# Marteloscope Dehesa de Valsalobre

## Field guide

GOBIERNO DE ESPAÑA
VICEPRESIDENCIA TERCERA DEL GOBIERNO
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO
Castilla-La Mancha
Integrate Network
facilitated by EFI

# Dehesa Boyal de Valsalobre forest

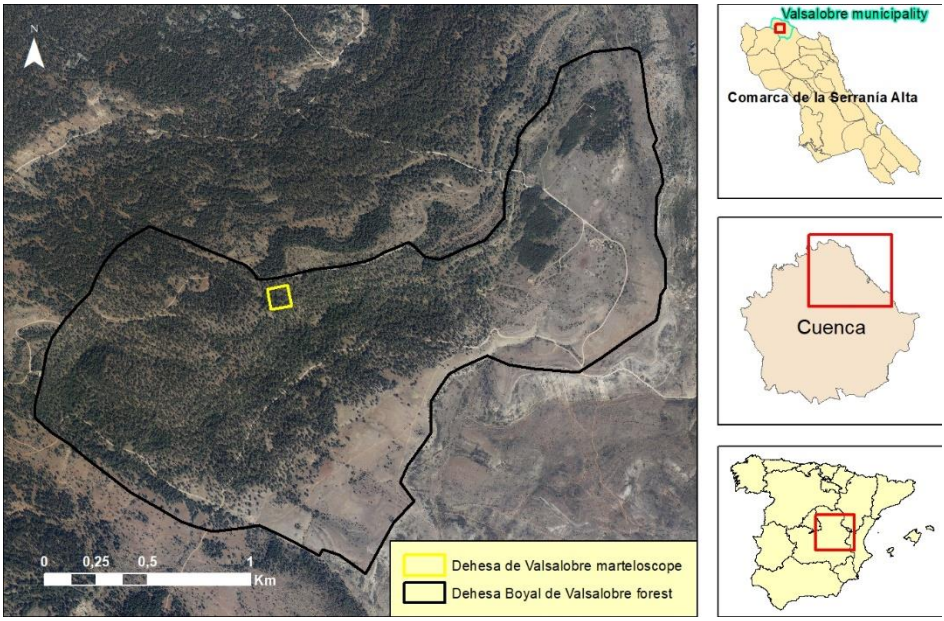
The forest of Dehesa Boyal de Valsalobre is located in the municipality of Valsalobre (Cuenca, Castilla-La Mancha). It is a public forest owned by Valsalobre's city council and managed by Delegación Provincial en Cuenca de la Consejería de Desarrollo Sostenible de Castilla-La Mancha.

It is in the north of Serranía de Cuenca, in the upper basin of the Tagus River, between 1300 and 1400 m of altitude. The forest has gentle slopes (<10%) and south and west exposures, with hardly any representation of the north orientation. Temperatures are very extreme due to the effect of continentality, with an annual thermal amplitude exceeding 20°C.

It is a forest of small dimensions with very different stand structures and management objectives. In less than 400 ha there are open woodlands (dehesa), pastures, natural and biodiverse pine forests and reforestations in different stages of development. The Portuguese oak dehesa and several herbaceous communities stand out as vegetation communities of special interest. The latter (seasonal amphibious oligotrophic communities, moorlands and hygroturbous silicolous reeds) is rather unusual in the region as they are linked to waterlogging areas.

Traditionally used for its pastures, wood harvesting of this dehesa was limited to firewood from dry pine feet and pruning of Portuguese oak. As a result of countryside abandonment and depopulation, this use has disappeared. Currently, the existing uses of the forest are logging, grazing cattle and hunting (wild boar, deer, fallow deer and roe deer).

*Location of the Dehesa de Valsalobre marteloscope.*



# ...in figures

**352 ha**
Total forest area

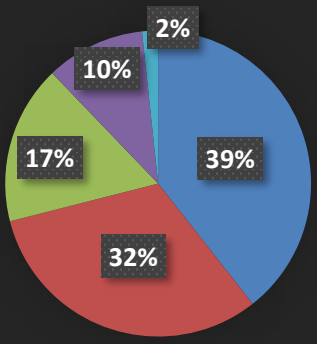
**0.8 m³/ha**
Annual increment

**66.5 m³/ha**
Actual average stock

**127 trees/ha**
Tree density

**141 m³**
Annual allowable cut of the pine stands

**100 steres**
Annual allowable cut of the Pyrenean oak stands (firewood)




- Shrubland and grassland
- Mixed stands of pine and portuguese oak
- Portuguese oak dehesa
- Pine stands (P. nigra y P. sylvestris)
- Others

**8.5 €/ha**
Annual income from wood

**45 % conifers**
**55 % broadleaves**

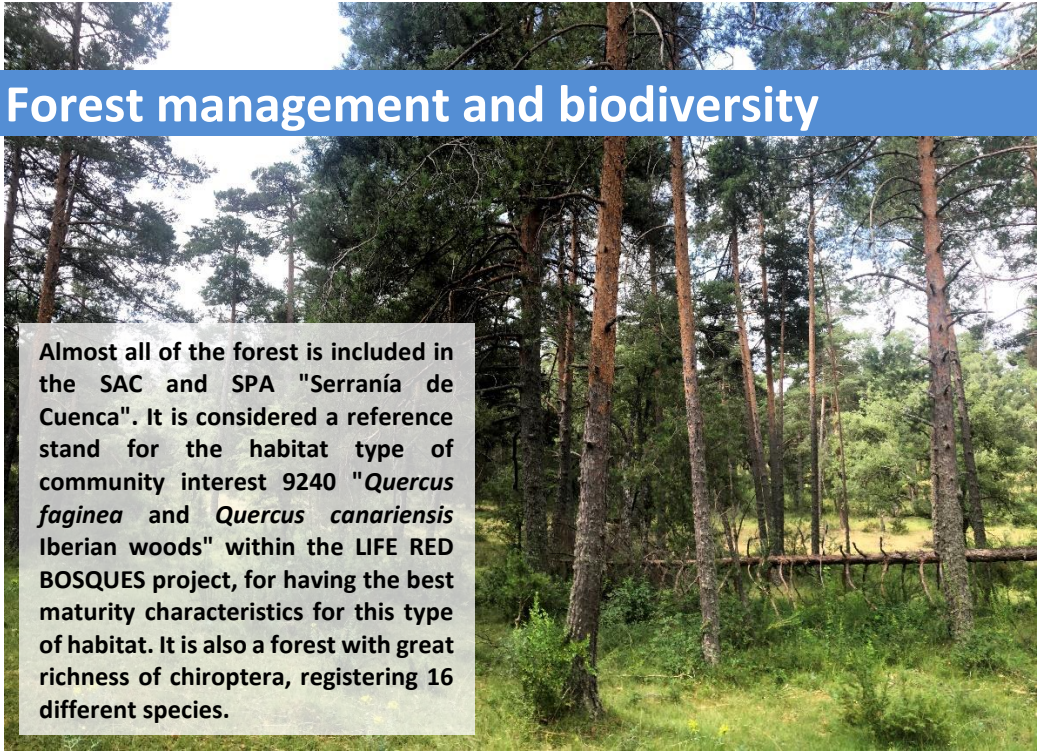
**38.5 m/ha**
Roads and trails density

**0.4 UGM/ha**
Range count

**1.6 €/ha**
Annual income for the rent of pasture use

**5.2 €/ha**
Annual income for the rent of game permission

# Forest management and biodiversity



**Almost all of the forest is included in the SAC and SPA "Serranía de Cuenca". It is considered a reference stand for the habitat type of community interest 9240 "*Quercus faginea* and *Quercus canariensis* Iberian woods" within the LIFE RED BOSQUES project, for having the best maturity characteristics for this type of habitat. It is also a forest with great richness of chiroptera, registering 16 different species.**

Herbivory in the Portuguese oak dehesa (habitat of special interest) is compromising the viability of the natural regeneration for this species. Several actions are being implemented to revert this situation. These are the maintenance of thorny scrub, which can act as a refuge for seedlings; the protection of stump shoots; and the limitation of grazing in areas where the need for regeneration is a priority because tree cover is low or because dry or decrepit trees are abundant.

These trees are retained, both standing and lying, to restore the saproxylic complex, to maintain habitats of threatened species of long life cycle large xylophagous insects (*Lucanus cervus*, *Cerambix cerdo*), and to increase the shelter and breeding niches of passerines and forest Chiroptera.

The forest is home to 52% Chiroptera species with Iberian representation. This high diversity in such a small area makes bat conservation a priority of forest management, primarily for those of forest habits. Some specific measures would be: avoiding cuttings during the breeding period of these species (May – September); maintaining enough tree cover to protect the soil and to keep the forest microclimatic conditions; and enhancing the structural heterogeneity of the vegetation.

**97.4 %**

**of the forest belongs to protected areas**

**24 bird species**

**4 saproxylic insect species**

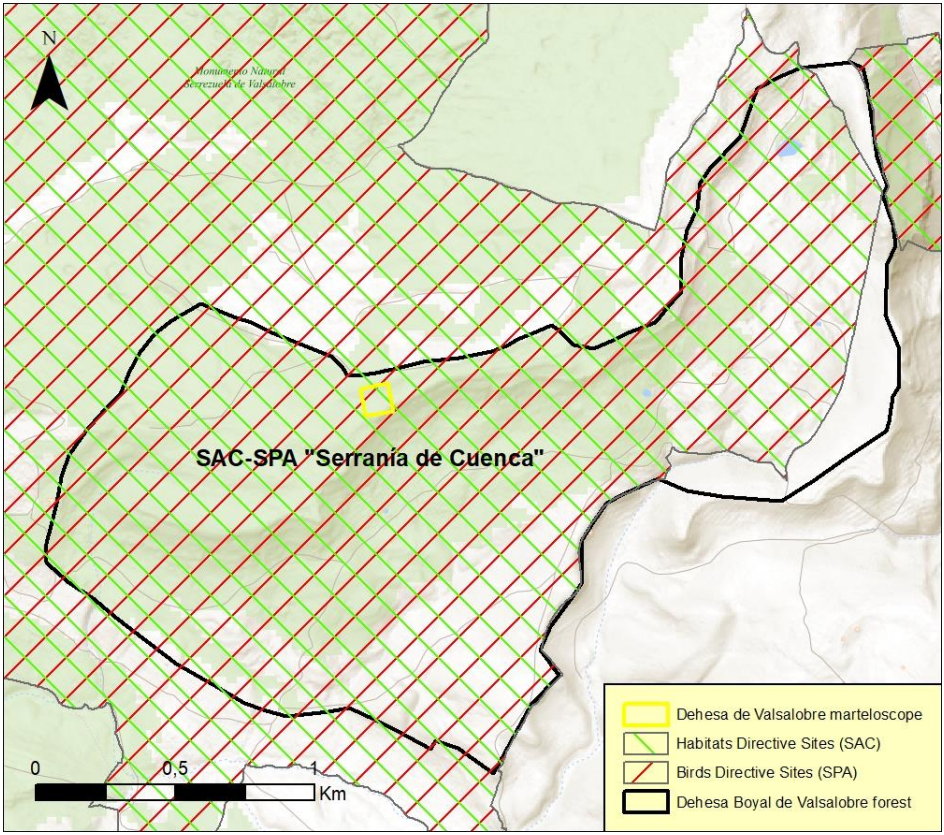
**16 bat species**

**2-3 trees/ha**

**The target for standing deadwood**

**206 ha of HCI 9240 "*Quercus faginea* and *Quercus canariensis* Iberian woods" intertwined with pines**

*Protected areas in Dehesa Boyal de Valsalobre forest.*



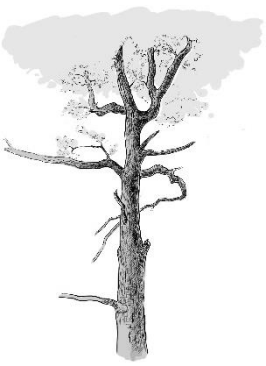
# Habitat structures

*Large quantities of deadwood and a high density of old microhabitat-bearing trees are characteristic elements of natural forests, especially of the old-growth phases. These phases are often absent or rare in managed forests, even in forests under close-to-nature management. Also in selective harvests and thinnings, 'defective' trees referring to these old-growth phases (hollow, dead and languishing trees) are often removed. Yet, an important share of forest biodiversity is strictly or primarily dependent on these elements for their survival, especially 'saproxylic' species, those are species depending on deadwood.*

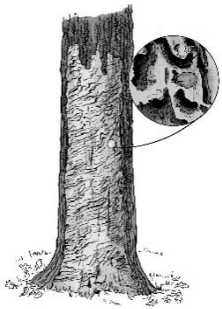
*Most species dependent on old-growth elements and phases have become threatened. Conservation of biodiversity in commercial forest stands is mainly a question of conservation of adequate amounts of deadwood and retention of such microhabitat structures.*

***Dead branches and limbs / crown deadwood*** *(DE11 & DE12)*

*DE11: Longer than 50 cm branches with diameter between 10 - 20 cm, sun exposed.*

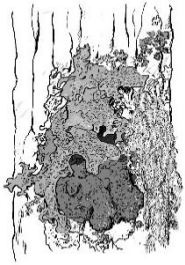


*DE12: Longer than 50 cm branches with diameter bigger than 20 cm, sun exposed.*



***Insect galleries and bore holes***

*CV51: Gallery with single small bore holes*



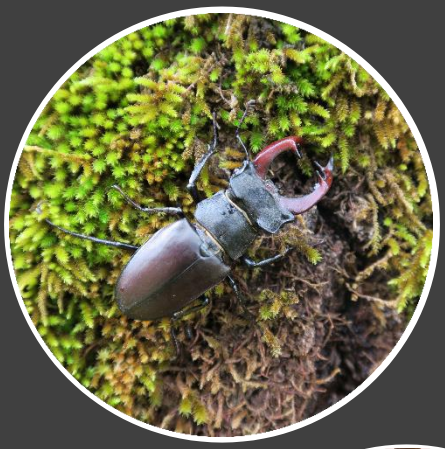
***Tree trunk covered by foliose and fruticose lichens (often in association with bryophytes)*** *(EP32)*

*Most common habitat structures in the marteloscope.*

# …and biodiversity

*Lysandra caelestissima*

*Pieris ergane*



*Lucanus cervus*

*Accipiter gentilis*

*Vipera latastei*

*Nyctalus lasiopterus*

Pictures by:

Pedro de la Torre Navarro (*Lucanus cervus*)

Nuria Cardo Maeso (*Pieris ergane* & *Lysandra caelestissima)*

Óscar de Paz (*Nyctalus lasiopterus*)

# Site conditions

| | |
|---|---|
| **Coordinates (X;Y):** | **573,403; 4,497,675 (ETRS 89 UTM Zone 30N).** |
| **Type of forest:** | **Montane mixed stand of *Pinus nigra*, *Pinus sylvestris* and *Quercus faginea.*** |
| **Soil:** | **Inceptisols (Xerochrept group).** |
| **Geology:** | **Yellowish-white sandstones, conglomerates and clays.** |
| **Altitude:** | **1347 m.a.s.l.** |
| **Mean annual temperature:** | **12 °C.** |
| **Annual precipitation:** | **785 mm.** |
| **Summer precipitation (1st June - 31st August):** | **125.9 mm.** |
| **Mean period of drought:** | **2 months (July and August).** |

The main species of this forest are the Portuguese oak (*Quercus faginea*); the black pine (*Pinus nigra subsp. salzmannii*), with a stand corresponding to the Austrian subspecies of this species (*Pinus nigra subsp. nigra*); and the scots pine (*Pinus sylvestris*). Other tree species that can be found in the forest are Spanish juniper (*Juniperus thurifera*), Montpellier maple (*Acer monspessulanum*) and field elm (*Ulmus minor*), all of them absent within the marteloscope.

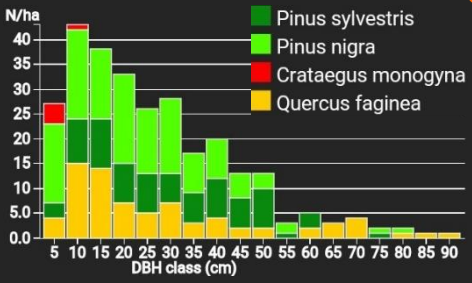
The understory has a medium density and consists of *Juniperus communis*, *Crataegus monogyna*, *Berberis vulgaris*, *Buxus sempervirens*, *Cistus laurifolius*, *Genista scorpius*, *Amelanchier ovalis*, *Rosa sp.* and *Rubus sp.*, *Prunus spinosa*, *Asphodelus albus*, *Thymus sp.*, etc. Regarding the grassland, it could be classified as sub-Mediterranean meadows on mainly basophilic soils, dominated by perennial species (*Brometalia erecti* Order) with little summer drought.

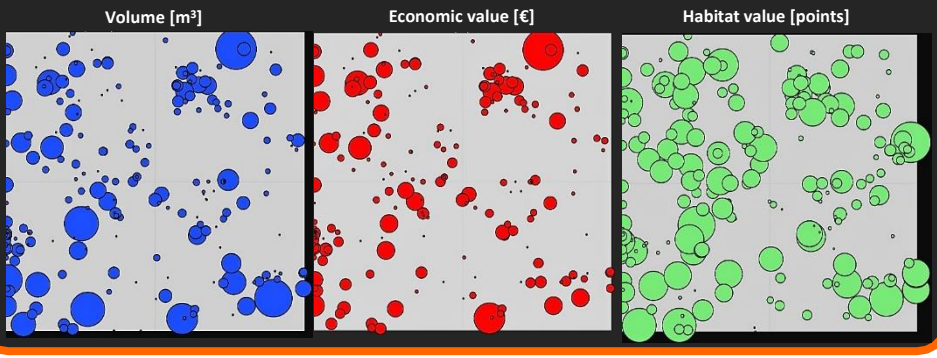
# Stand characteristics

The **Dehesa de Valsalobre** marteloscope is part of a semi-regular *P. nigra* adult stand with scattered groups of *P. sylvestris*, and old-growth *Q. faginea* pollards. This stand has evolved from dehesa structures of lower tree density thanks to the increase of the pine forest and the scrub stratum.

## Stand data

| | |
|---|---|
| N [stems/ha] | 279 |
| BA [m²/ha] | 24.2 |
| Volume [m³/ha] | 94.5 |
| Habitat value [points] | 5848 |
| Economic value [€] | 3926 |
| Standing deadwood [m³/ha] | 1.3 |
| Lying deadwood [m³/ha] | 5.3 |




The **economic value** (in €) is estimated for each tree based on volume, stem quality and corresponding local timber price lists.
The **habitat value** (in points) is assessed for each tree based on tree microhabitats, taking into account the rarity of each habitat and duration for it to develop.

The evaluation of the habitat value is based on a comprehensive catalogue of tree microhabitats. It comprises 23 saproxylic and epixylic f eatures such as cavities, large dead branches, cracks and loose bark, epiphytes, sap runs, or trunk rot characteristics. Tree microhabitats are of prime importance for specialized and often endangered forest species of flora and fauna.

# Ecological value assessment

Each tree-related microhabitat represents a habitat structure. There are three variables related to each of them, given values from 1 (minimum significance for that given variable) to 5 (maximum relevance).

These three variables are:

**Score:** Importance of habitat structure as a refuge for biodiversity.

**Rarity:** Infrequency or scarcity.

**Development:** Time needed for its growth.

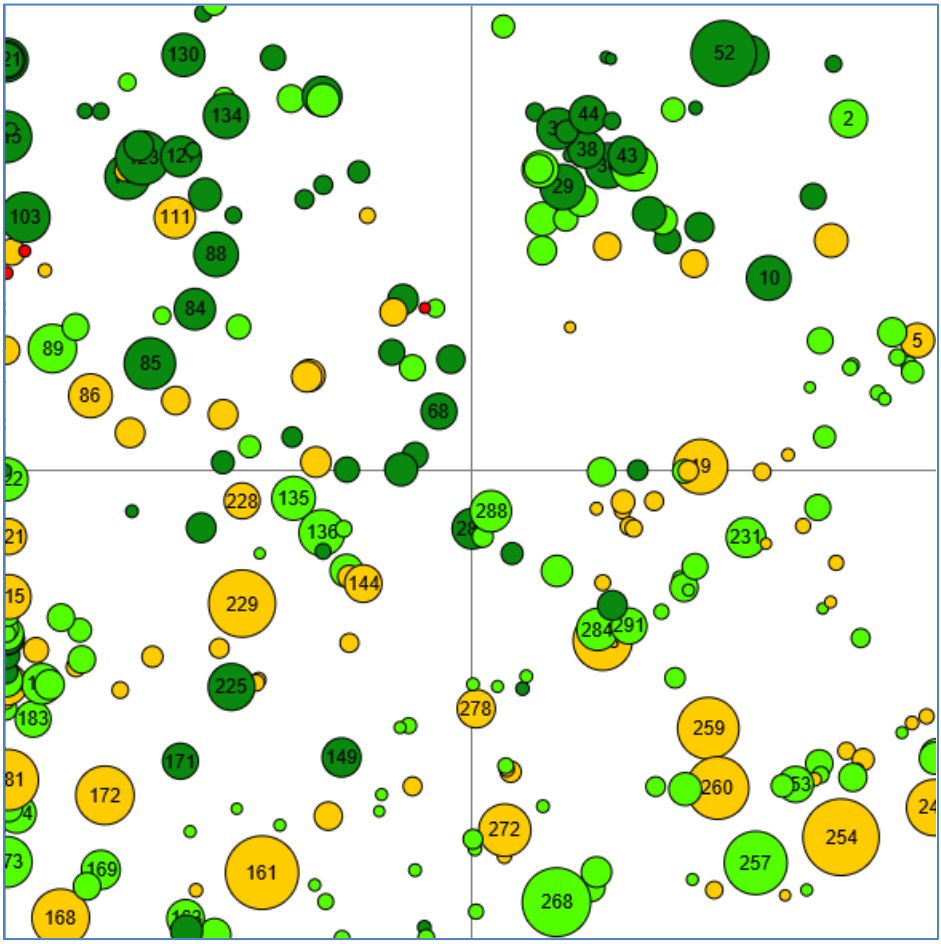
*Pollard portuguese oak covered by moss (EP31).*

The ecological value of each habitat structure is therefore calculated by **adding the rarity and development values, and multiplying that sum by the score value**. The ecological value of a tree will therefore be the addition of the values of each of its habitat structures.
Finally, the total ecological value of the marteloscope, would be either the addition of the values of all the trees, or the addition of the value of all the structures (there can be several per tree).

*Table used for the calculation of the ecological value. Due to space limitations, only the 10 highest values are displayed. For more details about microhabitats see Kraus et al. (2016).*

| | Habitat structure code | Score | Rarity | Development | **Habitat structure value** | Nº of trees with this structure | **Ecological value** |
|---|---|---|---|---|---|---|---|
| Saproxylic microhabitats | **CV11** | **2** | **4** | **2** | **12** | 13 | 156 |
| | **CV15** | **5** | **5** | **5** | **50** | 1 | 50 |
| | **CV51** | **1** | **3** | **1** | **4** | 93 | 372 |
| | **IN21** | **2** | **4** | **3** | **14** | 19 | 266 |
| | **DE11** | **1** | **3** | **4** | **7** | 186 | 1302 |
| | **DE12** | **2** | **3** | **4** | **14** | 96 | 1344 |
| Epixylic microhabitats | **GR31** | **2** | **4** | **2** | **12** | 6 | 72 |
| | **EP32** | **2** | **4** | **2** | **12** | 82 | 984 |
| | **EP34** | **2** | **3** | **3** | **12** | 21 | 252 |
| | **OT11** | **4** | **5** | **3** | **32** | 28 | 896 |

# Marteloscope tree map




*The size of these circles is a relative representation of the diameters of the different trees. In no case is it their actual diameter.*

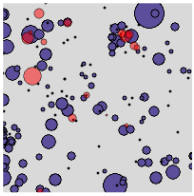
- *Pinus sylvestris*
- *Pinus nigra*
- *Crataegus monogyna*
- *Quercus faginea*

# Example of interventions

A comparison of two interventions is shown as a result of the first *in situ* virtual tree selection exercise in the **Dehesa de Valsalobre** marteloscope, taking place on the 28th April 2022. Following the guidelines of this forest management plan, in both cases pines with diameters higher than 45 cm are selected, until reaching removed volumes between 1/7 and 1/5 of the stock, keeping basal area values of at least 20 m²/ha, taking into consideration the regeneration needs of *Pinus nigra*. Furthermore, minimising the habitat value extraction is also intended.

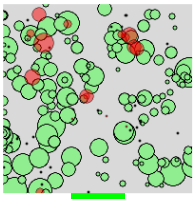
## Example 1

Economic value [€]



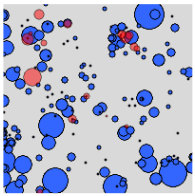
442 € obtained

Ecological value [points]



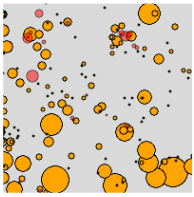
5414 remains

Volume [m³]



Removal 9 m³

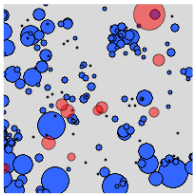
Basal area [m²]



22.1 m² remains

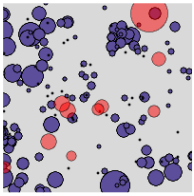
## Example 2

Volume [m³]



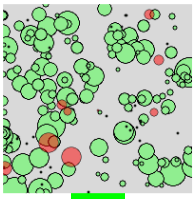
Removal 8,6 m³

Economic value [€]



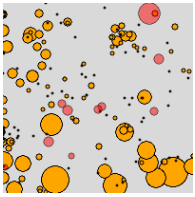
431 € obtained

Ecological value [points]



5573 remains

Basal area [m²]



22.1 m² remains

# References

Photographs: Pedro de la Torre Navarro (*Lucanus cervus*); Nuria Cardo Maeso (*Pieris ergane* & *Lysandra caelestissima*); Óscar de Paz (*Nyctalus lasiopterus*).

The different graphs, tables, screenshots, and other exercise results were created using the 'I+' software:

1) iplus.efi.int

2) Schuck, A., Kraus, D., Krumm, F., Held, A., Schmitt, H., 2015. Integrate+ marteloscopes – Calibrating silvicultural decision making. Integrate+ Technical Paper No. 1. 12 p.

Garcia, E., (2015): Observatorio de precios de productos forestales, RedFor, Confederación de organizaciones de selvicultores de España. https://selvicultor.net/redfor/wp-content/uploads/Observatorio-de-precios-Completo_Sep-2015_Final.pdf

Kraus, D., Bütler, R., Krumm, F., Lachat, T., Larrieu, L., Mergner, U., Paillet, Y., Rydkvist, T., Schuck, A., and Winter, S., 2016. Catalogue of tree microhabitats – Reference field list. Integrate+ Technical Paper. 16p.

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Zurita, M., 2014. Proyecto de ordenación del monte de U.P. nº 210 "Dehesa Boyal". Término municipal de Valsalobre. Cuenca.

The Integrate Network is an alliance of representatives of different European countries that promotes the integration of nature conservation into sustainable forest management at the policy, practice and research level. Forest management challenges related to nature conservation are rather similar across Europe. The Integrate Network promotes the exchange of successful management practices and experiences amongst its Members. The European Forest Institute (EFI) accompanies the process in its role as facilitator and scientific advisor.

Rojo Serrano, L., Moreno Segovia, M.J., Merino Verdugo, T., Ramírez-López, M., García-Lanchares, C., Martínez Ruiz, A., Dregorio Aguilar, A., 2022. The Dehesa de Valsalobre marteloscope field guide. Integrate Network Technical Paper. 14 p.

MITECO, 2022

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