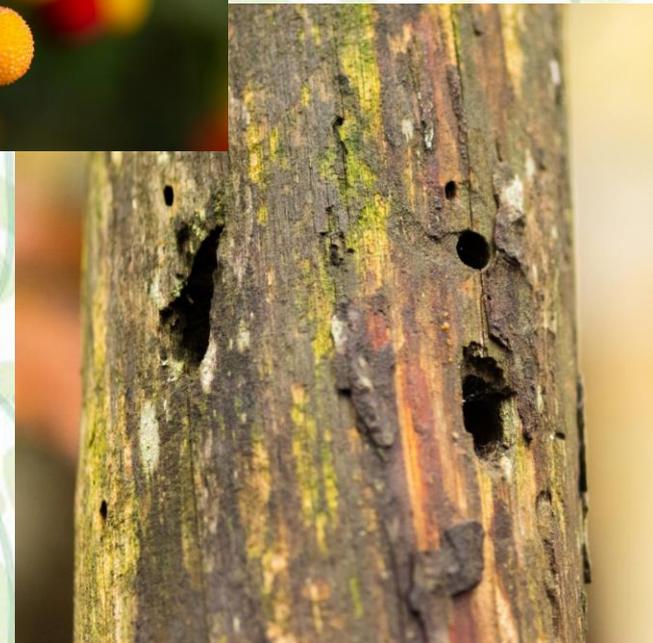
3. Axis 1: innovative silviculture



C. High precision silviculture

Keeping trees with high economic value

Keeping trees with high conservation value (including dead trees)



4. Axis 2: bioeconomy enhancement



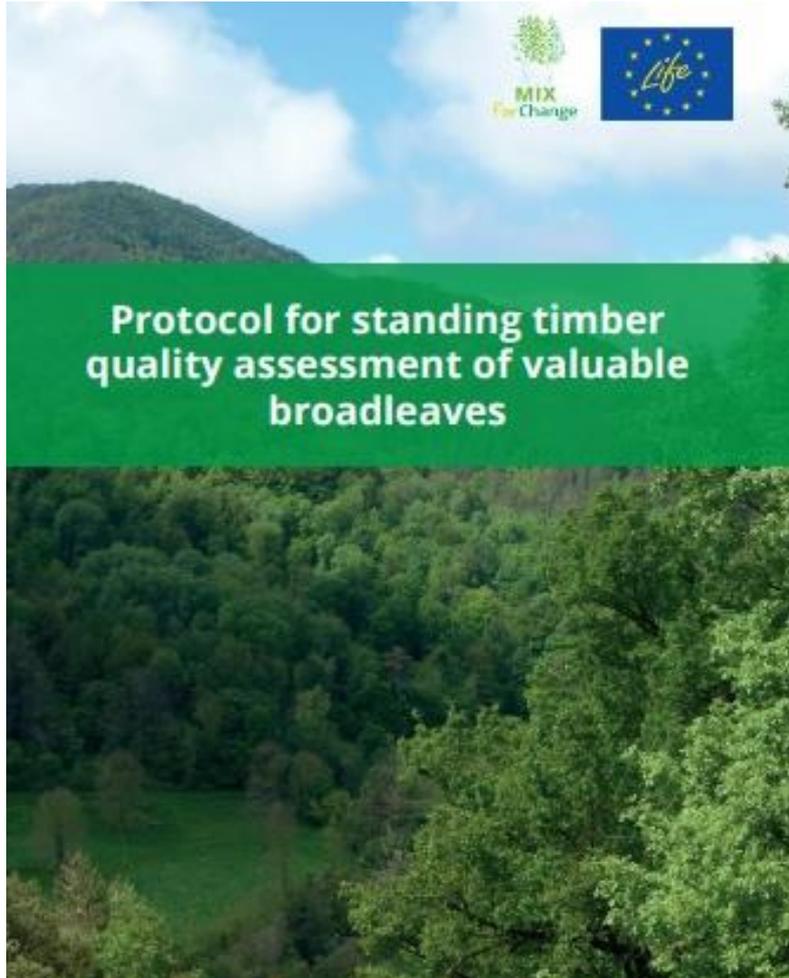
Axis 2 - Enhance the forest products bioeconomy

Aim: only an economically sustainable management can be mainstreamed



4. Axis 2: bioeconomy enhancement

USES OF VALUABLE BROADLEAVES TIMBER IN CATALONIA



Fusteria

La fusteria genera peces que es poden emprar directament (portes, finestres) o bé formar part d'altres elements constructius (escales) o de mobiliari. Es tracta, per tant, d'una activitat molt diversa i amb molta perfil·lització d'empreses que n'hi dediquen. Aquesta indústria pot emprar totes les espècies de frondoses esmentades, tot i que les més comunes són aquelles més abundants: roure, freixe i castanyer.

La fusteria és la principal indústria de transformació de la fusta de frondoses a Catalunya, i es troba molt diversificada. Alguns dels perfils d'empresa de fusteria més rellevants són: serradors que compren la fusta en roll i la venen en forma de taulons o listons; fabricants de peces intermedies per a altres indústries; fabricants de peces llestes per a instal·lar i fabricants – instal·ladors de peces a mida. CONFIRMAR



Torneria

El fonament de la torneria és treballar les peces de fusta fent-les girar a gran velocitat en un torn. El producte resultant té per tant una secció circular, ja sigui a una part o a la seva totalitat. Els principals elements fabricats per aquesta indústria són peces de mida intermèdia o petita per a l'elaboració de mobiliari (principalment, potes, baranes i balustres) o bé petites peces, eines i parts d'eines: tiradors, manes, joguines i miniatures, boarts o bollos, taps de cosmètics i begudes alcohòliques, pinzells i brotos, etc.

De les espècies esmentades al capítol anterior, aquesta indústria empra principalment fusta de freixe i castanyer (alguna més?), a més del faig.

Aquesta indústria té una llarga tradició a Catalunya, sobretot, a Osona. El teixit industrial actual consta principalment de petites empreses familiars... Alguna curiositat històrica (es feia el 70% dels boarts / es fa el 99% de taps de begudes / indústria cosmètica



Protocol for standing timber quality assessment

Catalogue of valuable broadleaves timber uses

+ economic study of innovative silviculture + pilot plan for forest products logistics

5. Axis 3: new tools for decision-making

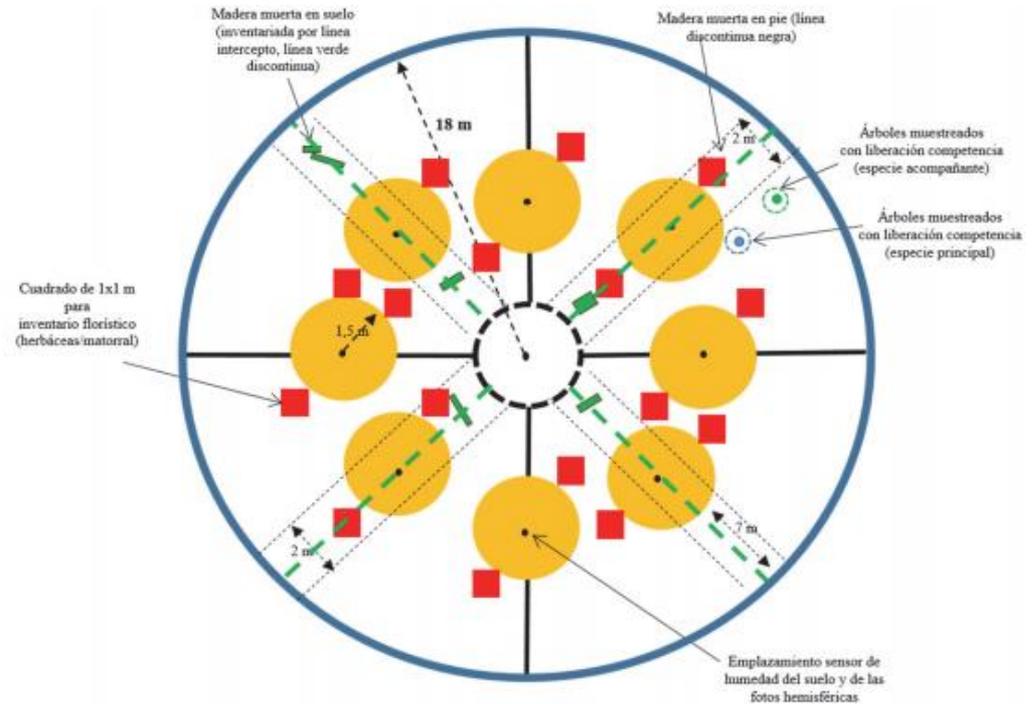


Axis 3 - Decision-making, policy and regulations

Aim: transfer and mainstream the innovative silviculture



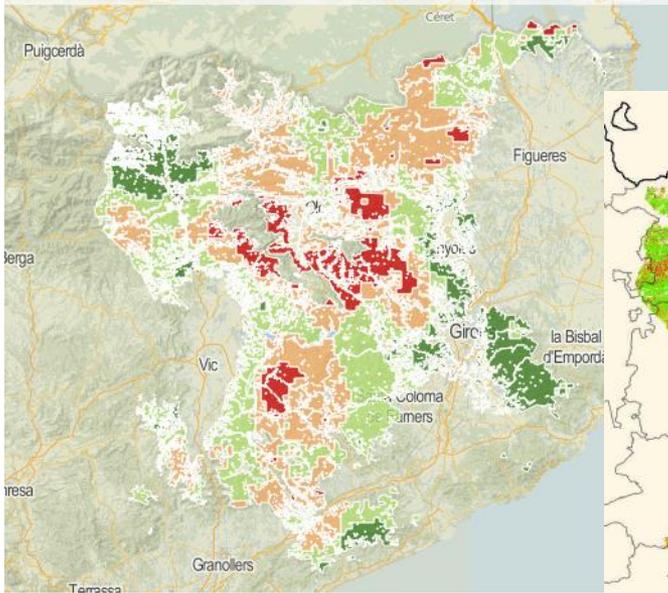
5. Axis 3: new tools for decision-making



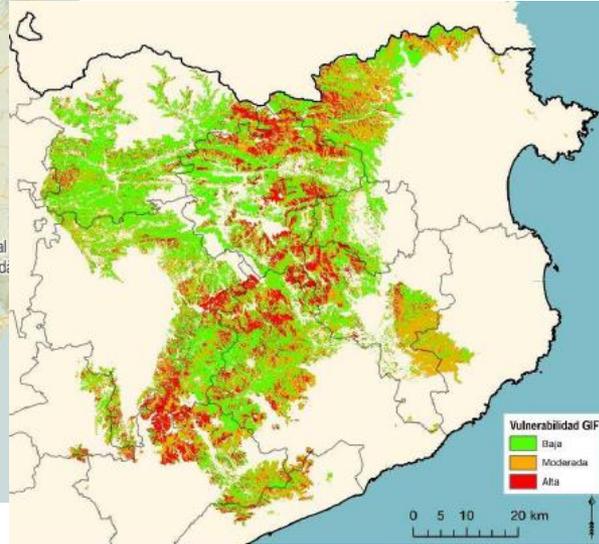
Monitoring indicators of CC impact and adaptation capacity (treated vs control stands):

- Vitality, pests and diseases occurrence
- Forest Biodiversity Index + flora + other biodiversity indicators
- Structural vulnerability to forest fires
- MedFate model on water balance in forest ecosystems
- Sensors of tree growth, soil moisture, forest microclimate

5. Axis 3: new tools for decision-making

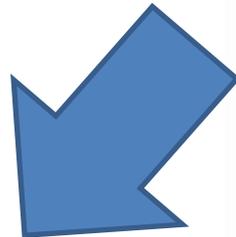


Vulnerability maps (drought + fire risk)



Dissemination,
networking,
+ training

- + changes in local/regional regulations
- + guidelines adaptive MED forest management



REPLICATION AT NATIONAL + EU (MED) LEVEL



Thank you for your attention

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