Day 5. Montnegre Corredor

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ASSOCIACIÓ DE PROPIETARIS FORESTALS DEL MONTNEGRE I EL CORREDOR

Day 5. Montnegre Corredor. Agenda. 18/3/2021

9:00 - Presentation of Montnegre Corredor Forest Owners Association

9:30 - Main Challenges:

- Cultural and socio-economic changes
- Climate Change (Jaume Olivella)

10:00 - Pause

10:15 - Disturbances:

- Fires (video by Asier Larrañaga, Wildfire Prevention Scales and Strategies)

- The case of Montnegre-Corredor:

    - Fires: Planning and adapting silviculture for fire prevention
    - Diseases (Tomicus destruens, matsococcus feytaudi, lymantria dispar, phytophthora quercina)
    - Storms

11:00 - Pause

11:30 - Examples of different actions that have been developed in MC

12:30 - Discussion (Asier Larrañaga, will be joining us)

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Presentation of Montnegre Corredor Forest Owners Association

General features

Non-profit private association founded in 1992, in 2017 a corporation was created

Technical team: Association: 1 manager, 1 forest engineer 1 accountant.
Corporation: 1 Manager 2 forest engineers 1 field technician

Associates: 190 forest owners and 8.000 forested hectares.
Associate typology: 95% private and 5% public
Area of action: Municipalities affected by Montnegre-Corredor Mountain range. 44.352 total hectares and 20 municipalities.

Objectives

- Representation of the members of the association
- Promotion of forest planning and more efficient management techniques
- Integration of multifunctional management and conservation of the environment guidelines
- Development of mechanisms for members co-operation
- Work towards a better understanding of the region

Work development

Common actions: representation and defense of our members' interests when dealing with the administration.
Forest management: forest planning, execution of forest works and commercialization of products.
Transfer of forest knowledge: development of innovation projects, meetings and conferences, publications, etc.

Challenges

- Improvement of silvicultural efficiency: diversification of products in quality and quantity
- Disturbance adaptation: plagues, climate change and forest fires
- Diversification of commercialization: new markets.
- Generation of knowledge: increase the innovation projects and transfer of knowledge

Presentation of Montnegre Corredor Forest Owners Association

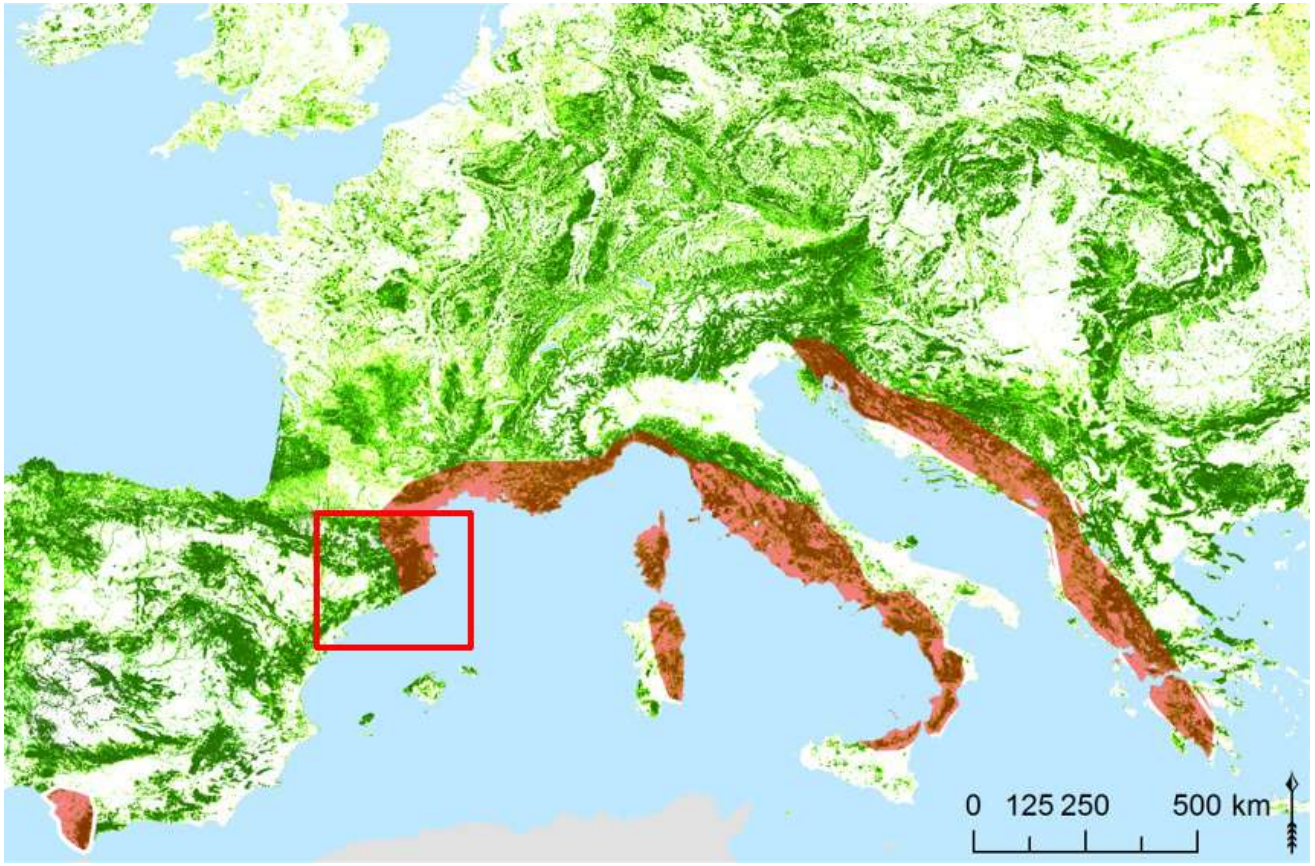
- Annual Investments 2020:
  - Association 380.000 eur

    (260.000 Public investment in fire and disease treatments, meanly coming from Barcelona Province Government, 100.000 knowledge and innovative transference programs (EU and Catalan programs)
  - Corporation 590.000 eur

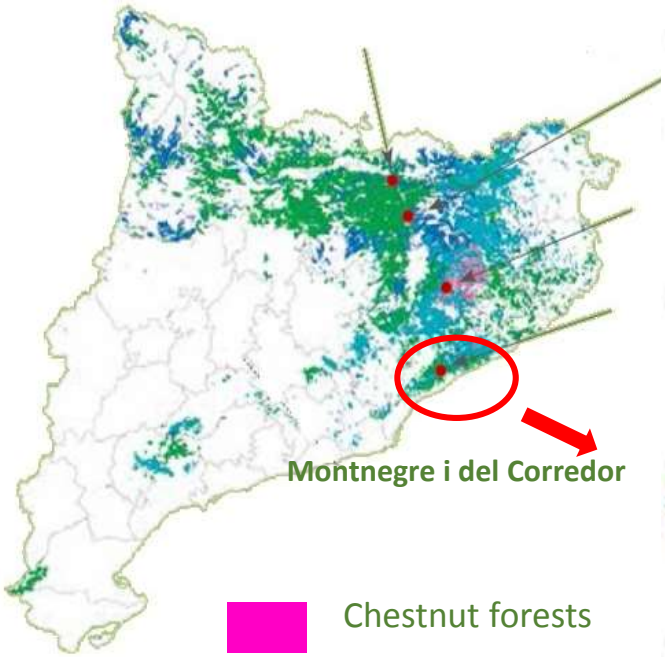
    (30.000 Public investment for primary sector promotion)

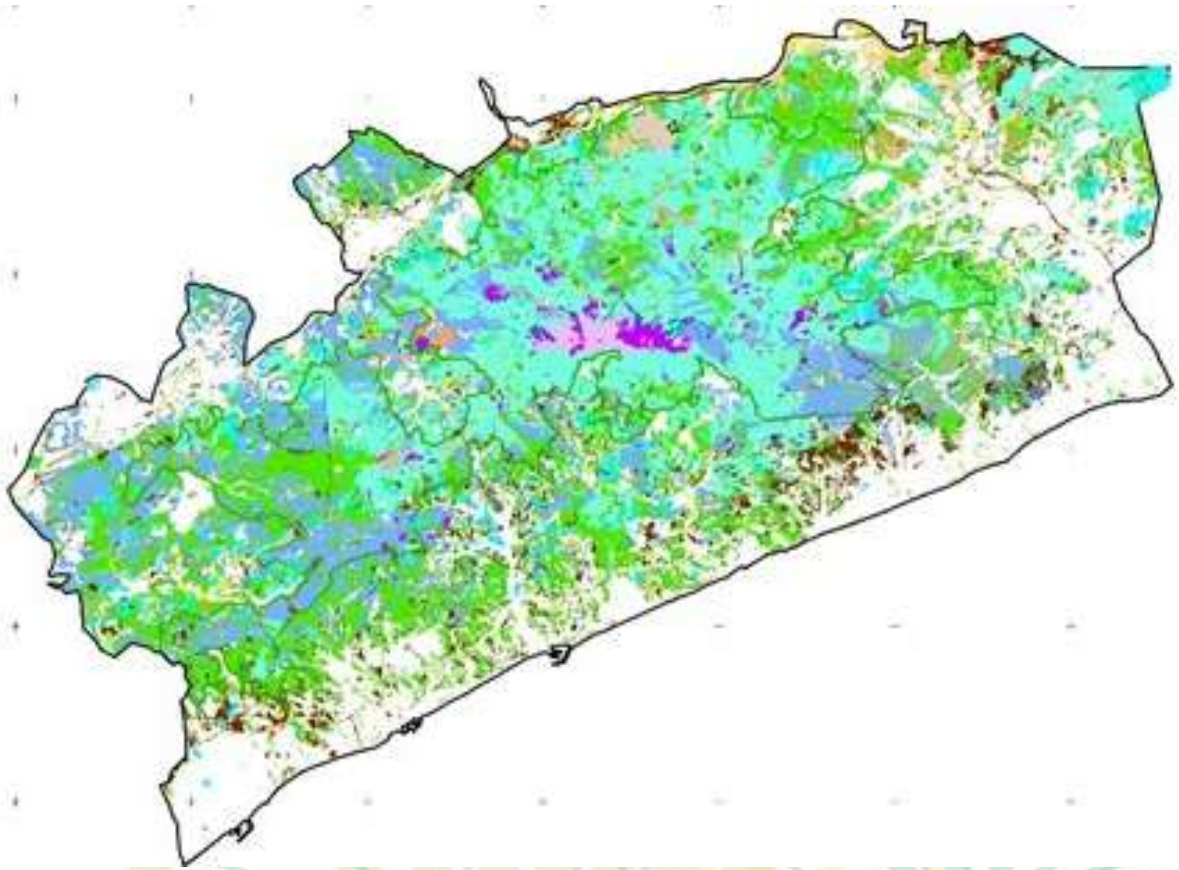
- 8.600 tn of wood, firewood and pallets
- 400 ha of silvicultural treatments

Subhumit Mediterranean forest



Main speices





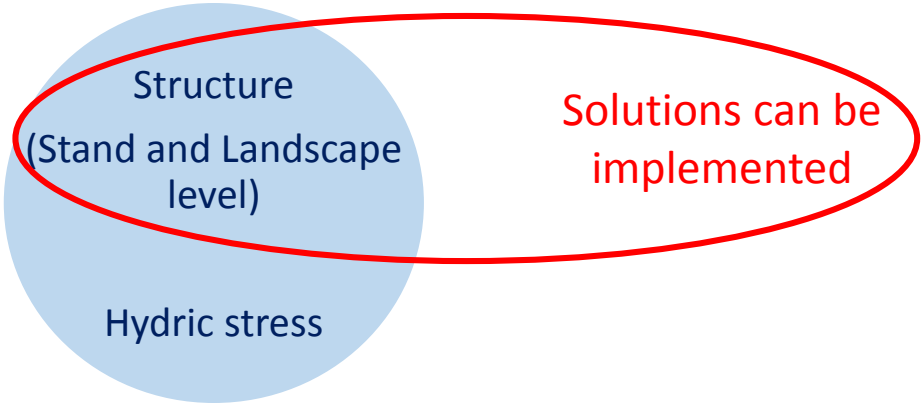
- Chestnut forests
- Pine forests
- Holm Oak forests
- Holm oak forests
- Oak forests

Humit Oak (Quercus canariensis and Q robur) Forest

Pinus pinea forest in a WUI (Wildland Urban Interfase) ubication

WHERE WE ARE

Challenges Effects Disturbances



Solutions:

- Thinning
- Change combustible structure
- Mixed Forest
- Landscape (open spaces have to be maintained…livestock)

How to implement and promote:

- Demostrative samples
- Planification
- Knowledge transference and promotions (dissemination, conferences, media etc.)

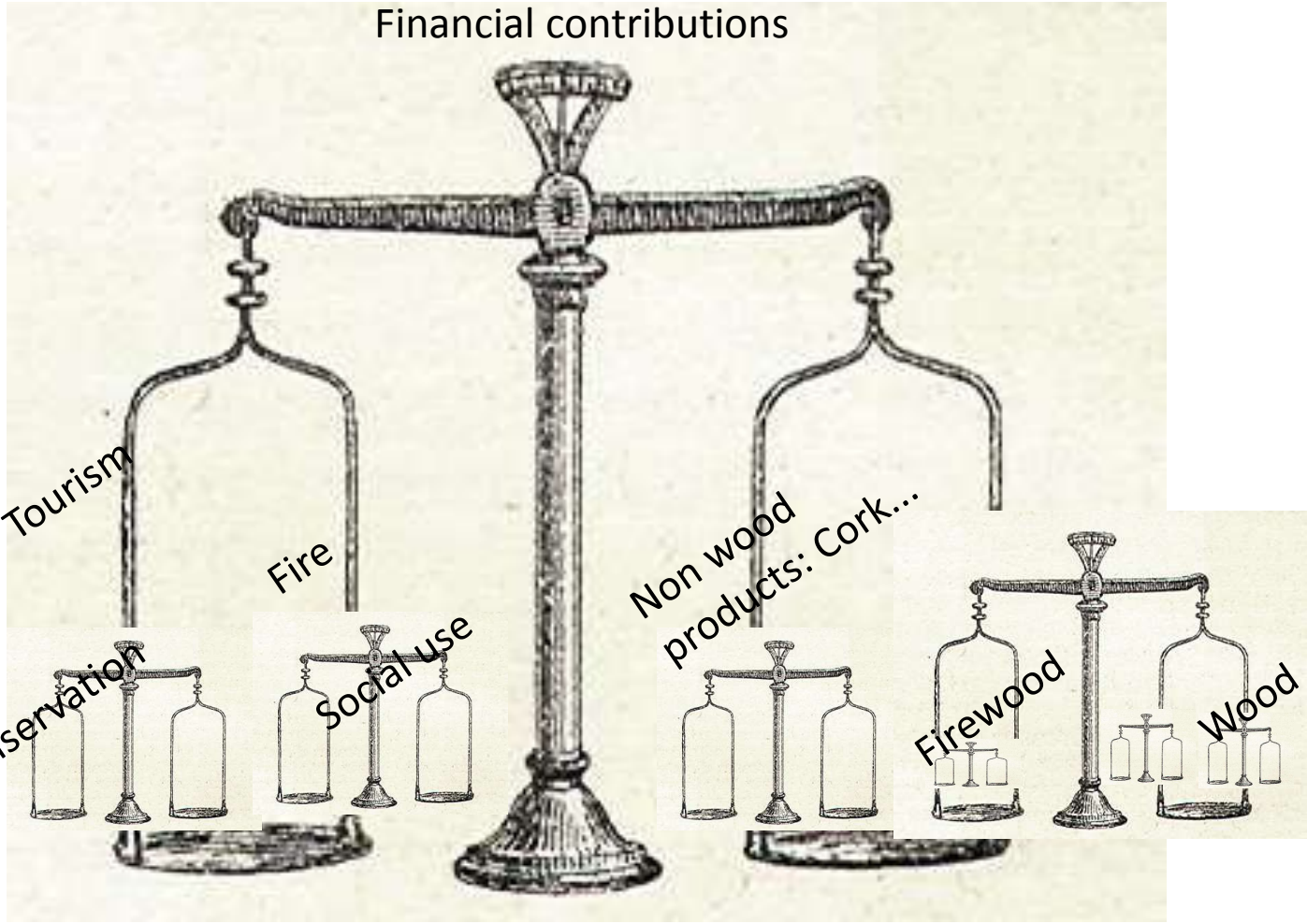
Challenges for implantation:

- Costs, investments
- + Incomes
- Insecurities (legal, restrictions, disturbances) in plantations, foreign species
- Need of grants and public investment

Cultural and Socio-economic changes

Economical approach

Economic Balance of The Management of a Forest property



A compendium of balances and activities !!!

The Catalan Office for Climate Change

Generalitat de Catalunya
Government of Catalonia
Ministry of Territory and Sustainability

a, 12th March 2021

Climate change impacts in Catalonia: water, forest and land use

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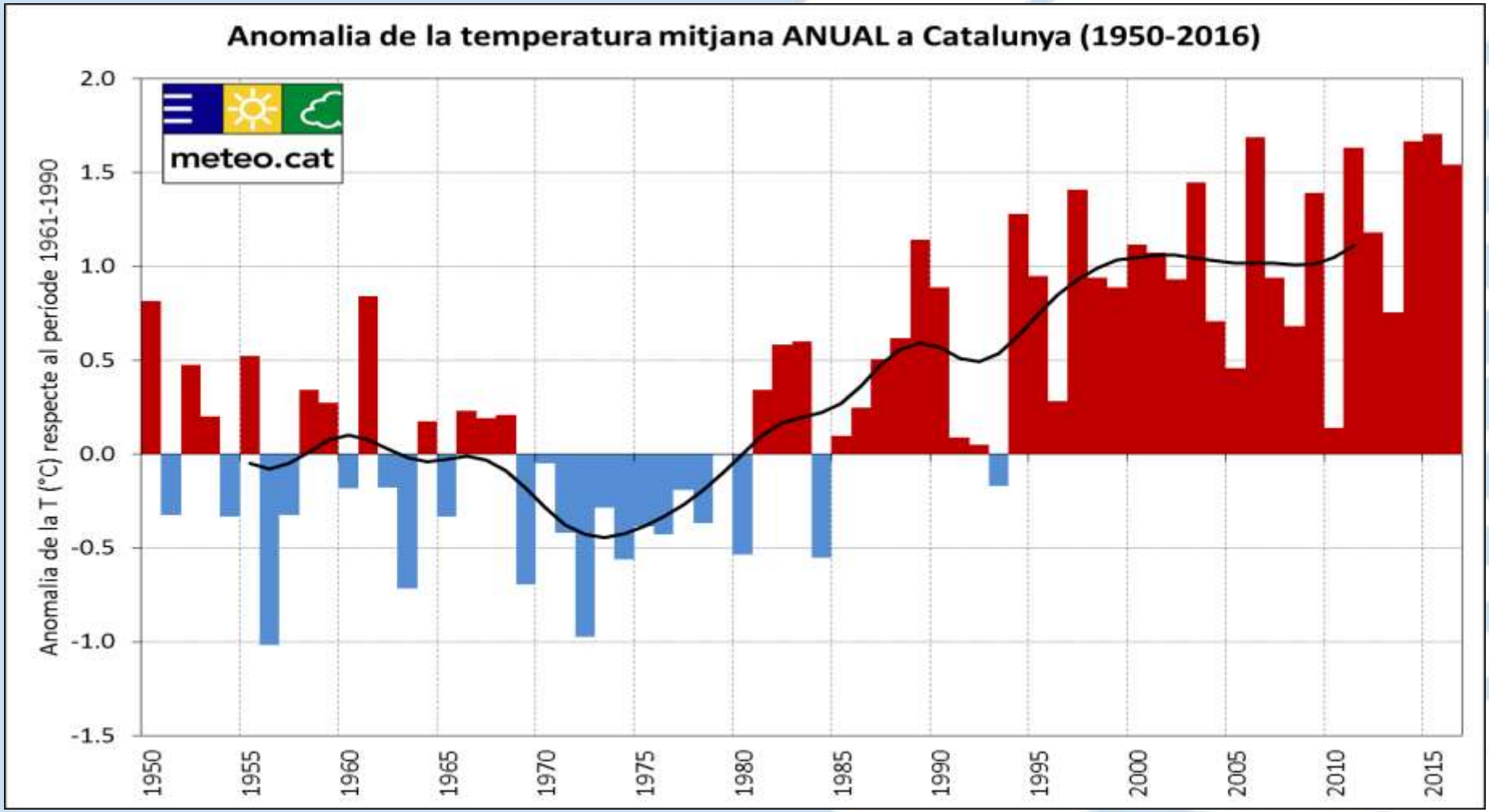
CTFC

Oficina Catalana del Canvi Climàtic

Catalonia

➢ General trends

+ 0,25ºC per decade (+0,35ºC in summer): +1,7ºC from 1950



Catalonia

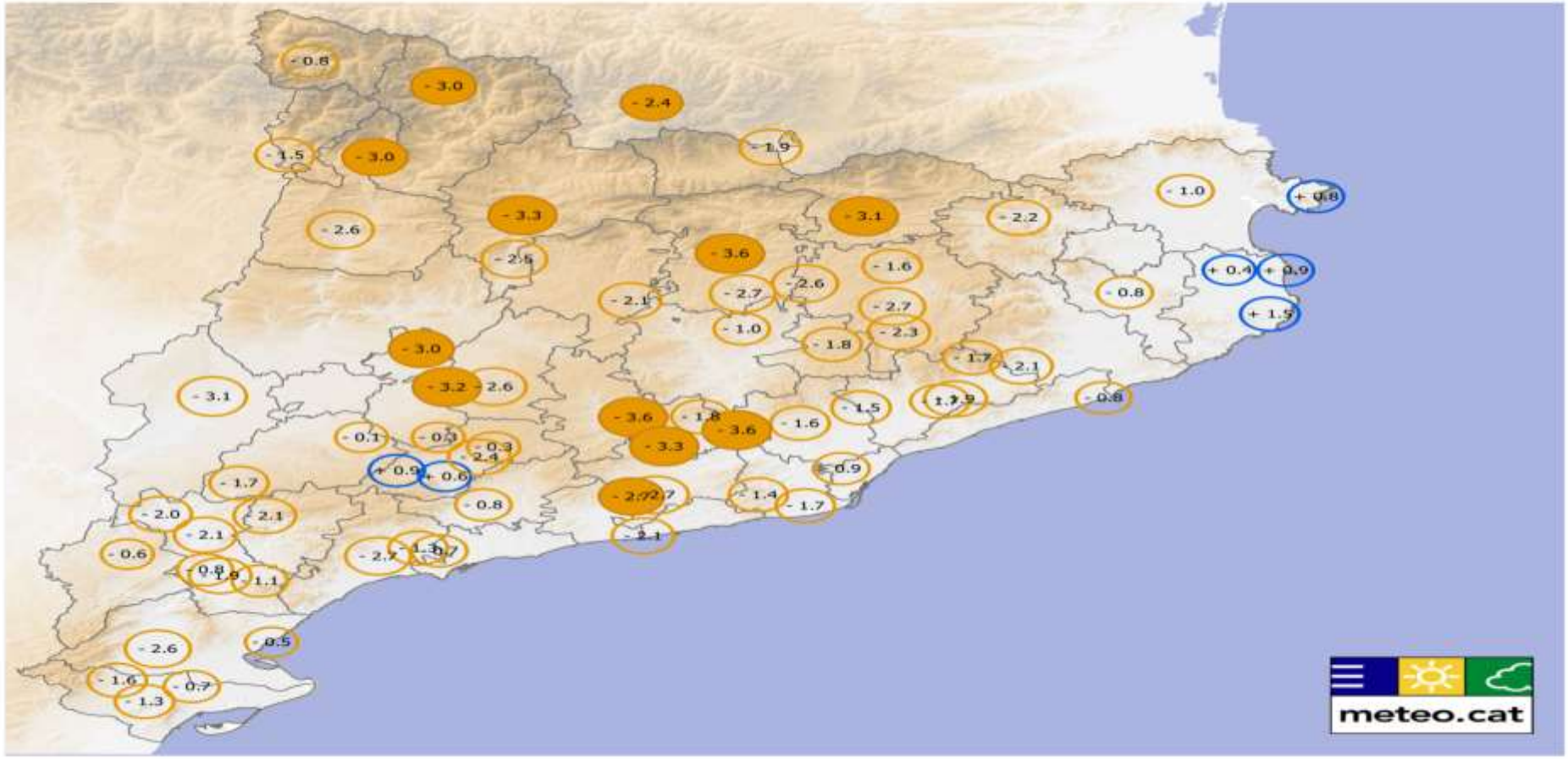
➢ General trends

An increase of 2ºC in the annual average of temperature …
is similar to the gap in the annual average of temperature between the cities of Barcelona and Sevilla.

Catalonia

➢ General trends

-1,7% per decade (-3% per decade in Pyrenees)



L'àrea dels cercles representa el percentatge de canvi per dècada.
Precipitació: blau = positiu, taronja = negatiu
Cercle sòlid indica tendència estadísticament significativa: p < 0.05

Catalan Strategy Adaptation to Climate Change (ESCACC, 2013-2020)

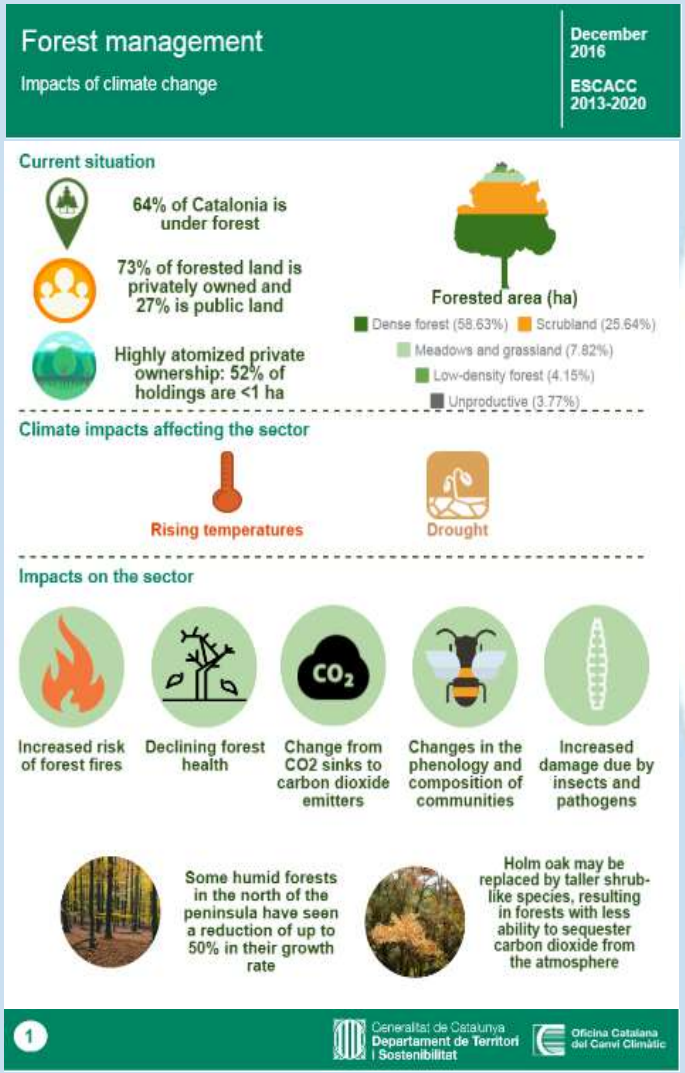
Conclusions ESCACC main climatic impacts:
Temperatures increase and heat waves. Most irregular precipitations.

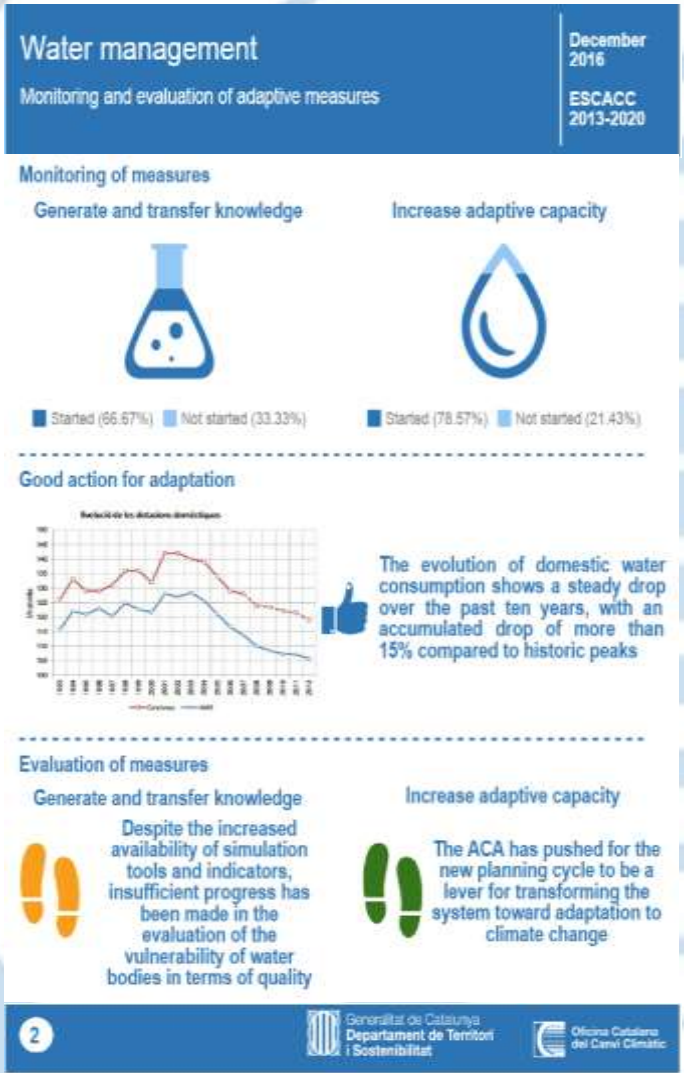
Conclusions ESCACC most vulnerable areas and system:
Pyrenees (mountain region) and Ebro's Delta (litoral) and Water

Public / Private sector :
Private sector awareness and action are generally low.
Public sector is crucial to guarantee policy coherence across many sectorial policies (mainstreaming) helping to ensure its effectiveness and efficiency

2016 Evaluation & Monitoring Catalan Strategy for adapting to climate change

Infographic impacts, assessment and evaluation of Catalan Strategy Adaptation Climate Change





Climate change considerations on environmental impact assessment

Climate change adaptation on sectorial planning

Agriculture livestock

Water management

Biodiversity

Forest management

Energy

Industry

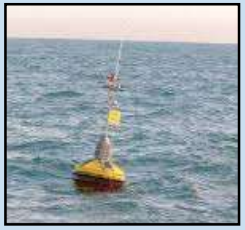
Infrastructure

Waste

Transport and mobility

Health

Turism



RDI

Urbanism

Some specific adaptation projects

More detailed information in the websites

Life Medacc
http://medacc-life.eu/

Life Climark
https://lifeclimark.eu/?lang=en

Some specific adaptation projects

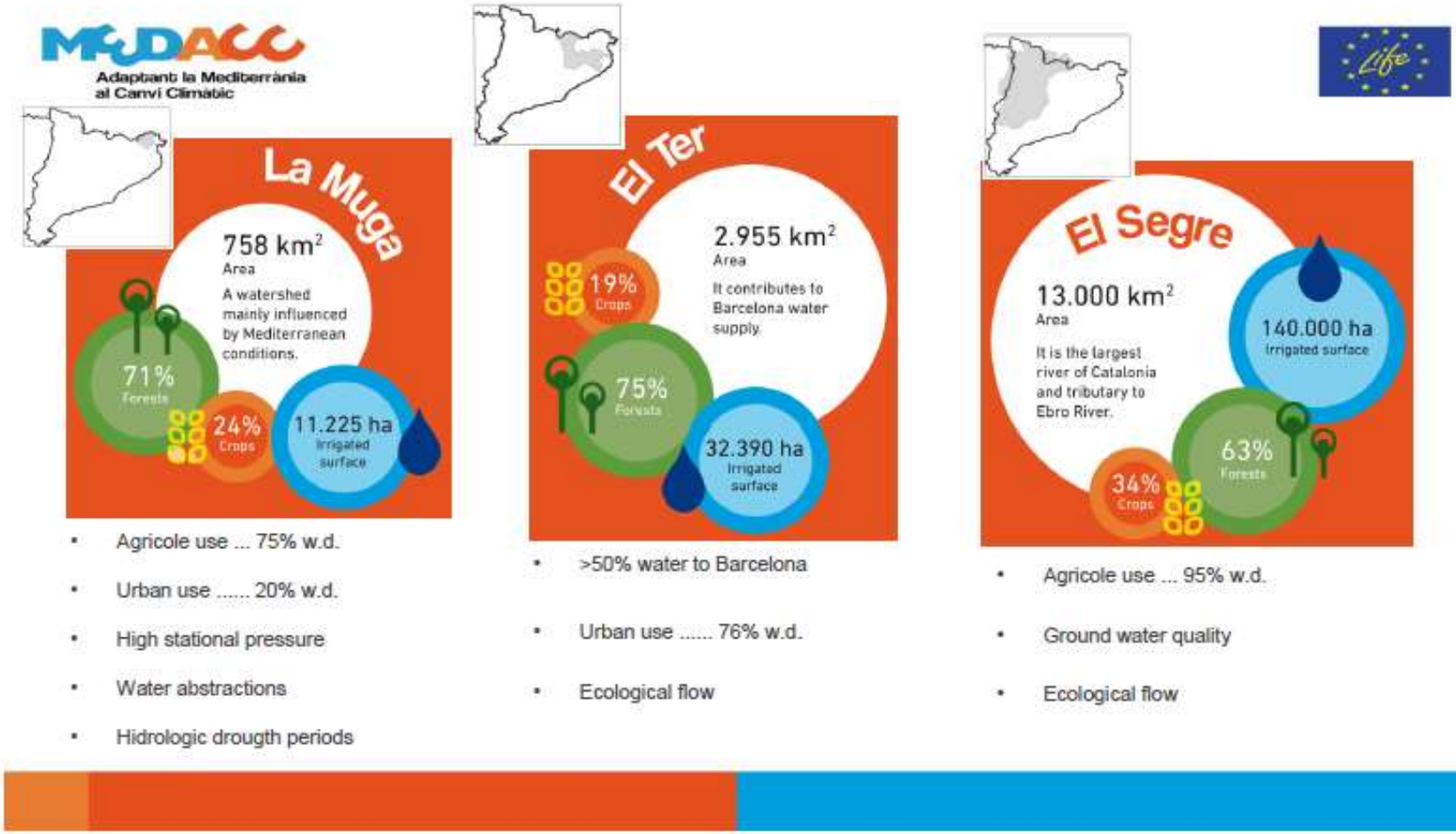
MEDACC
Adaptant la Mediterrània al Canvi Climàtic

Project

MEDACC is a 5-year **LIFE+** project where some innovative solutions **will be tried** to **adapt** the **agroforest** and **urban** systems to the climate change impacts through demostrative actions in three basins of Catalonia.

Oficina Catalana del Canvi Climàtic
CREAF
IRTA
IPE CSIC

Some specific adaptation projects

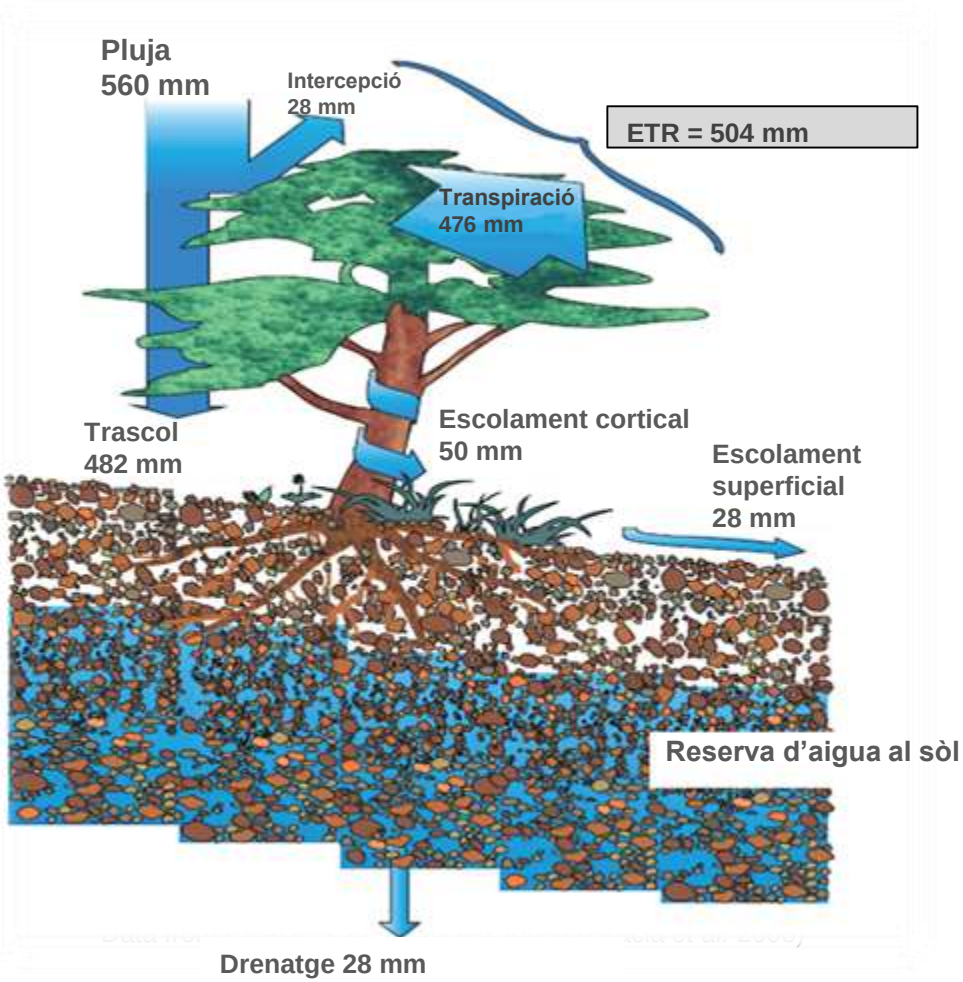


- Agricole use ... 75% w.d.
- Urban use ..... 20% w.d.
- High stational pressure
- Water abstractions
- Hidrologic drougth periods

- >50% water to Barcelona
- Urban use ..... 76% w.d.
- Ecological flow

- Agricole use ... 95% w.d.
- Ground water quality
- Ecological flow

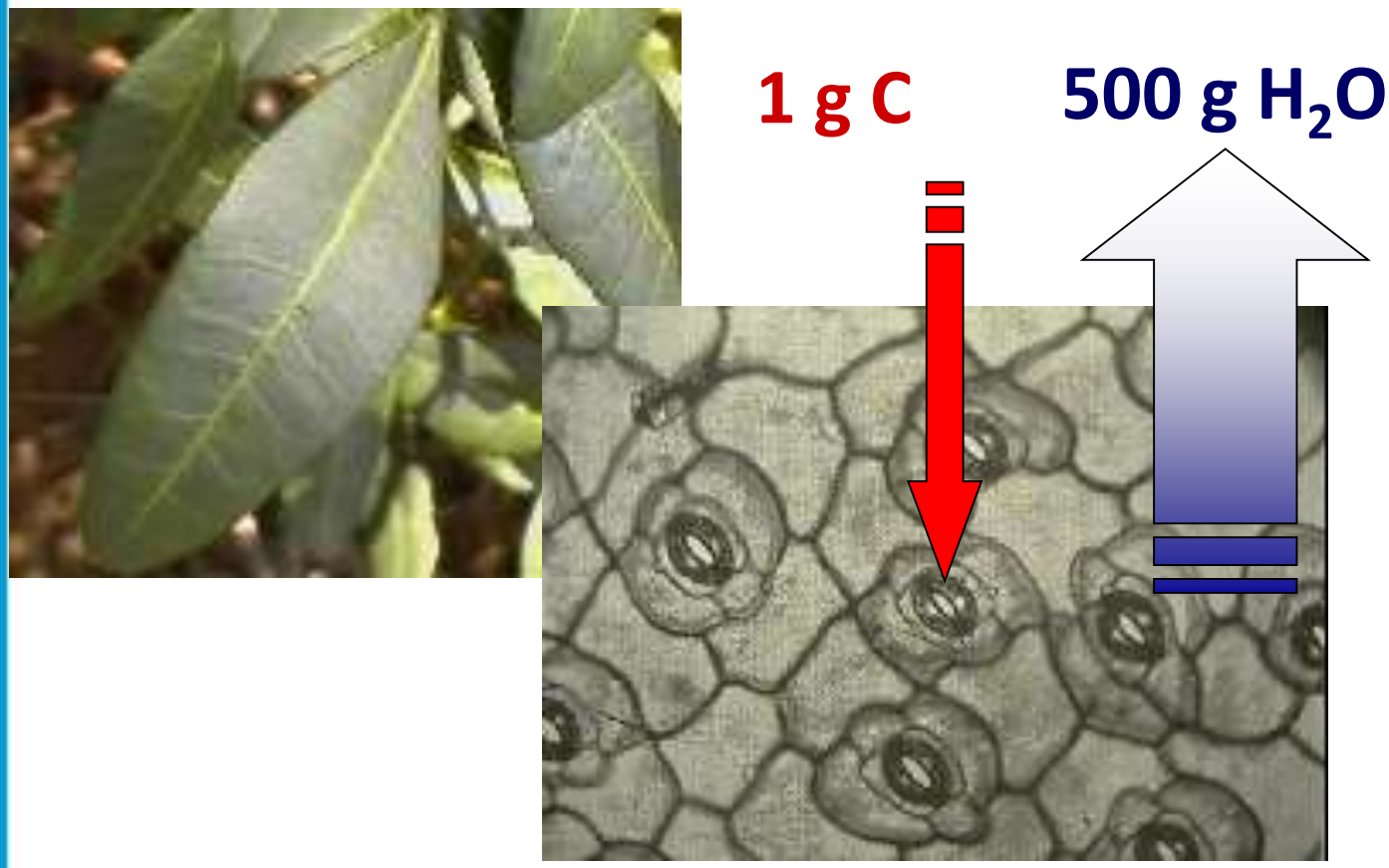
Evapotranspiration in mediterraean forests



Around 80-90% of precipitation is Green water and only between 10-20% is Blue water

Font: Dades de l'alzinar de Prades (Gracia *et al.* 1999)

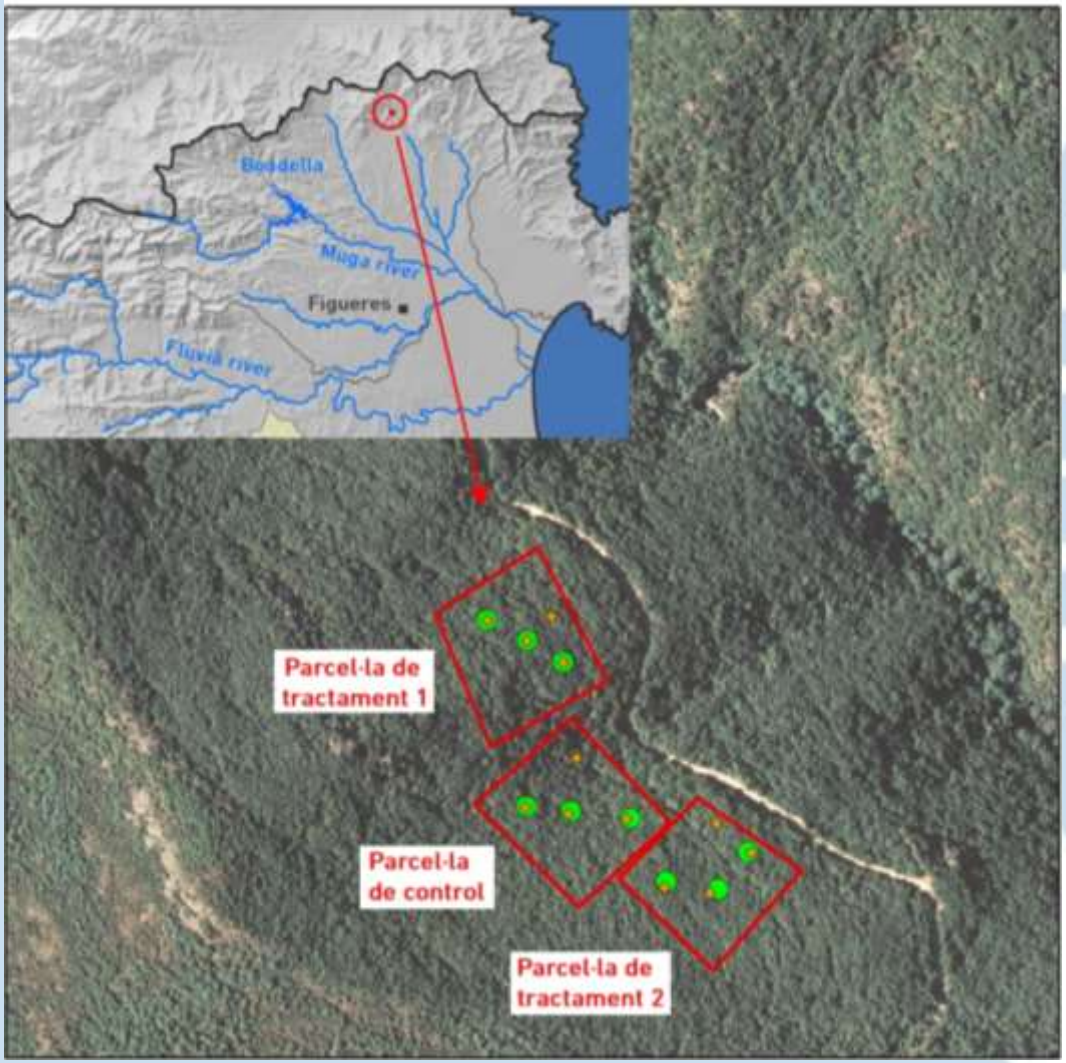
Carbon and water balances in mediterranean forests



The management of forests, without considering the water flows, is led to the failure

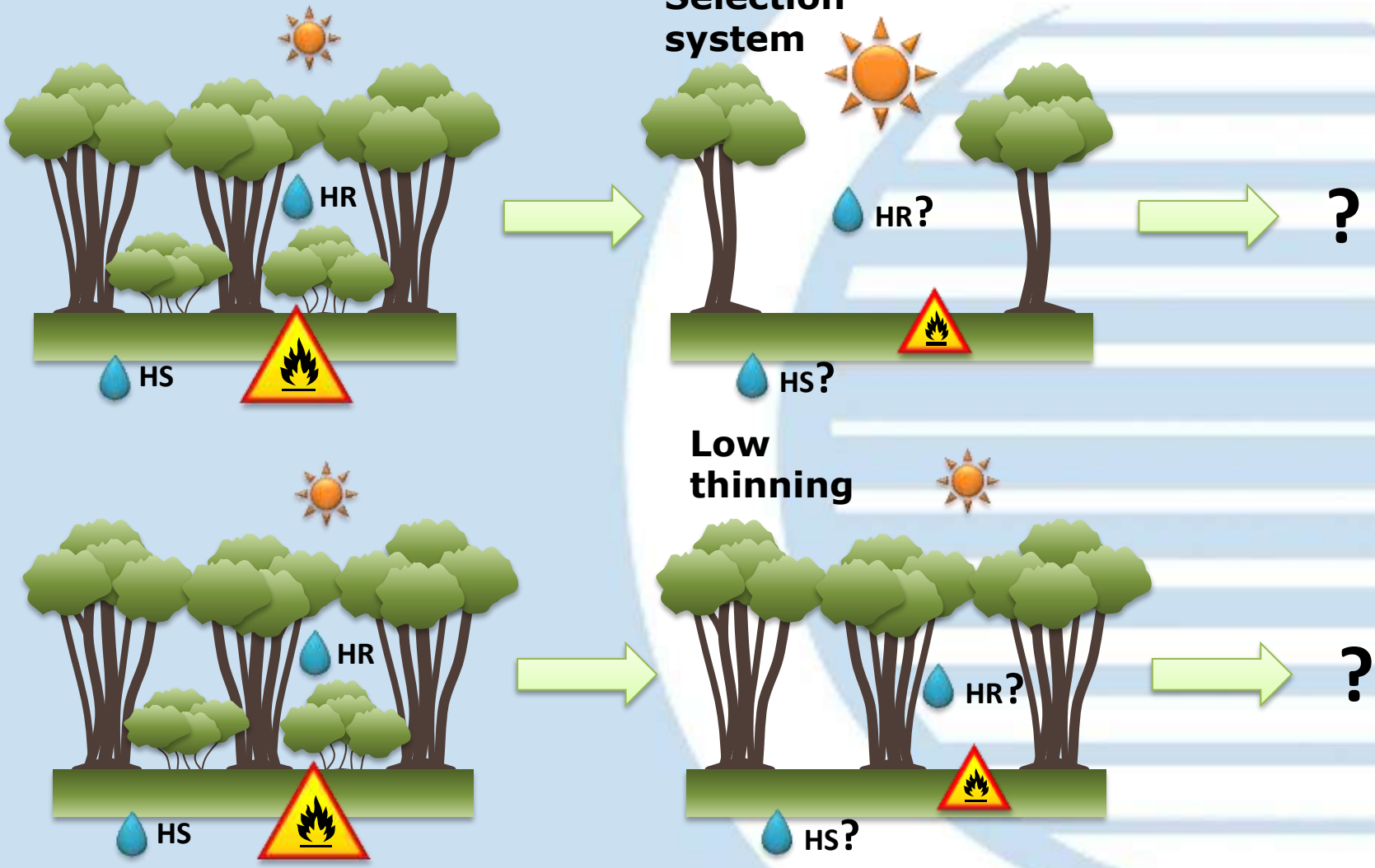
Font: Gracia *et al.* 2010. 2n Informe CC a Catalunya

Muga: Holm oak (*Quercus ilex*) in the **Requesens estate** (PNIN l'Albera, Alt Empordà)



Life – Medacc remarkable action.

Objective: To reduce risk of fire


Selection system
HR
HS
HR?
HS?
?
Low thinning
HR
HS
HR?
HS?
?

4.- Some specific adaptation projects

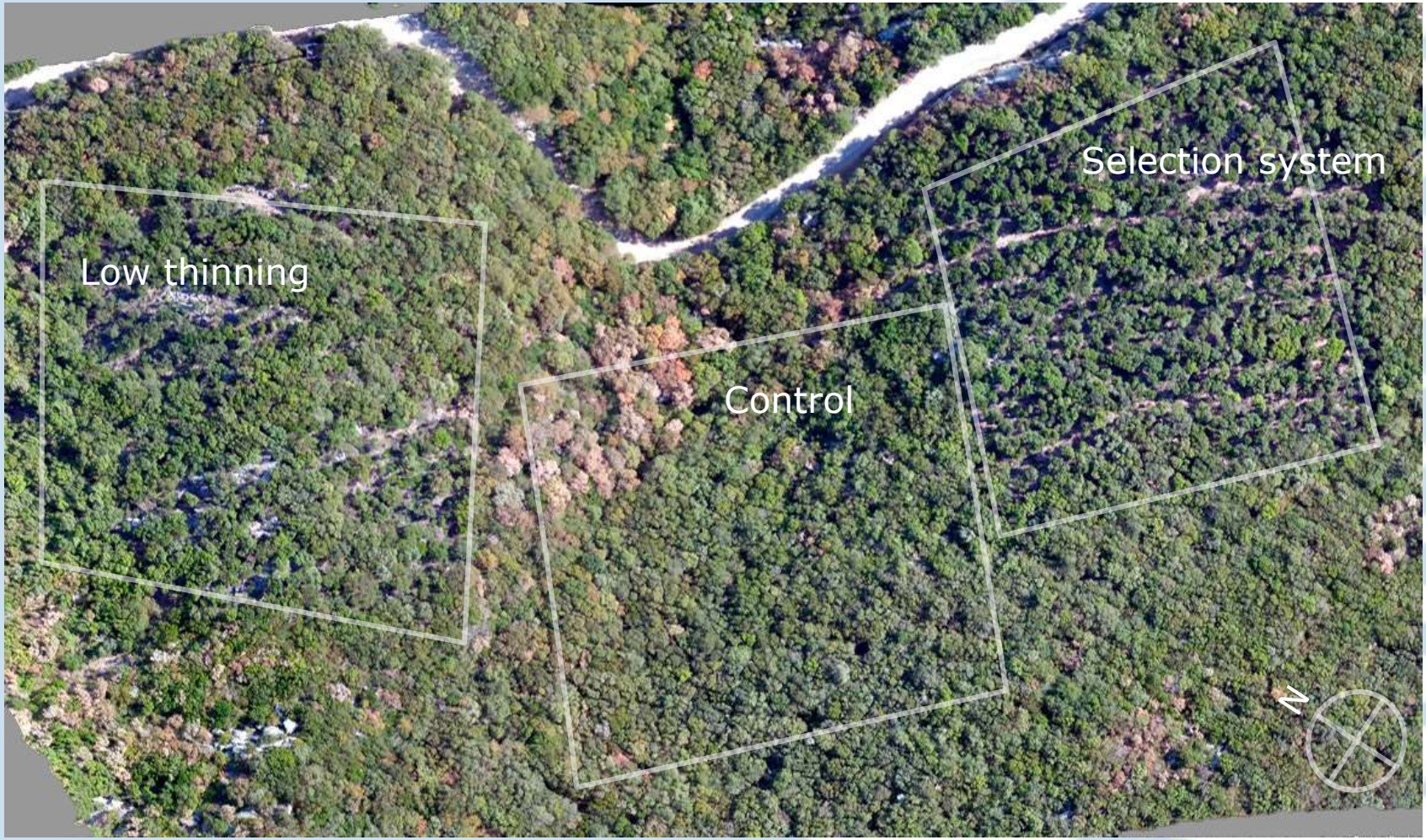
T2
Selection system

T1
Low thinning

Requesens. June 2012

Requesens. June 2015

Requesens. October 2016



Response to thinning and selection systems in white pine masses regenerated after fire: the three pins of the photo (2018) were born after the 1986 fire. They have, therefore, the same age:

-The largest was born out of a crop, alone, without competition. Medium and small in very dense masses, up to 60,000 feet / ha.

-The smallest belongs to a mass of white pine where there has never been any action.

-The medium is from a restored forest with thinning, in 2005, in order to reduce the final density to 1,000 feet / ha.

https://lifemontserrat.eu/wp-content/uploads/2018/10/Article_Leire.pdf

Some specific adaptation projects

The main objectives of Life CLIMARK project are to **contribute to the mitigation of climate change** and increase the carbon sink capacity of Mediterranean forests by fostering the mitigating effects of multifunctional forest management through the creation of a climate credit market. The proposed multifunctional forest management is based on three pillars: carbon, water and biodiversity. The project is being implemented in Catalonia and is being replicated in the region of Veneto (Italy)

Some specific adaptation projects

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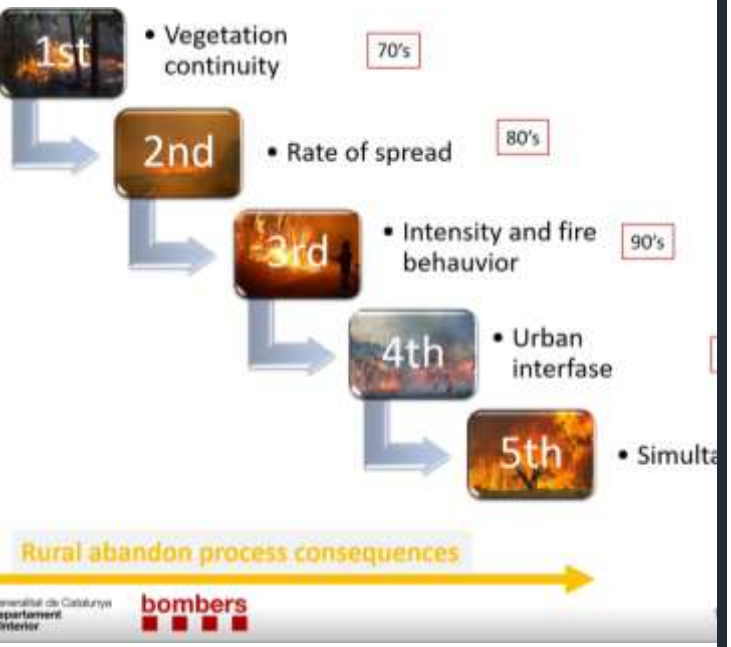
Fire Prevention Plan and new generations of fire



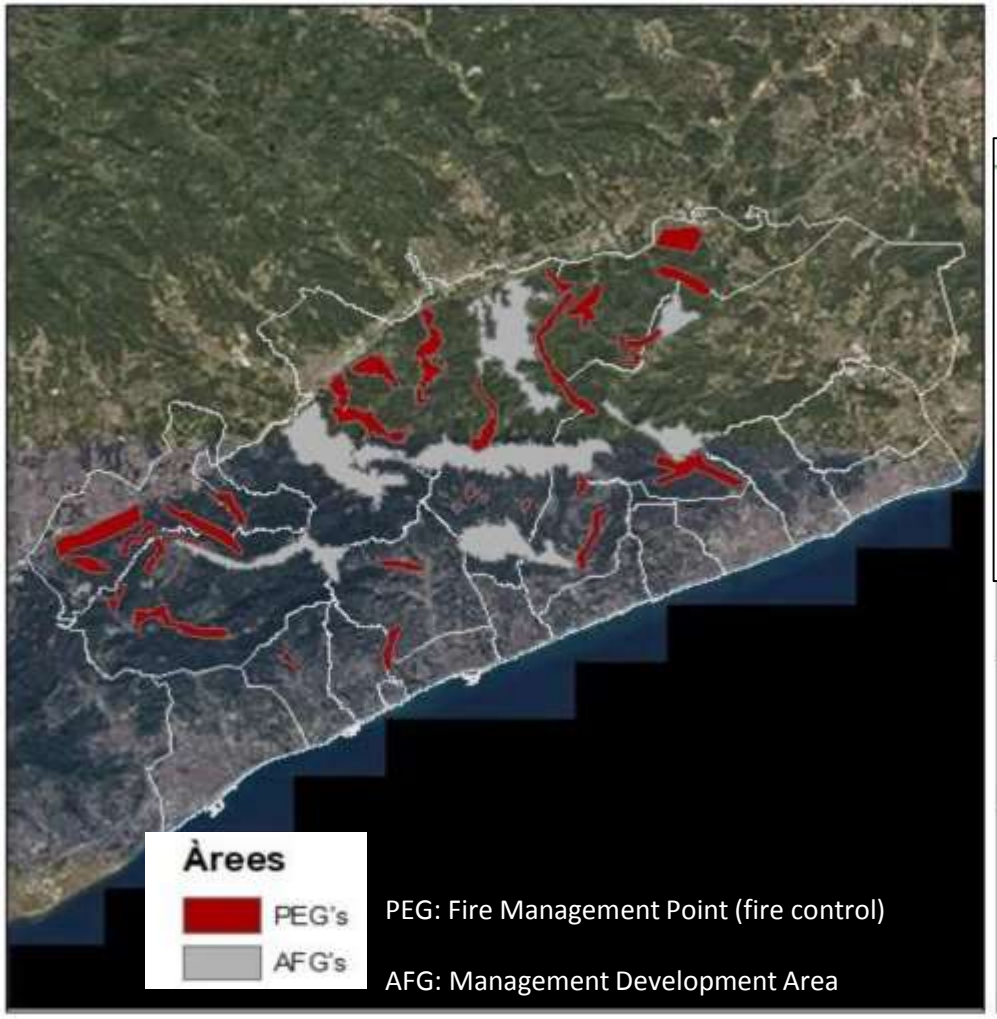
Usefull for previous generations of fire until 90's, now is not usefull for 3rd, 5th and 6th generation:

- spot fire (>25m)
- Convection fire
- Maintenance costs
- Lansacape

Fire Prevention Plan

New approach on fire prevention Planning:

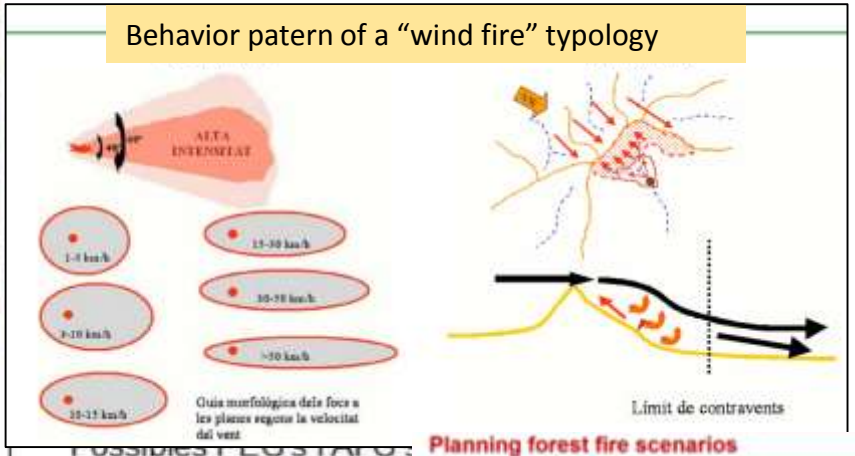
- Polygon (river basins) analysis
- Forest behavior typology (wind, topographic…)
- Operational opportunities
- Management opportunities
- Different infrastructures:
  - For firemen security
  - Fire control
  - Populated area protection
  - Change in fire intensity
  - Forest Resilience
  - Natural Values protection

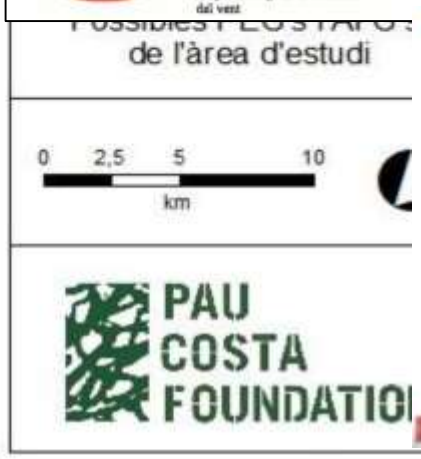


PEG: Fire Management Point (fire control)

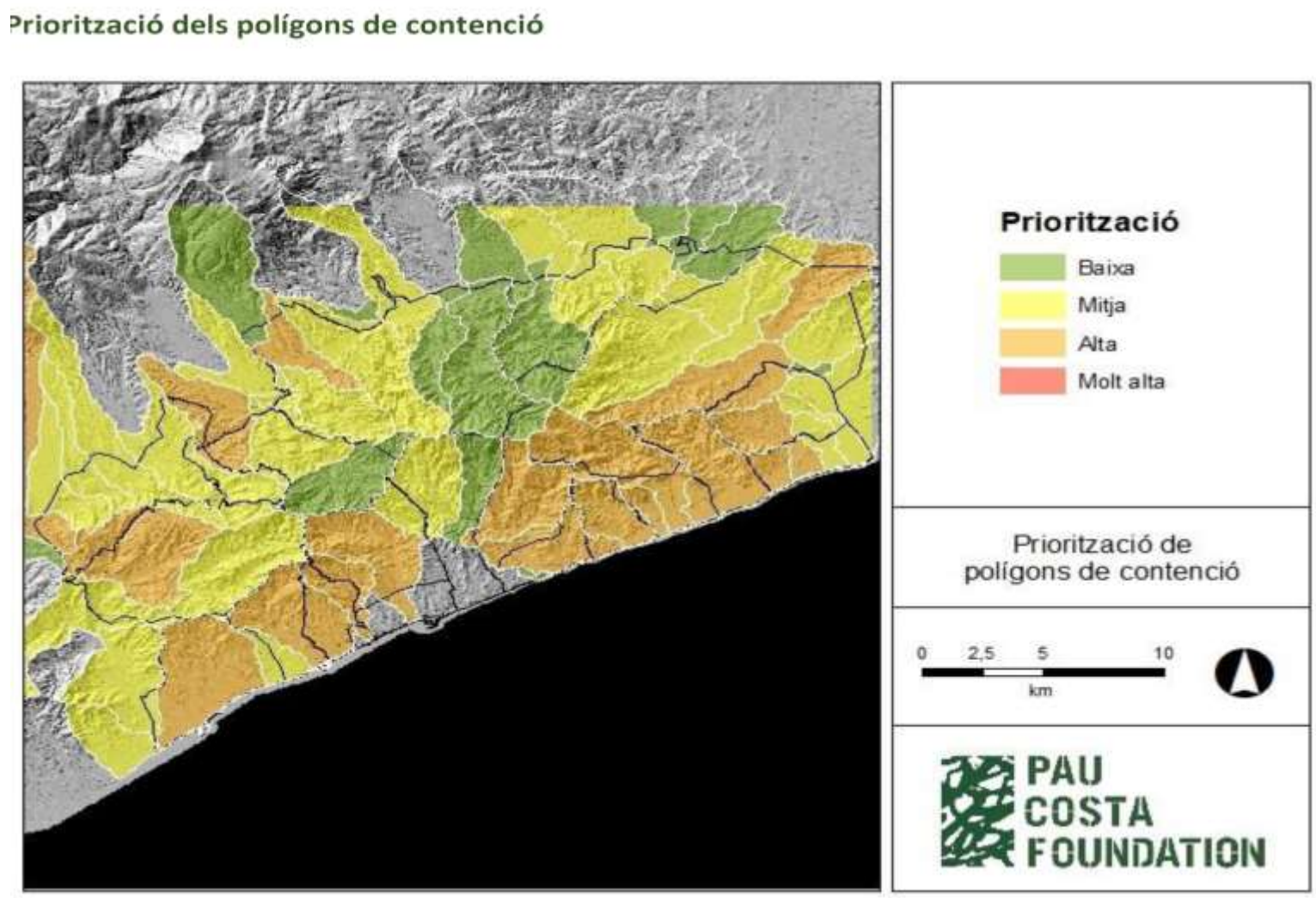
AFG: Management Development Area

Behavior patern of a “wind fire” typology





Fire Prevention Plan



Diseases

2000´s
Coraebus undatus

Cork Oak

2015 Tomicus destruens

Pinus pinea

2015
Matsococcus feytaudi

Pinus pinaster

2018
Lymantria dispar

Holm oak, Cork oak

2021
Phytophthora quercina

Cork Oak

Storms

Snowfall 2009

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- Can Bordoi: Implementation of a Fire Strategic Area.

  Species : Pinus pinaster, Pinus pinea, Quercus ilex, Quercus suber, Quercus

- Can Casas: Improve rentability and compatibility with conservation goals

  Species: Quercus canariensis, Quercus ilex, Quercus suber, Prunus avium,

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- Can Bordoi: Implementation of a Fire Strategic Area
  - Starting point:
    - Pinus pinaster plantations effected by matsococcus feytaudi
    - Pinus pinea , stressed (high competence) Tomicus destruens
    - Holm oak forests very dens, low pasture production
  - Main Objective: Create an opportunity to fight a high intensity fire
  - Secondary objectives: Disease control
    Improve pasture (oak seeds, and open pastures)
    Improve Resilience
    Demonstrative area
    - Operations:
      Fuel Discontinuity:
      a) Stand level:
         a) Thinning
         b) Debrushing
         c) Improve mixed forest
      b) Landscape Mosaic
         a) Create new open spaces (pastures)

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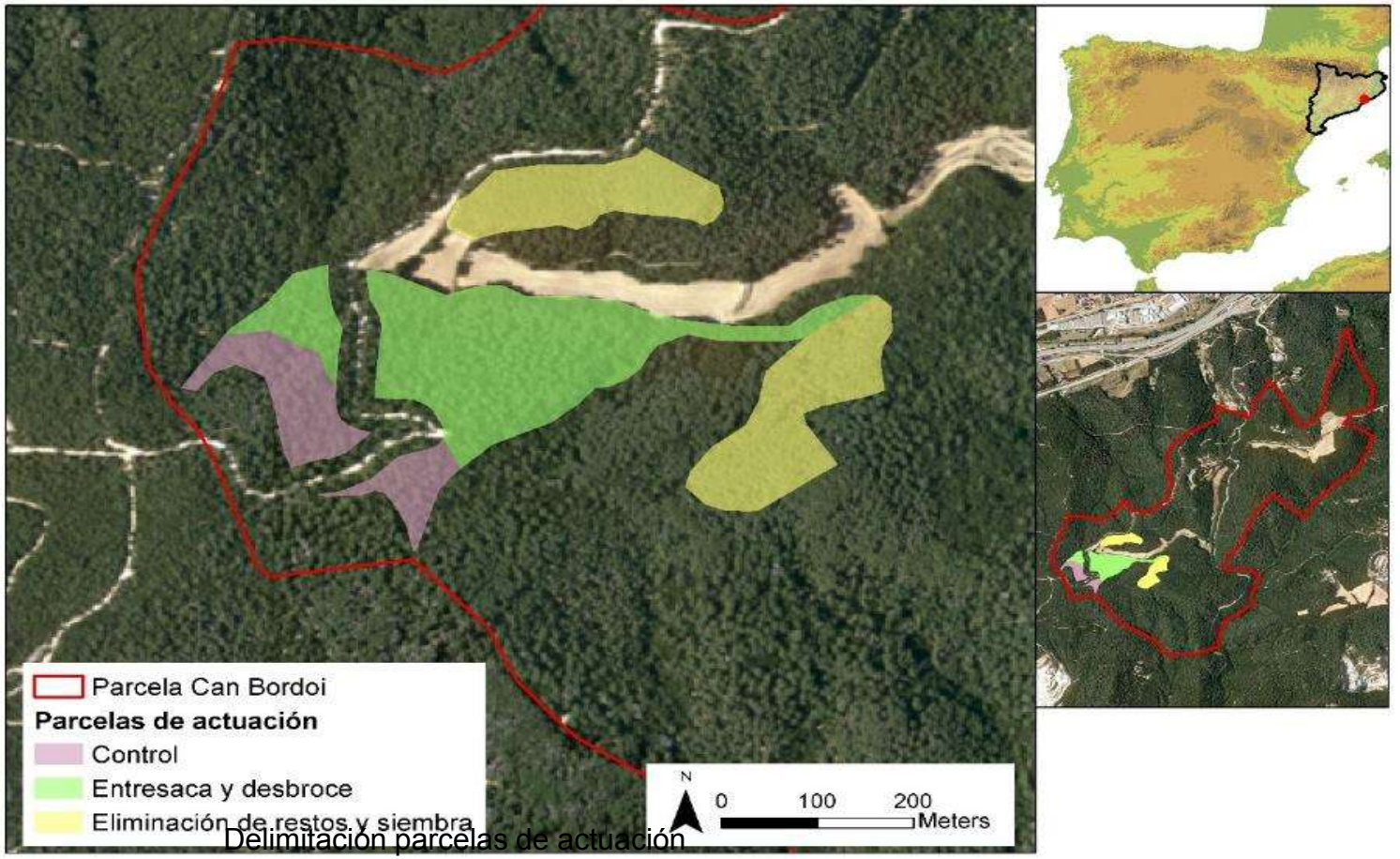


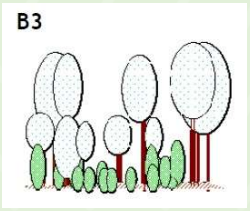
Delimitación parcelas de actuación

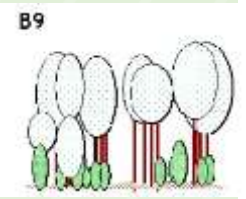
Fuel changes at stand level

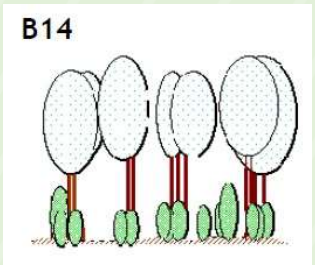
Initial situation

Post-acting situation

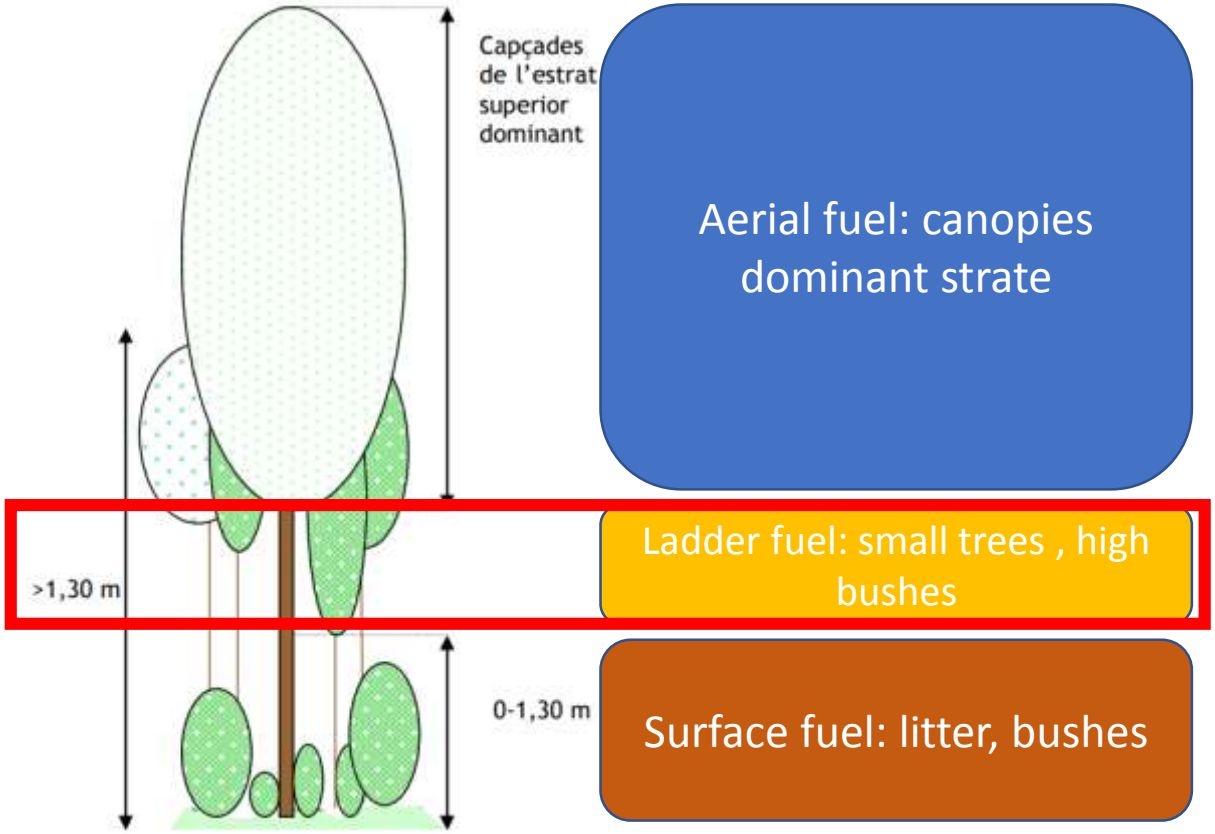
Structure models







Fuel changes at stand level

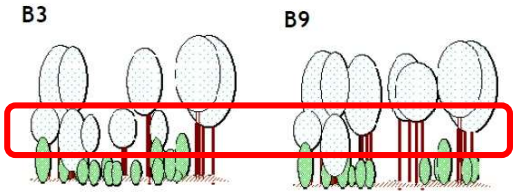


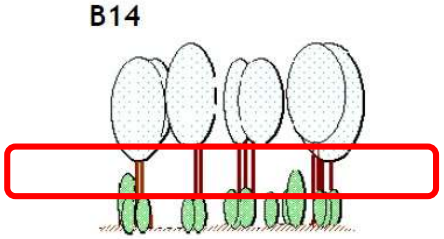
Aerial fuel: canopies dominant strate

Ladder fuel: small trees , high bushes

Surface fuel: litter, bushes

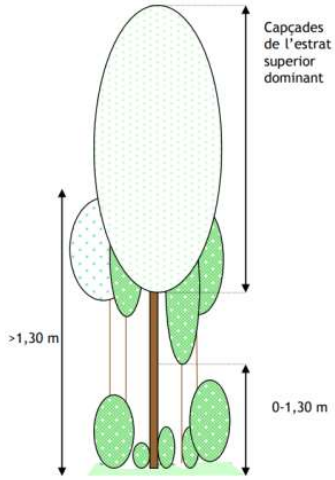
To avoid crown fires

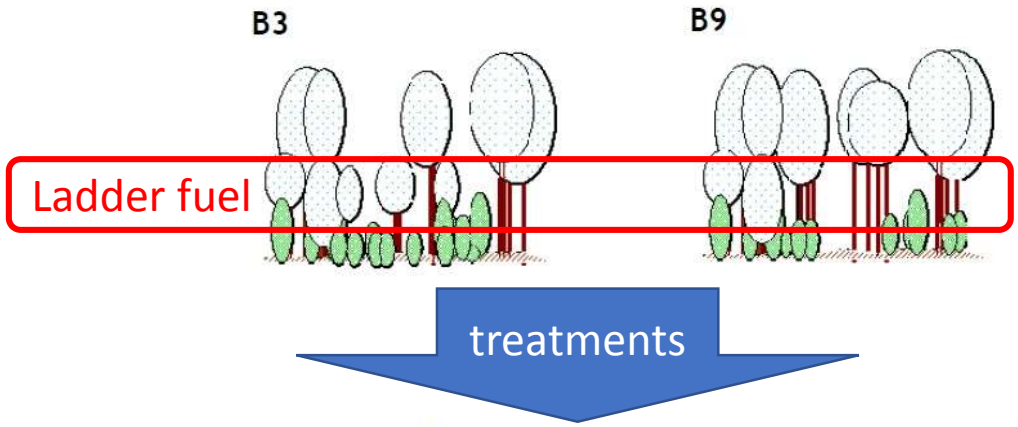


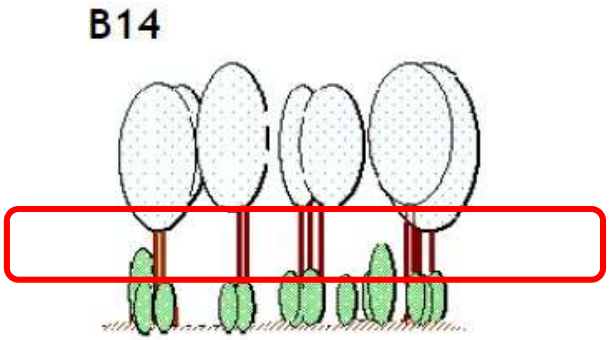


Piqué, M., Castellnou, M., Valor, T., Pagés, J., Larrañaga, A., Miralles, M., & Cervera, T. (2011). Integració del risc de grans incendis forestals (GIF) en la gestió forestal: Incendis tipus i vulnerabilitat de les estructures forestals al foc de capçades. *Série: Orientacions de gestió forestal sostenible per a Catalunya (ORGEST). Centre de la Propietat Forestal. Departament d'Agricultura, Ramaderia, Pesca, Alimentació i Medi Natural. Generalitat de Catalunya, Barcelona*, *122*.

Fuel changes at stand level



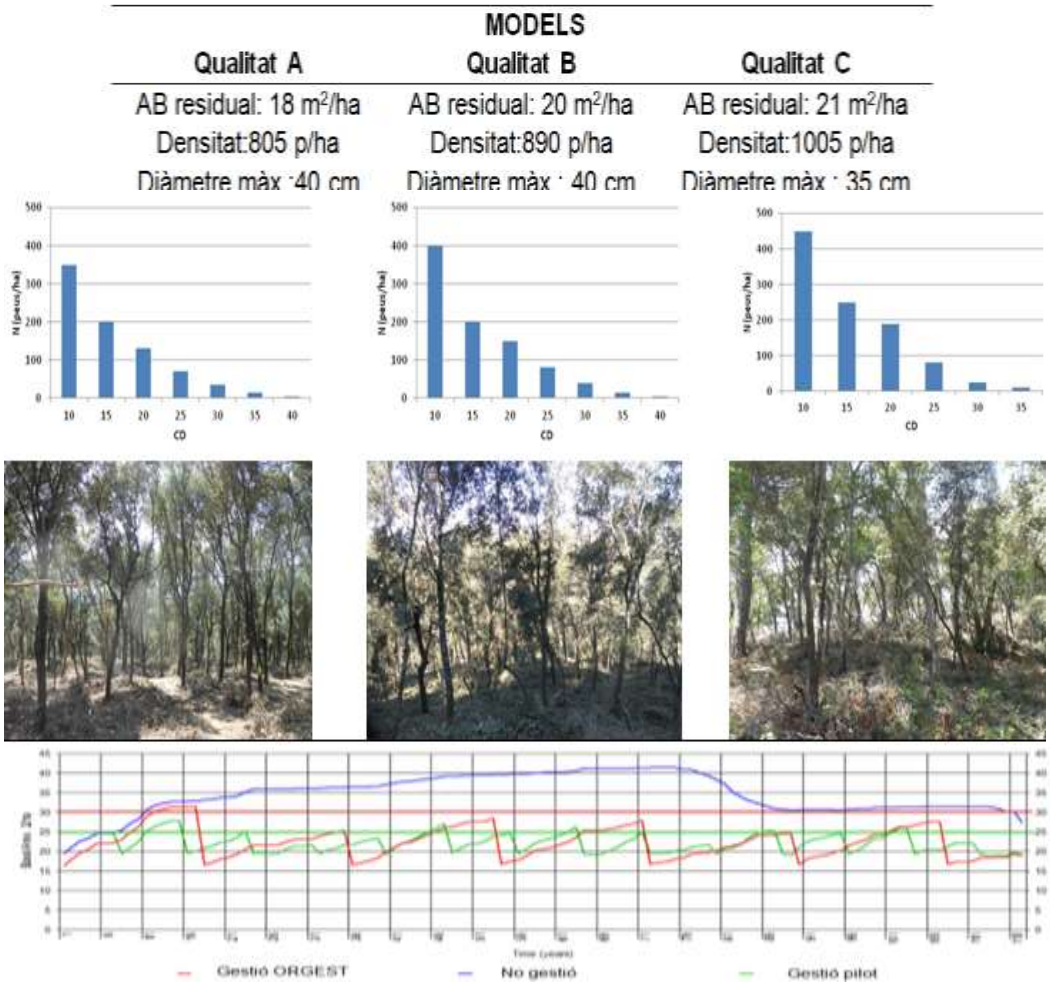




Ladder fuel:

- <20% Surface
- Compatible with uneveneged forests
- Continuous cover forestry helps to keep bushes underdeveloped

Modelling a new silvicultural itinerary under climate change conditions 2015



Qualitative criteria
(what to be promoted)

- Non dominated trees with a good response
- Well established trees
- Homogeneous on the stand
- Promote seed origin trees
- Secondary species
- Death trees, cavities

Quantitative criteria

- Maintain dense cover
- Rotation:>8 years
- Extraction >30m3/ha 20-25% BA
- When to treat:
  - >25 m2/ha BA
  - <30 m2/ha BA

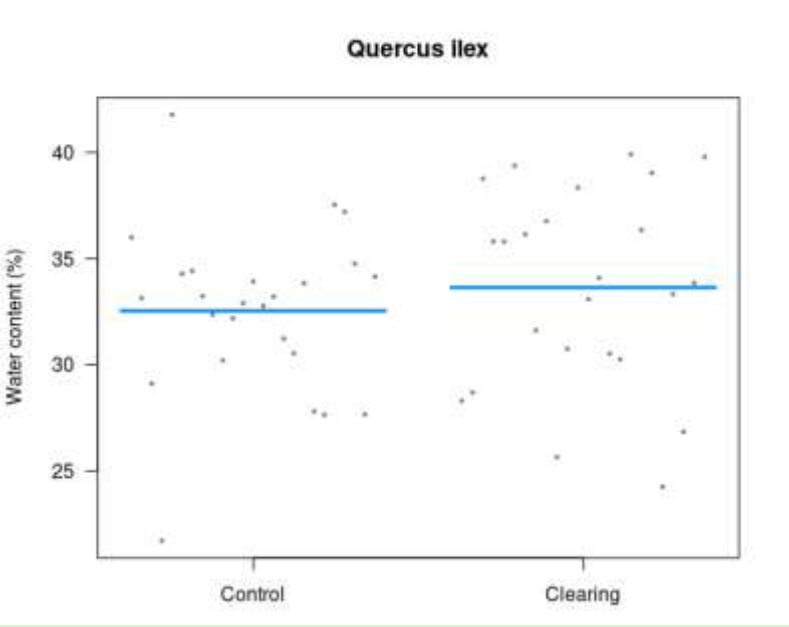
Landscape level

Recuperación mosaico agro-silvo-pastoral

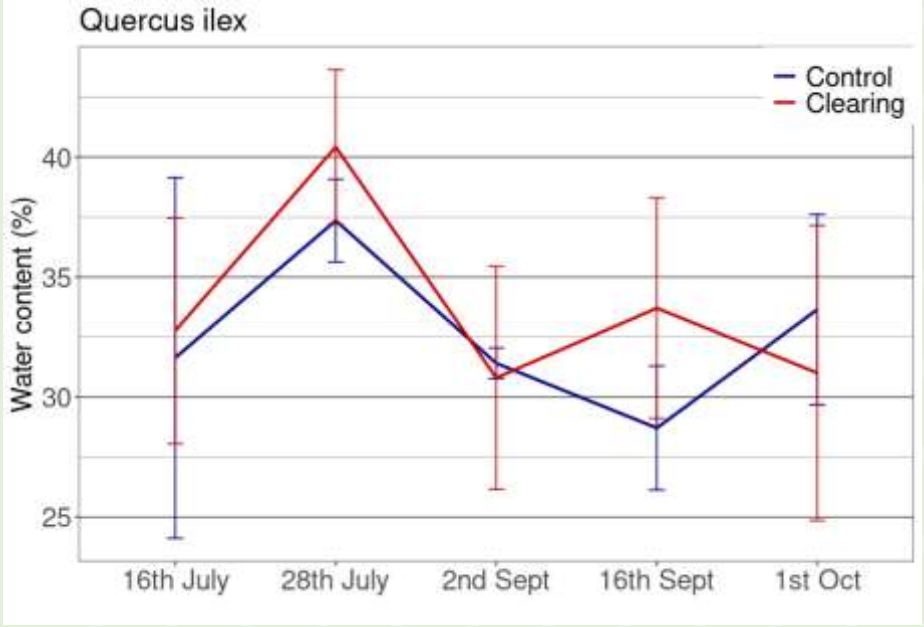
Initial situation

Post-acting situation

Fuel humidity



Soil Humidity



Example demonstration site: Can Casas

- Typology and opportunities:
  - Good quality site
  - High quality products opportunities
  - Well conserved (Capitalized site)

- Objectives:
  - + Resilience
  - Improve revenues (new commercial opportunities)
  - Optimization Silviculture treatments

LIFE MixForChange

New forest management techniques

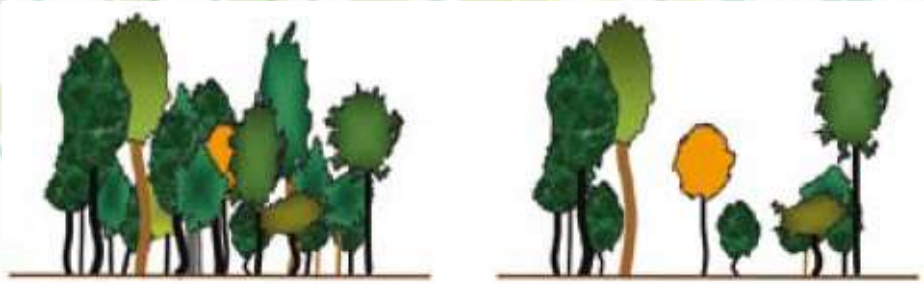
Proposed silviculture:

Irregular or semi-regular management from mixed mass ORGEST

- More complexity less density
- Regulates water stress
- Select the most vigorous and vital trees (more resistant to pathogens)

Management criteria close to nature. Selection of individual trees for:

- Quality wood production
- Seed (few species)
- Promotion of biodiversity



Sansone et al, 2012

LIFE MixForChange

New forest management techniques: Treatments

Tree stratum: selective thinning + resprouting selection + tree-oriented silviculture criteria

Bush stratum: partial and selective debushing

enrichment plantations

CTFC

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

Centre de la Propietat Forestal

serra de bellmunt
associació de propietaris forestals

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Forest typologies

Alzinars: 25 ha / 5 rodals
(Quercus ilex subsp. ilex)

Castanyedes: 21 ha/ 12 rodals
(Castanea sativa)

Rouredes: 11 ha / 4 rodals
(Q. pubescens, Q.petrea, Q.canariensis)

Pinedes: 20 ha/ 4 rodals
(P.pinea)

Avaluació tècnica

Before developing action

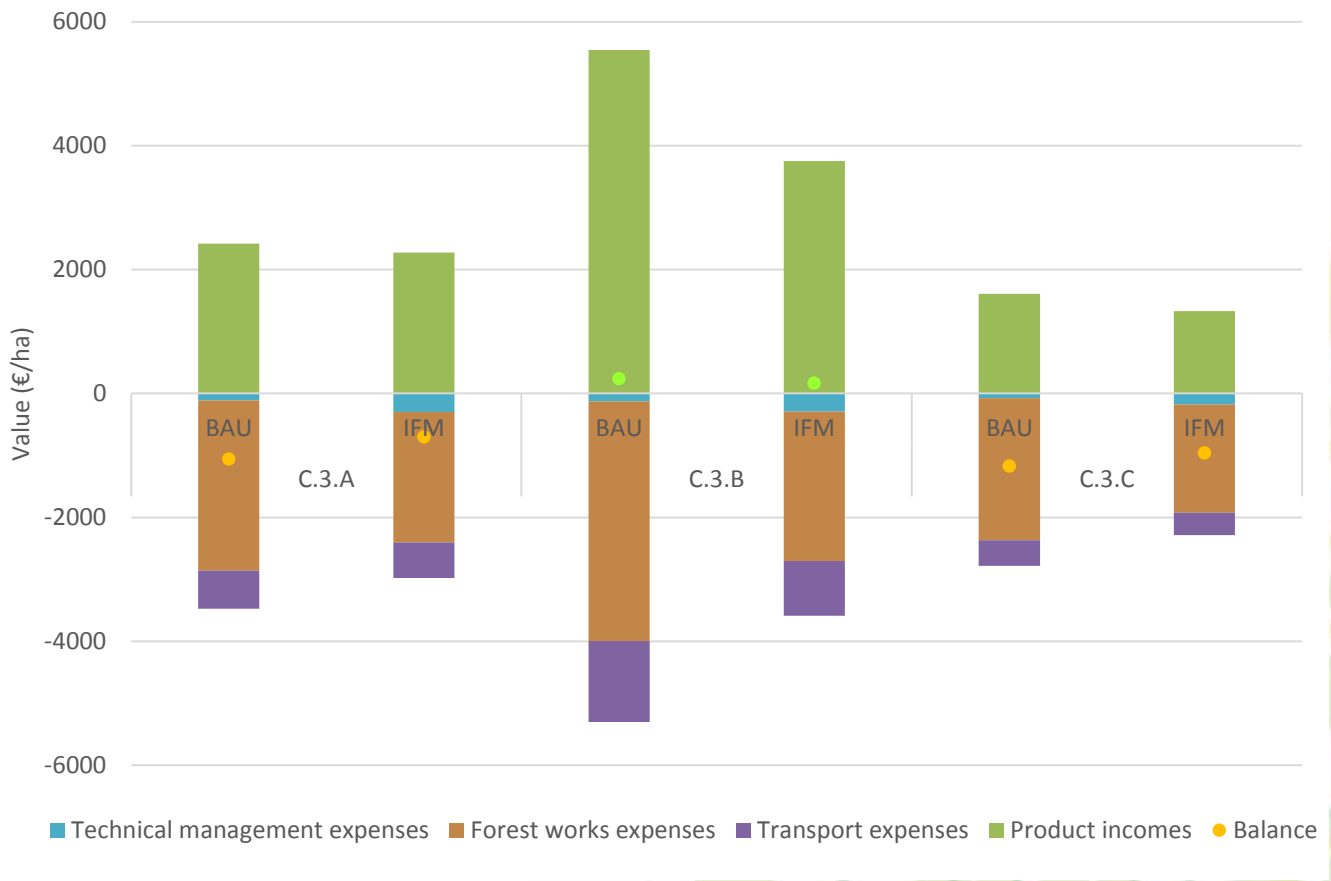
- Simplified structure centered on intermediate CDs (20 cm)
- Vertical and horizontal continuity
- Low vigor sprouts
- Low presence of sporadic planifolis

After developing action

- Reduction AB: 15-30%
- Vertical and horizontal discontinuity
- Higher proportion of sporadic deciduous trees
- Undergrowth:
  - surface<65%
  - <1.3 m high

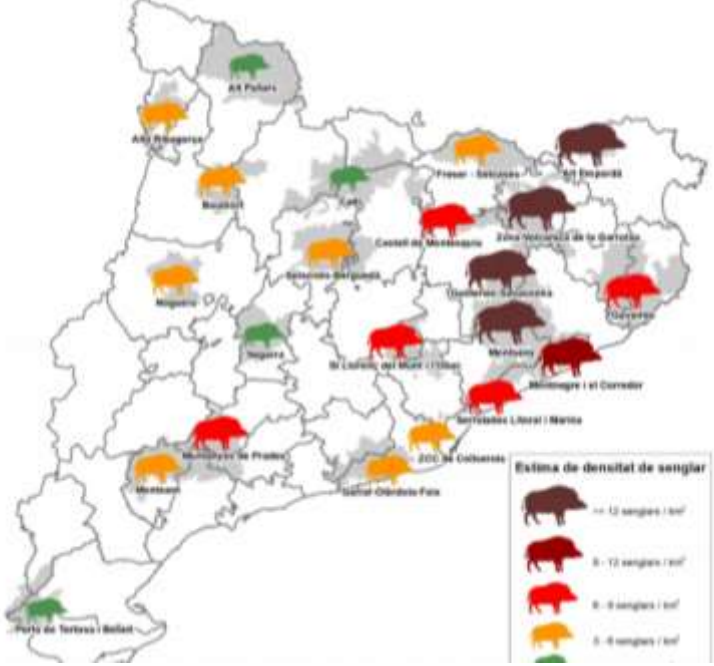
Economic evaluation

Oak




W170E


bois rond
quettes



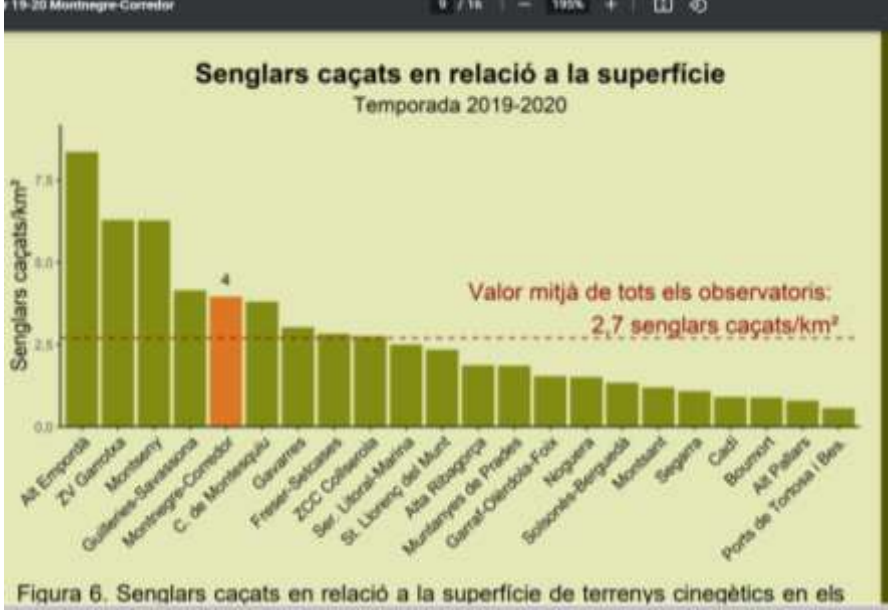
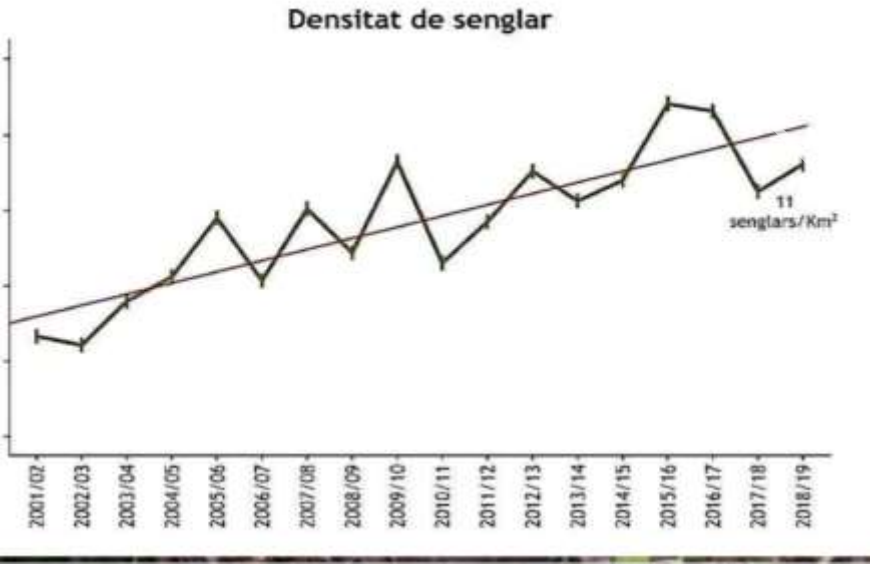


Figura 6. Senglars caçats en relació a la superfície de terrenys cinegètics en els

Hunting wildboar



Observatori	Acrònim	Nombre colles	Terrenys cinegètics	Superfície cinegètica (ha)	Total batudes	Senglars caçats
Alt Empordà	AEM	4	5 APC ZCC Fusimanya	13.016	229	809
Alt Pallars	PAR	7	RNC Alt Pallars	35.139	153	184
Alta Ribagorça	ARG	2	RNC Vall de Boí i ZCC Pont de Suert i ZCC Camporan	10.552	69	191
Boumort	BOU	7	3 APC RNC Boumort	16.607	100	178
Cadí	CAD	7	9 APC RNC Cadí	27.493	159	217
Castell de Montesquiu	MTQ	2	2 APC	10.792	75	363
Freser-Setcases	FRE	4	8 APC ZCC Monars RNC Freser–Setcases	23.272	219	485
Garraf-Olèrdola-Foix	GRF	9	13 APC ZCC Garraf	29.909	150	361
Gavarres	GAV	19	21 APC	59.226	853	1.743
Guilleries-Savassona	GUI	4	9 APC	16.880	201	774
Montnegre i el Corredor	MCO	14	15 APC	33.057	686	1.089
Montsant	MON	10	10 APC	29.559	187	360
Montseny	MSY	16	22 APC	41.760	612	2.068
Muntanyes de Prades	PRA	13	17 APC	33.894	278	793
Noguera	NOG	3	6 APC	22.464	54	401

Hunting Roe deer