LIFE
Scrubsnet

Revitalizing semi-arid extensive farming habitats through the sustainable management of their associated scrubs areas

INFORMATION SHEETS PILOT FARMS

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Consejería Transición Ecológica y Sostenibilidad

JUNTA DE EXTREMADURA
Consejería para la Transición Ecológica y Sostenibilidad

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INTRODUCTION

The LIFE Scrubsnet project aims to promote nature conservation and to reduce biodiversity loss in one of the largest agrosilvopastoral systems in Mediterranean Europe, the dehesas/montados, which cover around 3 million hectares in Spain and Portugal and to a lesser extent in Italy and France. These systems are represented in the Habitats Directive by habitat 6310: *Dehesas with evergreen Quercus spp*, a characteristic landscape of the south-western quadrant of the Iberian Peninsula in which crops, grassland or mesomediterranean shrubland, in juxtaposition or rotation, are shaded by a highly variable canopy cover of evergreen *Quercus* (*Quercus suber, Quercus ilex, Quercus rotundifolia, Quercus coccifera*).

According to the information collected in the Standard Data Form for RN2000 sites, the habitat with code 6310 is present in Portugal, Spain, France and Italy. In total, it is found in 346 RN2000 sites, occupying an area of 1,057,676 ha, 98% of which are located in Spain.

By country, this habitat has been recorded in 285 RN2000 sites in Spain with a total area of 1,035,977 ha, in 35 sites in Portugal with 754 ha, 4 sites in France with 3,147 ha and in 22 sites in Italy with 18,551 ha.

The species that occupy dehesas depend, directly or indirectly, on the presence, abundance and distribution of the dominant trees, which condition the structure and functioning of their material and energy cycles. Given that the main conservation problem of this type of habitat is the absence of regeneration of the dominant trees, the presence and distribution of nurse shrubs that protect seedlings from the action of drought, livestock and wild ungulates, as well as helping to maintain local populations of seed dispersers, are a key element in their sustainability.

LIFE ScrubsNet focuses on the regeneration and improvement of dehesas and their associated wild species through the appropriate management of scrubland areas as a fundamental element for the conservation of the whole ecosystem. This project proposes an experimental development of a mosaic scrubland management model to promote the environmental and economic sustainability of the habitat, offering landowners a differentiated management alternative where natural capital is at the core of the system. The ultimate aim is to reconcile agricultural and conservation policies for these habitats so that obtaining economic profitability is compatible with their long-term persistence.

CONSERVATION ACTIONS

- C1 Protection of existing key shrub areas on pilot farms
- C2 Regeneration of *Quercus*, scrubs and soil
- C3 Creation of new scrub areas in degraded areas and enhancement of existing scrubs areas with species that provide environmental health and socio-economic value
- C4 Measures for direct enhancement of threatened associated species in shrubland areas

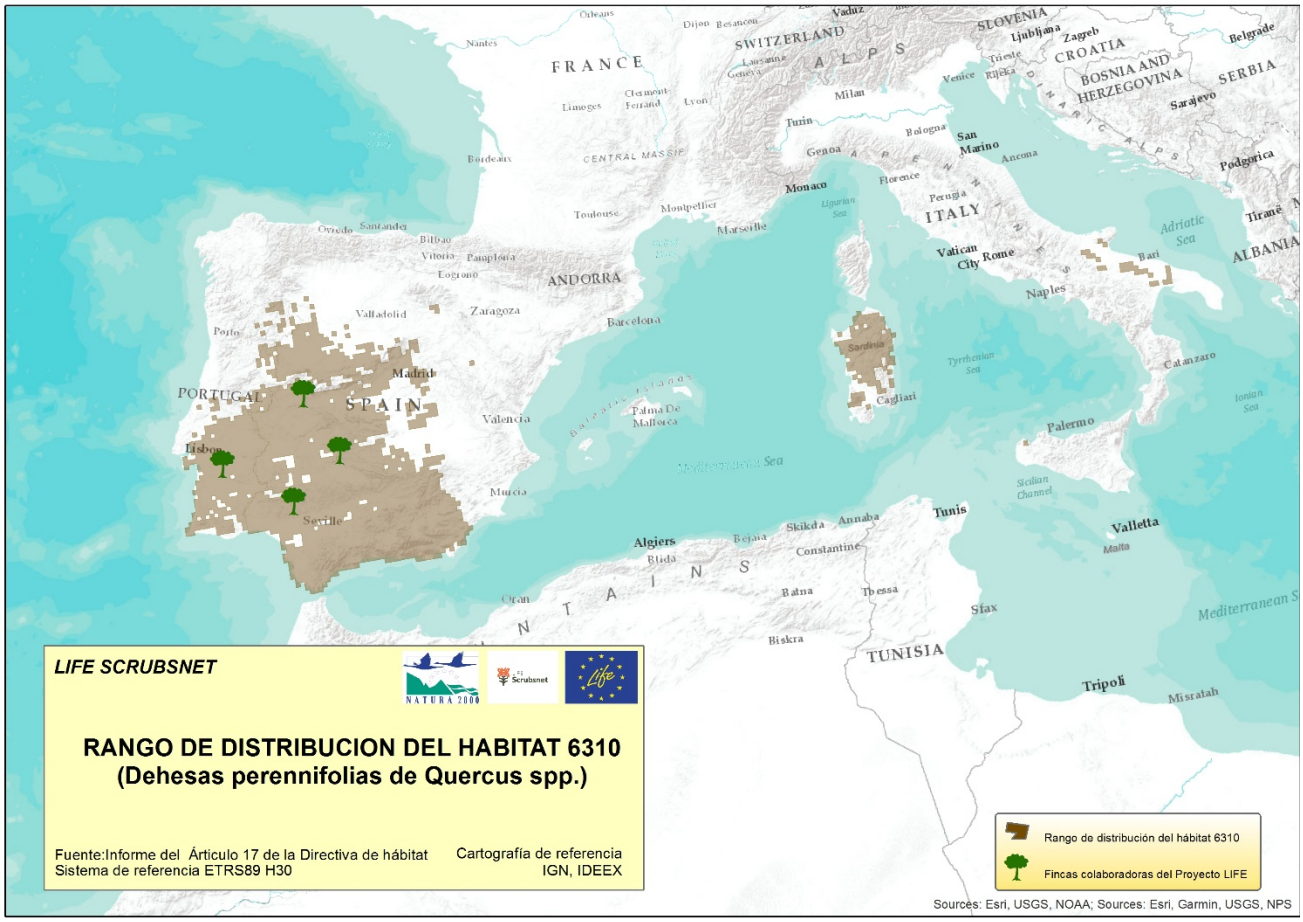
MONITORING ACTIONS

- Bird indicator species
- Invertebrate indicator species (mainly pollinators)
- Mammalian indicator species
- Reptile and amphibian indicator species
- Soil health and diseases

OBJETIVES

- Protect, regenerate and create key areas of scrubland in representative dehesas to ensure regeneration of the system, improvement of biodiversity and productivity under an integrated management model.
- Implement specific conservation measures for endangered species associated with dehesa/mountain scrubland areas included in the Birds Directive and the Habitats Directive.
- Improve the regeneration of trees in the dehesas, as one of the main problems is their ageing.
- Improving soil health and promoting a natural barrier against pests and diseases through the management of scrub areas.
- Demonstrate the positive impact of project actions on biodiversity, soil and socio-economic factors.
- Refinement of policies and programmes towards sustainable conservation of habitat 6310 and as elements of connectivity between RN2000 sites.
- Replicability/Effective transferability of project results.

LOCATION MAP



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INFORMATION SHEET

TERRA DAS FREIRAS E GRUPO SÃO MATEUS

Responsible Partner

Consejería Transición Ecológica y Sostenibilidad

JUNTA DE EXTREMADURA

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HERDADES TERRA DAS FREIRAS E GRUPO SÃO MATEUS

INFORMATION ABOUT THEFARM	
Name of the farm	Terra das Freiras e Grupo São Mateus
Location	Montemor-o-Novo (Portugal)
Surface	Terra das Freiras: 205 ha. Grupo São Mateus: 297 ha.
Management	Private



DESCRIPTION OF THE PROPERTY

The Terra das Freiras (205 ha) and Grupo São Mateus (297 ha) farms belong to the same private owner, although their uses are different. They consist of pastures of holm oak and cork oak with a medium-high density and some areas of bushes. Both farms are divided into several plots.

In Terra das Freiras there are seven plots: six with dehesa and one with a very old olive grove. The olive grove is no longer used for olive oil production and is available for extensive grazing. The livestock consists of approximately 80 head of Angous and Limousine crossbred cattle. Periodically (every 9 years) cork is extracted from the cork oaks and the last extraction was in 2021.

In São Mateus there are eight plots of pasture land and a central plot mainly dedicated to fodder production, with very few holm oaks. The livestock consists of 420 head of Merino sheep and 110 head of cattle, of the Mertolengas and Limousine breeds. The cattle rotate on these plots in order to make better use of the pasture. Cork is also harvested in São Mateus (2021) and in some areas there is fodder production.

On both farms, supplementary feed (hay) should be added to the animals in late summer, especially in years with severe drought.



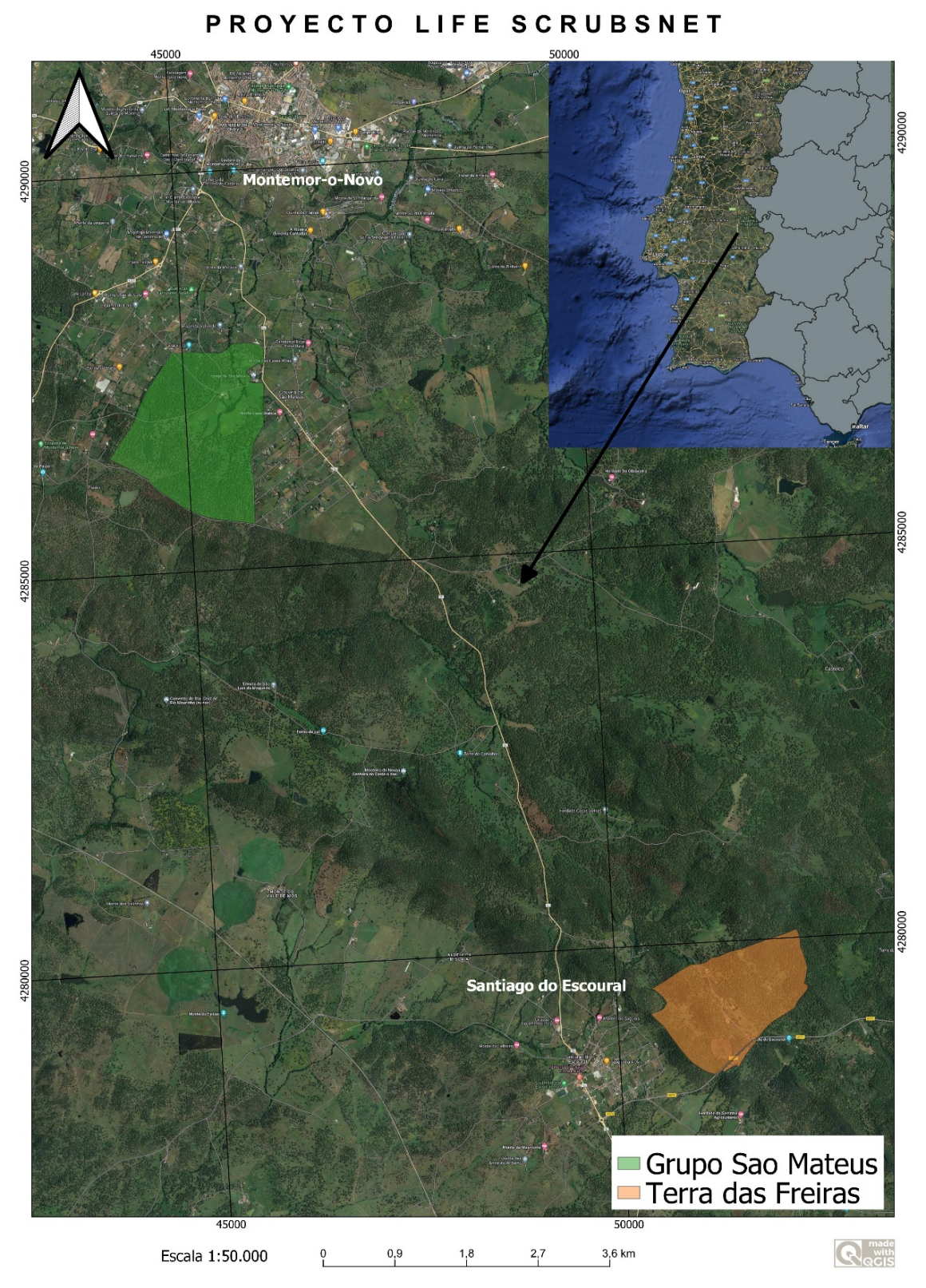
1. 1. Images of the farms; left Terra das Freiras, right Sao São Mateus Group.

In both farms, the shrub is generally controlled with brushcutters approximately every 8 years, although in many cases the role of cattle is sufficient to control the shrubs. Terra das Freiras is better preserved, with more shrub presence (*Cistus salvifolius, Rubus ulmifolius* and *Calicotome villosa*) and crags where there is regeneration, but both generally have little regeneration, especially of shrubs.

As livestock farms, the availability of water is essential and there are several infrastructures for this purpose: in Terra das Freiras there is an artificial pond that does not usually dry up in summer, a well and several smaller springs. There are also a couple of streams with summer droughts. On the other hand, at São Mateus there are four artificial ponds (although far from the action areas), two wells and a stream with summer drought. Both properties have orography and gentle slopes (5-15%), ranging from 250 to 400 metres. Regarding the soil, Terra das Freiras has poorly developed soils poor in organic matter, cambisols and luvisols. Very similar is São Mateus, which has poor soil, classified as luvisol, red or yellow Mediterranean soils, non-calcareous, with a lot of clay at depth.



2. Cork oak grove with shrub islands in Terra das Freiras



3. Property location plan

BIODIVERSITY

HABITAT

Both properties are composed of medium-high density holm and cork oak montados and some areas of shrubs. They have been declared as FIZ (Forest Intervention Zone), benefiting from a forest management plan. Furthermore, the whole area belongs to the "Monfurado" SCI, with a total of 239 km2 (23921.71 ha). In this SCI we can find Mediterranean habitats such as 6310 (montados of evergreen *Quercus spp.*) or 9340 (forests of *Quercus ilex* and *Quercus rotundifolia*). In these areas we can find many species of interest, belonging to different faunal groups, namely

Birds: We can find typical forest species, such as diurnal birds of prey, such as the buzzard or hawk, or nocturnal birds of prey, such as the tawny owl. Given the large number of insects, the family of insectivorous birds is well represented, with species such as the great tit, the great tit and the blue tit. In the humid zones, species such as the white stork and the grey heron can be seen.

Mammals: Due to the abundant forest vegetation and the presence of abandoned mines in the region, there is a high abundance and diversity of bats, especially forest bats (for example, the lesser horseshoe bat, black bat and Bechstein's bat) and cave-dwelling species (for example, the lesser mouse-eared bat, and the greater horseshoe bat). Other mammals of interest are the badger, genet, mongoose and otter. It is an interesting area for the future presence of the Iberian lynx.

Fish: the most important species are the Iberian porcupine (*Squalius alburnoides*) and the Portuguese bogue (*Chondrostoma lusitanicum*).

Amphibians: The common toad, the black wedge toad, the salamander and the orange-bellied newt were identified as frequent amphibians in the SCI, although, as we are in a cork oak forest habitat with abundant cattle ponds, they become very important for amphibian reproduction, subsequent inventories should detect a greater number of species, including the yellow-spotted salamander or the Iberian midwife toad, good bio-indicators of the environmental state of the habitats.

Reptiles: The sardinian can be observed in rocky areas, and in wetter areas the Mediterranean terrapin or the viperine water snake, as well as species from drier areas such as the horseshoe snake or the blind snake, which uses sandy areas for its shelters.

In general terms, the state of biodiversity is considered good in both farms, although the São Mateus farm has greater problems with regard to tree and shrub regeneration, as well as soil erosion.

On both farms, the islands of scrub that exist are of interest as a refuge for the biodiversity of the study area.



4. Representative bioindicator fauna: common toad in Terra das Freiras.

GENERAL AND HEALTH STATUS OF SHRUBS AND TREES

ARBOREAL VEGETATION

The tree vegetation existing on both farms comprises two species, *Quercus suber* and *Quercus ilex*. Analysing each property, Terra das Freiras is formed by a cork oak forest with good density and some natural regeneration in some areas. In terms of surface area, there are 93 hectares of dense forest, 10 hectares of dense scrubland with forest and 90 hectares of meadows with dense forest. Finally, there are 6 hectares of olive groves and another 6 hectares of meadows. In general terms, except for some very old trees, the condition of the trees is good. There are no *P. cinnamomi* spots on the trees.

In the São Mateus group we find a Holm and Cork Oak montado with more intensive use and less regeneration, only in some islands of thorny scrub (pilriteiro). In terms of surface area, we have 264 hectares of meadows with dense forest and 33 hectares with forage and various pastures. The condition of the trees is more aged and there are no patches of *P. cinnamomi* on the trees.

SHRUB VEGETATION

There are islands of shrubs scattered around the farms, mainly brambles, shrubs of rocky areas and, in Terra das Freiras, a shrub with a very limited distribution, *Calicotome villosa*. There are also some very interesting rocky areas for the refuge of biodiversity and regeneration of shrubs and trees. By farms, the shrubs present are:

Shrubs present in Terra das Freiras
Calicotome villosa, Ononis sp., Pteridium aquilinum, Ulex spp., Pyrus bourgaeana, Cistus salviifolius, Cistus crispus, Ruscus aculeatus, Pteridium aquilinum, Rubus ulmifolius, Crataegus monogyna (Pilriteiro), Otiganum vulgare y Daphne gnidium.
Shrubs present in the Sao Mateus Group
Crataegus monogyna, Ruscus aculeatus, Rubus ulmifolius, Asparagus sp., Calicotome villosa, Quercus coccifera, Daphne gnidium, Ononis sp., Smilax aspera, Aristolochia sp., Rubia peregrina, Olea europea y Tamus communis.

As for the state and regeneration of the shrub layer, there are occasionally more degraded areas, although there are also areas with regeneration, especially on the Terra das Freiras farm. In São Mateus the environment is more degraded due to cattle grazing and there are few shrub areas.



5. Shrubs in São Mateus accompanying rocky areas, useful as a refuge for biodiversity.

HERBACEOUS VEGETATION

Due to the livestock uses of both farms, there is a good representation of grasses and legumes among the herbaceous species. The composition of the shrub layer is similar on both farms, with species such as *Sinapsis arvensis, Hordeum vulgare, Avena spp., Poa bulbosa, Poa pratensis, Erodium botrys, Vicia spp.* and *Trifolium spp*. among other species, many of which are of great interest for livestock.

DIAGNOSIS

By farms, Terra das Freiras is better preserved, with more shrubs and rocky areas where there is more regeneration, although many shrub areas are monospecific (*Cistus salvifolius*). Both farms, in general, have little regeneration, especially Sao Mateus, where shrubs are scarce and the soil is more compacted. Even so, due to the scattered water points (streams and puddles) and the few islands of existing scrub, we found acceptable biodiversity on both farms, with great potential. As a negative aspect, the low regeneration of Sao Mateus (both trees and shrubs), the absence of refuges (stones, plant debris, shrubs) and in both, trampling and soil compaction, due to the livestock load, stand out. Terra das Freiras has a greater presence of diverse shrubs and some regeneration, making it more interesting for biodiversity in general, as well as the presence of a pond suitable for amphibians, reptiles, insects and other groups. This pond has eroded banks, an aspect that will be corrected in the project measures.

In addition, special attention must be paid to invasive species. In this case, specimens of American perch (*Micropterus salmoides*) have been detected in the pond that is the object of the project.



6.The shrub *Calicotome villosa* is well represented in Terra das Freiras.

IMPLEMENTED SOLUTIONS BASED ON BUSH MANAGEMENT

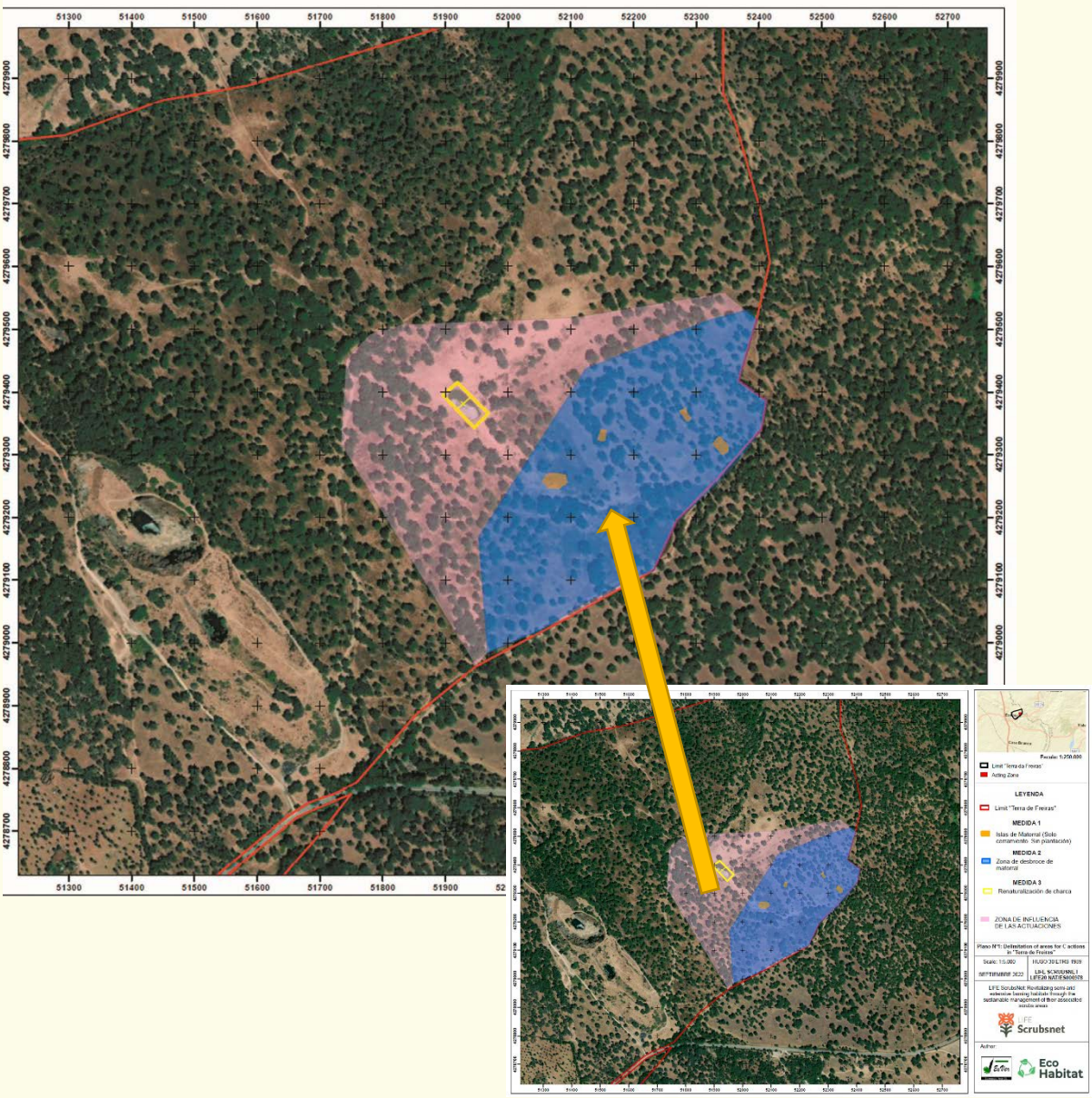
TERRA DAS FREIRAS. MEASURE 1. SCRUB ISLANDS

Four existing shrub islands will be fenced in this area to test the changes in regeneration and biodiversity in the islands when cattle do not interfere. 100 encapsulated cork oak acorns will be planted to see their evolution with the benefits of the shrub and the absence of cattle browsing. The image shows the detail of measure 1:



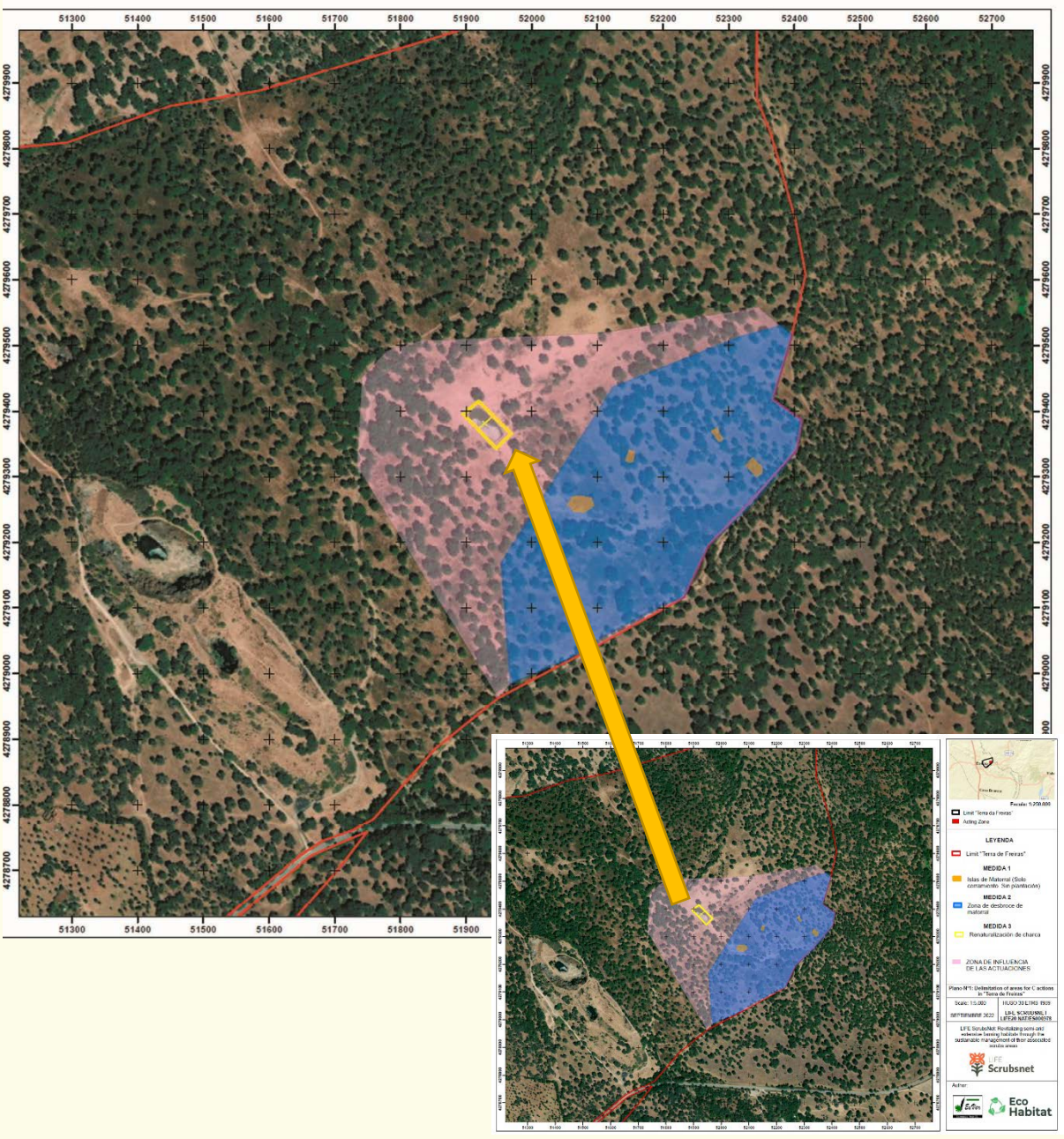
TERRA DAS FREIRAS. MEASURE 2. CLEARING OF SCRUBLAND

To encourage biodiverse scrubs, the scrubland of two existing species, *Rubus ulmifolius* and *Cistus salvifolius*, will be cleared in order to encourage the regeneration of other species of interest. The area will surround the area of measure 1. It will be cleared with a manual brush cutter, avoiding damaging other tree or shrub species. In the image you can see the detail of measure 2, in blue, the area to be cleared.



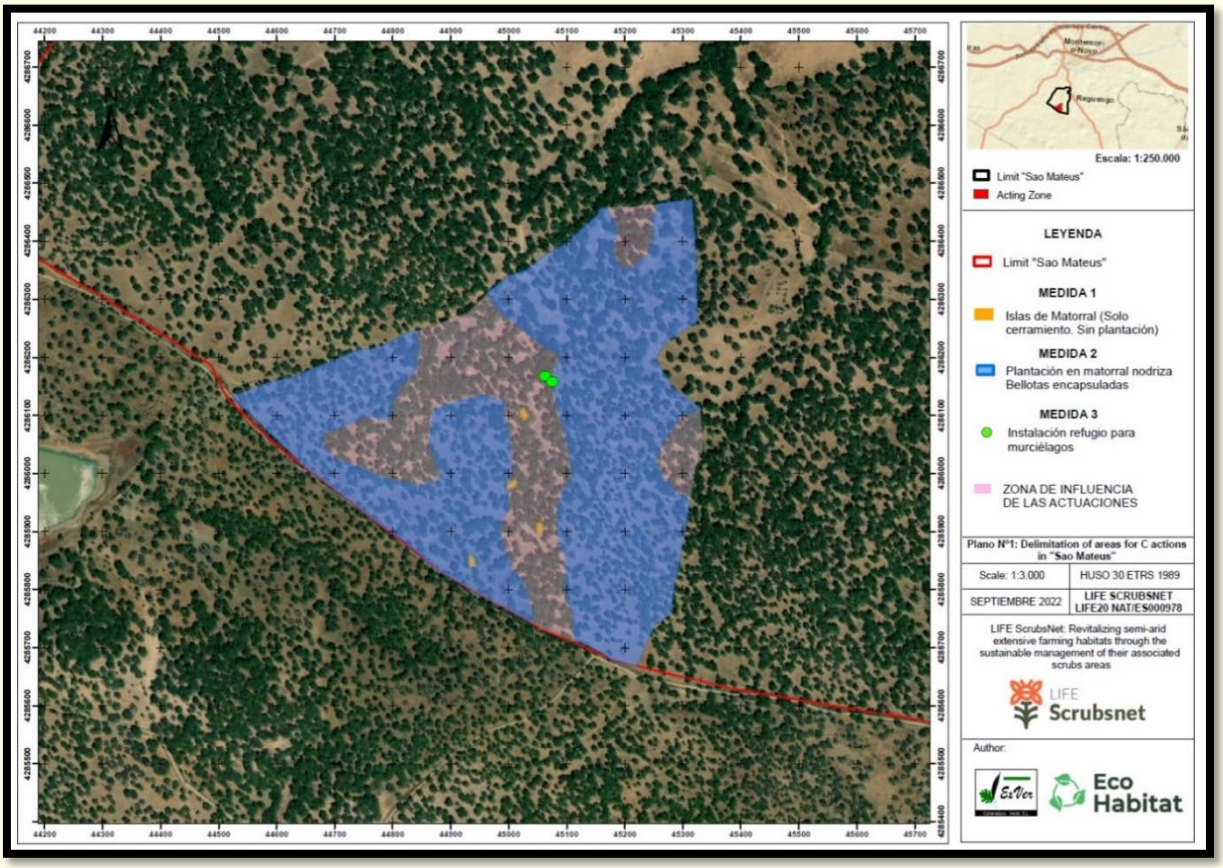
TERRA DAS FREIRAS. MEASURE 3. RENATURALISATION OF THE POND

The existing artificial pond on the farm is devoid of vegetation on the banks, so 150 plants are going to be planted on its banks, in addition to surrounding the pond with a fence of electro-welded mesh to prevent the passage of livestock. The species used are indicated at the end of the document. The planting will be done by hand to avoid impact on the environment. The image below shows the detail of measure 3.



SÃO MATEUS. MEASURE 1: SCRUB ISLANDS

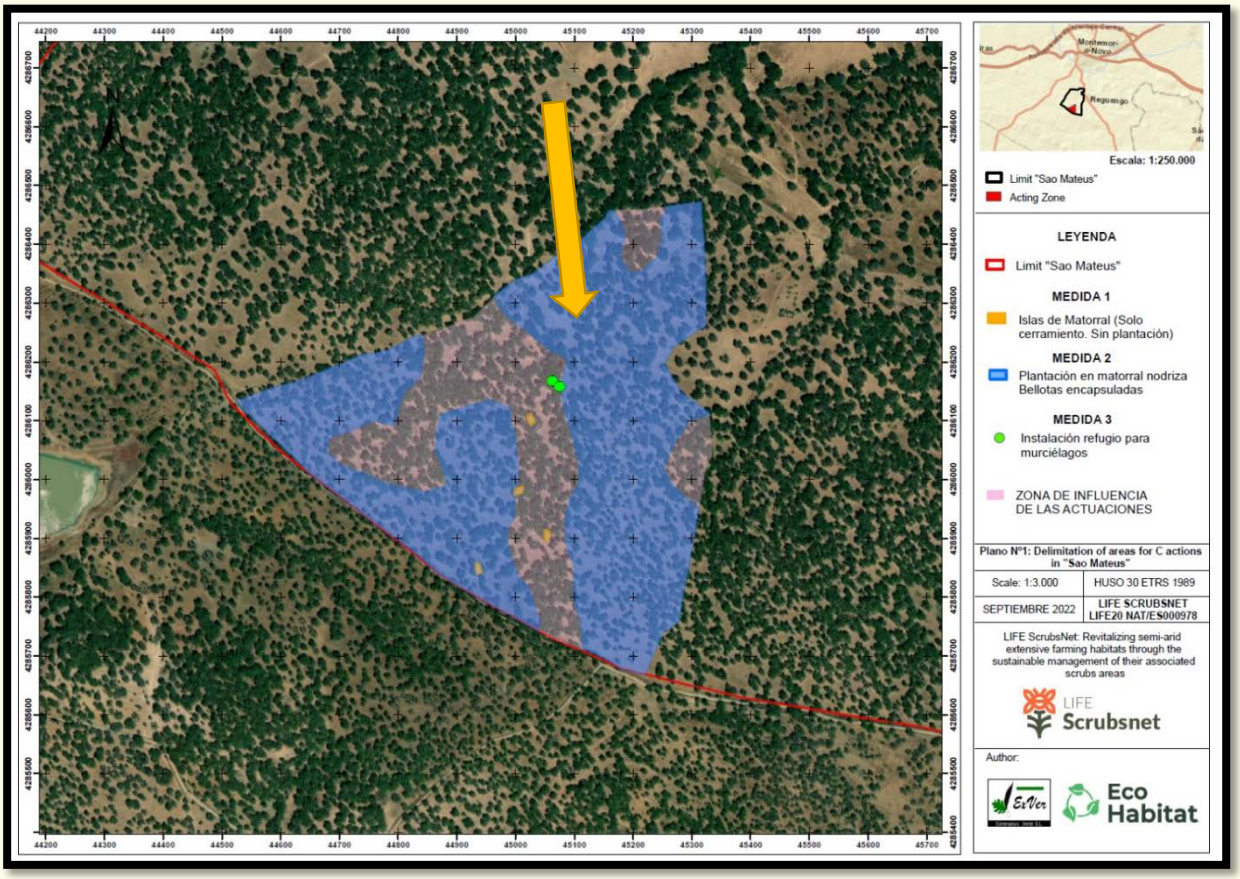
Four islands of existing shrubs will be fenced off with electro-welded mesh to test the evolution of regeneration and biodiversity when cattle do not interfere. No shrubs will be planted, but 100 cork oak acorns will be placed, encapsulated and planted by hand, to see their evolution with the benefits of the shrub and the absence of cattle browsing. In the image you can see, in the orange dots, the planting areas of measure 1.



SÃO MATEUS. MEASURE 2: PLANTING IN NURSE BUSHES

Taking advantage of the existing scrubland in the area, 300 cork oak seedlings and 300 encapsulated cork oak acorns will be planted, in order to see the evolution of these plantations under the protection offered by the scrubs that already exists naturally on the farm.

In the picture you can see, in the blue area, the planting areas of measure 2.



SÃO MATEUS. MEASURE 3: INSTALLATION OF BAT SHELTERS

In this measure there will be no action on vegetation or planting, the measure will consist of installing several bat roosts in the area (see image below) to encourage the presence of these species to function as controllers of forest insect pests. In the image, the roosts of measure 3 are shown in green.

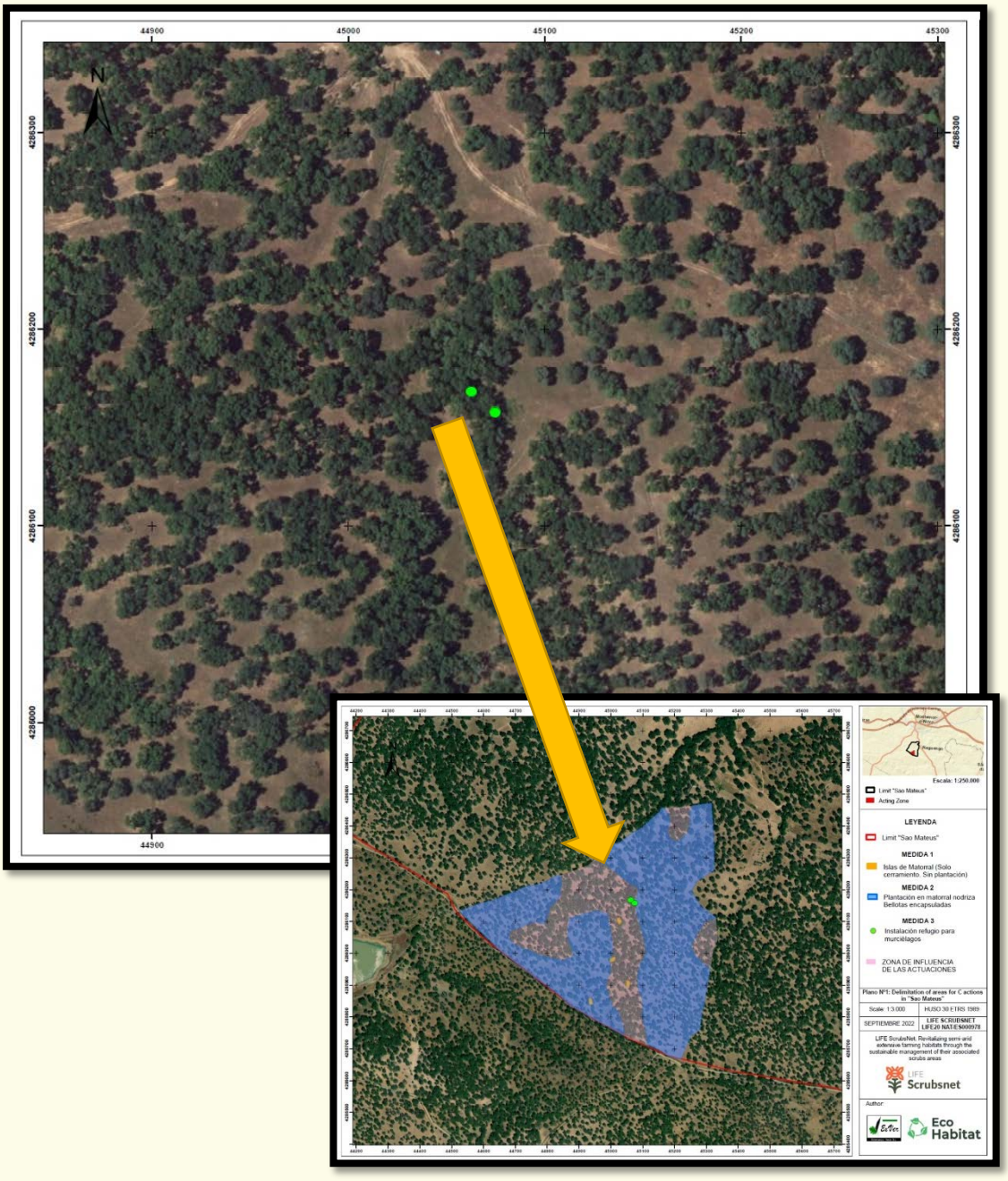


TABLE 1. PLANT SPECIES USED

TERRA DAS FREIRAS. MEASURE 3	
Planting inside the fence	*C. pseudocyperus*
	E. palustris
	C. longus
	S. holoschoenus
	I. pseudacorus
	M. aquatica.
	P. tuberosa
	M. pulegium

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INFORMATION SHEET

MONTE VALCORCHERO

Responsible Partner

Consejería Transición Ecológica y Sostenibilidad

JUNTA DE EXTREMADURA

Consejería para la Transición Ecológica y Sostenibilidad

NATURA 2000

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MONTE VALCORCHERO FARM

INFORMATION ABOUT THE FARM	
Name of the farm	Monte Valcorchero
Location	Plasencia (Cáceres) Spain
Surface	1184 ha.
Management	Public



DESCRIPTION OF THE FARM

The "Monte Valcorchero" farm is located in Plasencia (Cáceres). It is owned by Plasencia Town Council and has been declared a Protected Landscape within the Network of Protected Areas of Extremadura. The farm has approximately 1184 ha belonging to the Sierra del Gordo, in Plasencia. It is a largely pasture-covered woodland, made up of cork oaks, holm oaks and groves of hackberry trees, with rocky areas and shrubs such as the *majuelo* or *jarales*. The orography is very abrupt and irregular, with deep valleys and heights of up to 750 metres. The farm is dedicated to livestock, hunting, recreational activities, firewood, cork and mushroom extraction. The livestock is divided between the Avileña cow species, with around 258 head distributed over two plots, and 400 head of cattle on a different plot, in a total of 3 plots dedicated to this use on the mountain. In this way, the whole forest is occupied by cattle all year round. There are several very popular routes (on foot or by bicycle) for the citizens of Plasencia to explore the mountain and its springs.



2. 2. Image of the "Monte Valcorchero" farm on the right, the “Helechales” spring, located near the Data stream.

The wetlands on the farm are of great importance, both ecologically and for popular uses. It has a total of 14 ponds that are usually dry in summer, except for two that remain with water. It also has 3 wells. It is worth mentioning the large number of fountains scattered throughout its territory, of great heritage value, 32 in total, of which at least 14 are natural. There are several areas of waterlogging and minor springs in the shady areas of the farm, most of which suffer from summer drought.

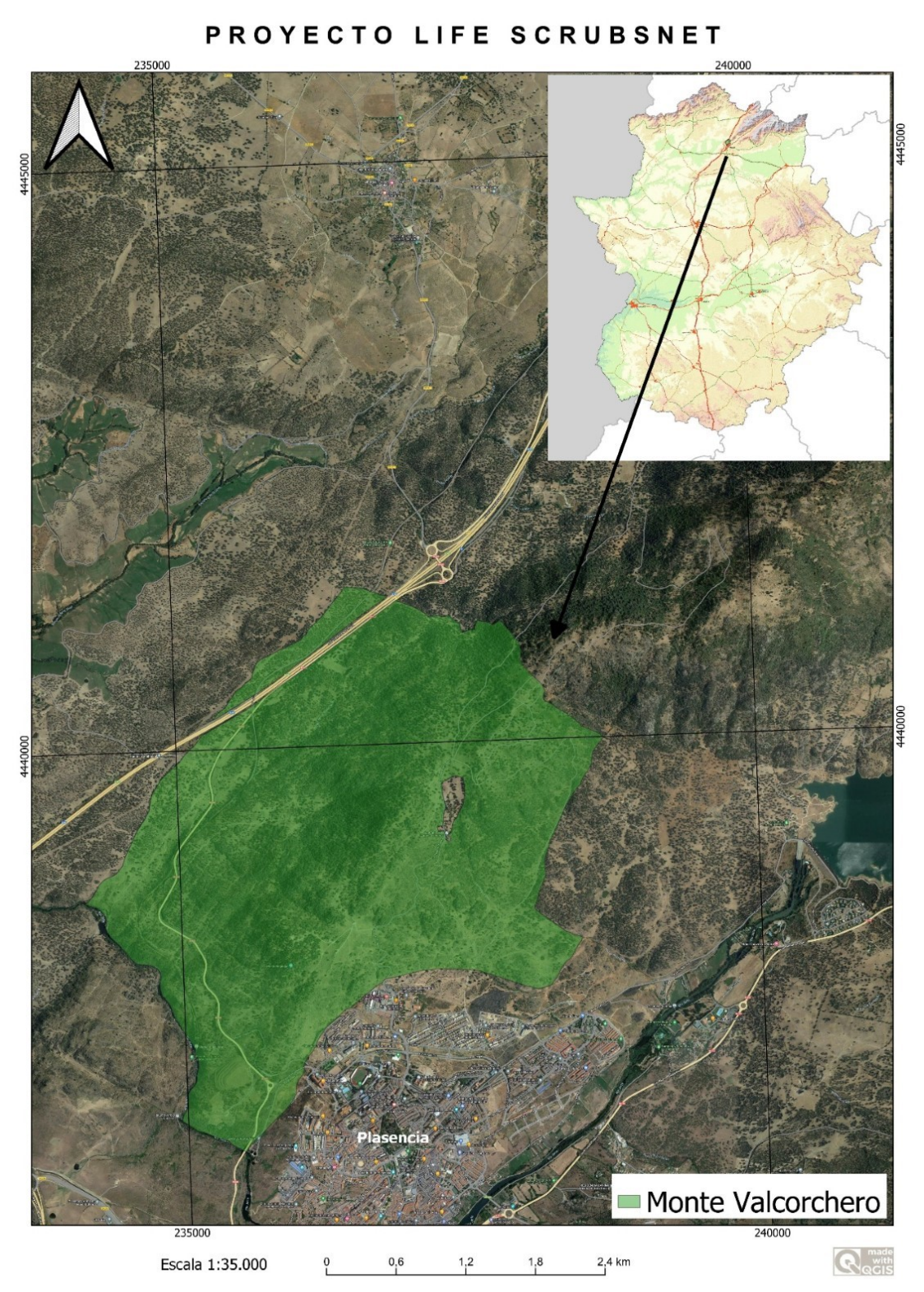
In general terms, the soil is poor, rocky, granitic, with some organic matter present, especially in the most forested areas and near rocky outcrops or shrub islands, due to the organic matter under the canopy. In some areas it is very compacted due to cattle trampling, excessively browsed and with little regeneration and

abundant slurry and excrements, which reach eutrophication of some ponds. There are a large number of rocky outcrops in the forest, which serve as a refuge from herbivory for the regeneration of trees and shrubs.

Several densifications of holm oaks and cork oaks have been carried out, although most of them have been unsuccessful due to the lack of maintenance in subsequent years, with almost all the trees drying out, so that only a few specimens have survived.



2. 2. Areas of granite rocks are very abundant on the farm.



3. Location map

BIODIVERSITY

HABITAT

The area is located within the SCI "Sierra de Gredos and Valle del Jerte". It is also affected by the SAC "Rivers Alagón and Jerte, to the south. In addition, the entire area is classified as a Protected Landscape, within the figures established by the Network of Protected Areas of Extremadura, due to its aesthetic and cultural values in the Community. It is a mountain made up of large granite outcrops and valleys of great environmental interest, as it is located in the transition between the high and low areas of Extremadura and the Castile-León plateau. In general terms, the state of biodiversity is considered to be good. There are many islands of scrubland, stone shelters very useful for biodiversity and deep soil in some areas due to leaf litter. The threats come from overgrazing by livestock and above all from the incorrect public use of the forest, which entails the risk of fire (with some major fires occurring in previous years), nuisance from motorbikes and motor traffic, abandonment of waste and others.

Within the SCI there are medium and high mountain areas, with habitats of great interest, such as the dehesas (6310), *Quercus ilex* and *Quercus rotundifolia* forests (code 9340), some of which are of high priority and high interest for fauna, such as the Mediterranean Ponds (code 3170).

In the fauna, by groups, the following species are worth mentioning:

Birds: Given the forestry nature of the farm, forest species such as the nuthatch, the jay or the oriole can be identified. There is also an abundance of birds of prey, such as the golden eagle, short-toed eagle, buzzard, griffon vulture, booted eagle and red kite.

Mammals: The chiroptera stand out, with species such as the medium-sized buzzard bat or the forest buzzard bat and other mammals such as the Iberian desman (these two species are also keystone species), the badger, the fox, the marten and the otter.

Reptiles: The horseshoe snake, the Iberian lizard and the bastard snake live in the sunniest areas of the farm, in rocky areas and areas with shelters. This is one of the few areas in Extremadura where the Carpetan lizard is present, among other reptiles such as the ocellated lizard or the black-green lizard.

Amphibians: In the fountains, pylons and springs of the farm there are abundant populations of the common salamander or endemic species such as the Iberian newt and the common toad. As a more generalist species and in the lower areas, the common toad and the common frog stand out.

Finally, in the group of arthropods, it stands out for being one of the few areas in which the European stag beetle is found in the community, also a key species.



4. Iberian-Maghreb endemism present on the farm: salamander.

GENERAL AND HEALTH STATUS OF SHRUBS AND TREES

ARBOREAL VEGETATION

Monte Valcorchero is a very steep and stony woodland with mainly holm oaks and cork oaks. The ages are varied, although in general there are many aged trees, with regeneration in bushes and rocky areas.

The arboreal vegetation on the farm includes several species of the Quercus genus: *Quercus ilex, Quercus suber* and *Quercus faginea*. Other species that are also abundant, especially on rocky areas facing east, are hackberry and wild olive. The state of regeneration is good in rocky areas and deficient in pastoral areas, due to livestock grazing.

From a health point of view, there are several scattered outbreaks of *P. cinnamomi* throughout the farm, as well as very old specimens. There are also numerous dead specimens as a result of old age and fires in previous years.

With regard to regeneration, there is good regeneration where shrubs are abundant and in stony areas, and it is absent in areas with high livestock grazing intensity.



5. Group of cork oaks on the farm.

SHRUB VEGETATION

The shrub vegetation, favoured by the rocky and higher areas, includes the following species: *Rubus ulmifolius, Cistus ladanifer, Rosa spp., Retama sphaerocarpa, Pyrus bourgaeana, Crataegus monogyma* and *Ruscus aculeatus*.

The scrubland is well represented, with brambles, broom, broom, broom, hackberry, hawthorn, rockrose and wild rose as the main species. The thorny fringe, especially in wet areas, is well represented.

HERBACEOUS VEGETATION

There are no herbaceous plantations, and this vegetation is limited to the spontaneous vegetation common in the dehesas, grasses and leguminous plants of great interest for livestock feed. These include *Poa spp., Trifolium spp.* and *Lupinus albus.*

DIAGNOSIS

In general terms, the state of biodiversity is considered good, due to the presence of rocky islands with abundant shrubby vegetation with various species (rocks, broom, brambles, hawthorns) useful for fauna. Furthermore, these rocky areas favour the regeneration of trees, something that is scarce in the rest of the property, given its uses for livestock. The main threats come from overgrazing by cattle and, above all, the public misuse of the forest, since there are frequent outbreaks of fires, nuisance caused by motorbikes and car traffic, the abandonment of waste in certain areas and, in some cases, although only occasionally, invasive species such as gambusia, present in the hermitage pylon "Virgen del Puerto".

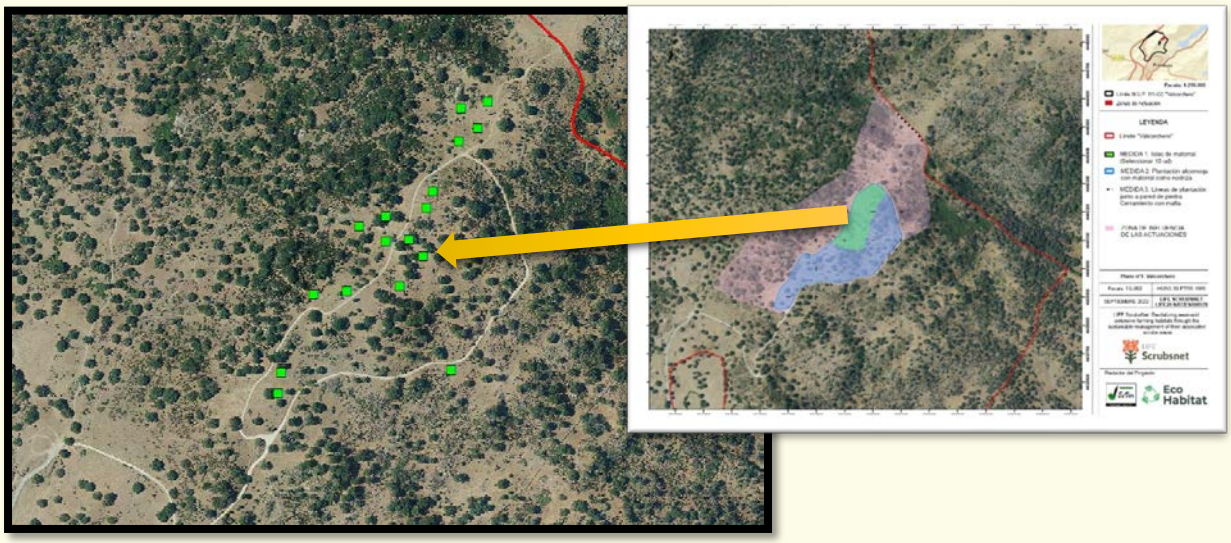


6. Areas with dry stands of trees and unsuccessful tree regeneration actions.

IMPLEMENTED SOLUTIONS BASED ON BUSH MANAGEMENT

MEASURE 1. ISLANDS OF BIODIVERSE SCRUBLAND

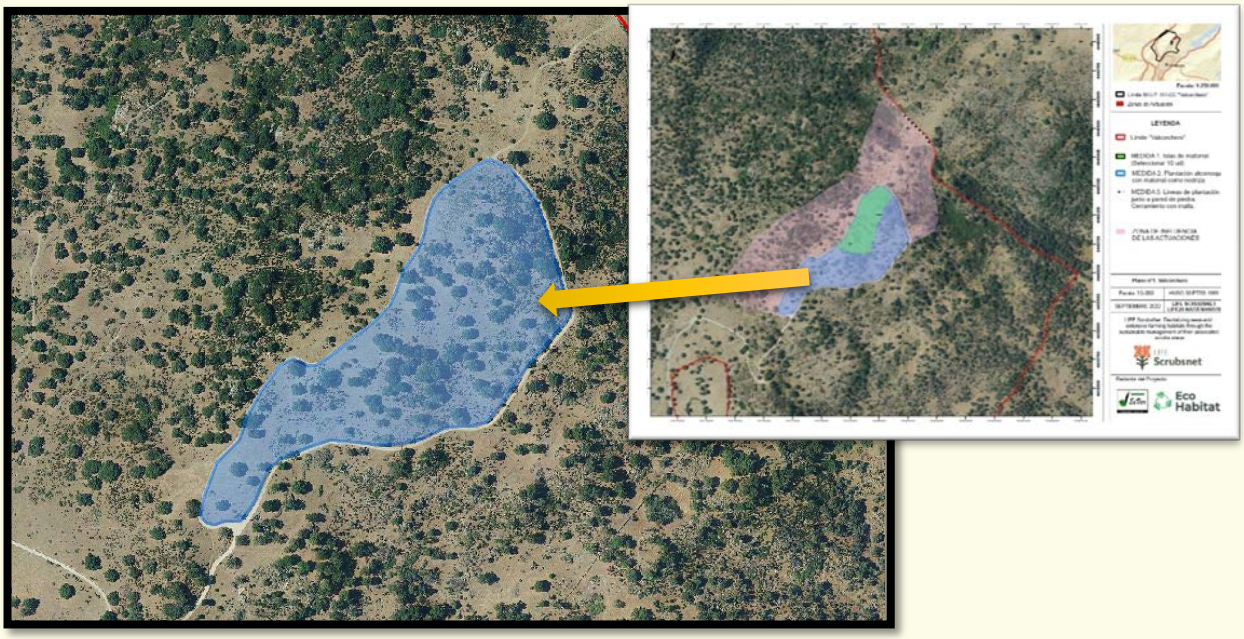
To promote biodiversity on the farm, islands of biodiverse scrubland will be created, where a known number of species and specimens of each will be introduced on a closed structure, which will be replicated on the pilot farms. A total of 10 bush islands will be placed, with a total of 12 species, with 13 specimens of each of them, which together will make a total of 156 plants per island. The image shows the detail of ACTION 1:



MEASURE 2. NURSE BUSHES FOR CORK OAK REGENERATION

It has been observed on the farm that regeneration in the thorny bush areas is important, with *Quercus* growing in these areas. This is because cattle do not enter these areas, allowing the *Quercus* species to grow. In this measure we intend to replicate that same process, favouring shrubs and the regeneration that goes with them. To this end, areas will be selected with wild pear, hawthorn or wild rose trees, species with thorns that make access difficult for livestock. Then, 200 encapsulated acorns will be planted manually, to avoid predation by rodents or birds. Each seed will be protected with wool mulch or similar and replenished if necessary in the following seasons.

The image shows the detail of MEASURE 2:



MEASURE 3. LINEAR HEDGEROW PLANTINGS OF BIODIVERSE SCRUBLAND

Taking advantage of a dry stone wall in poor condition in the area, the potential of this construction will be used as a generator of biodiversity, both for fauna and flora. To this end, a shrub will be rebuilt and planted for every metre along its length (150 metres), which will result in the planting of 150 plants of thorny species, such as bramble or wild rose. In addition, a cork oak tree will be planted every 10 metres, in order to promote the regeneration of the trees along the 150 metres. Both the shrubs and the cork oaks will be planted manually. The entire plantation will be protected by a mesh fence.

All plantations will be subjected to regular maintenance and monitoring to ensure their success. The image shows the detail of MEASURE 3:

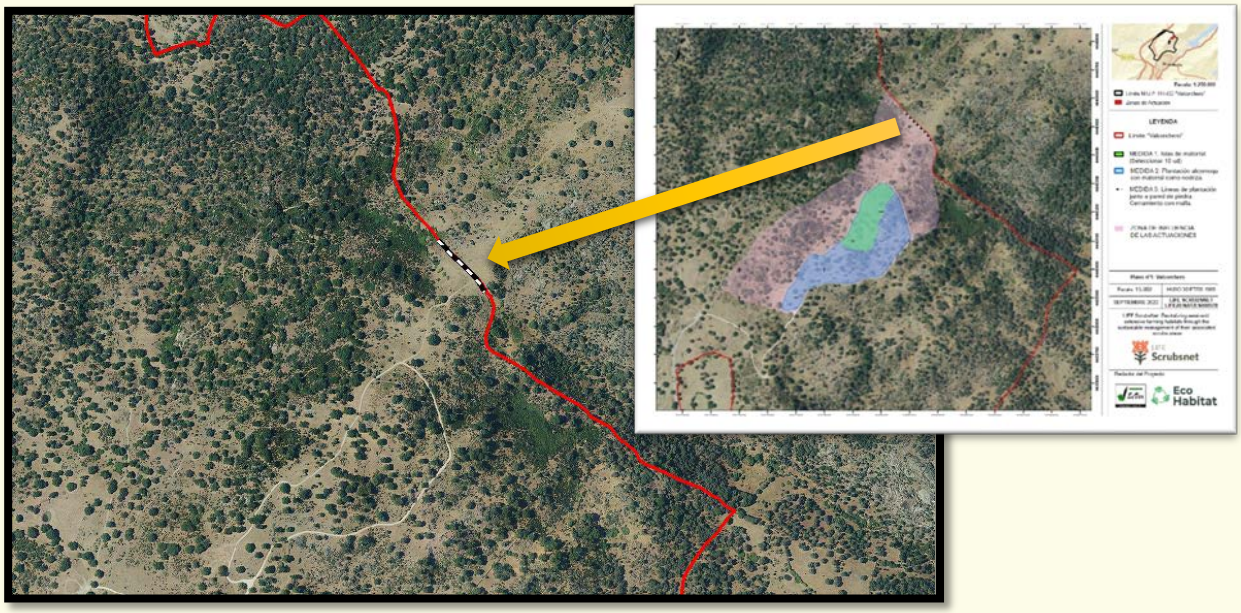


TABLE 1. SHRUB SPECIES USED

MEASURE 1	
Islands of biodiverse scrubland	*Cistus salvifolius*
	Cistus monspeliensis
	Cistus crispus
	Thymus vulgaris
	Salvia romarinus
	Teucrium fruticans
	Genista hirsuta *Cytisus scoparius*
	Retama sphaerocarpa
	Arbutus unedo
	Phyllirea angustifolia
	Myrtus comunis
MEASURE 3	
Linear hedgerow plantings of biodiverse scrubland	*Pyrus bourgaeana*
	Rubus ulmifolius
	Crataegus monogyna

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Revitalizing semi-arid extensive farming habitats through the sustainable management of their associated scrubs areas

INFORMATION SHEET
DEHESA SAN FRANCISCO

Responsible Partner

Consejería Transición Ecológica y Sostenibilidad

JUNTA DE EXTREMADURA
Consejería para la Transición Ecológica y Sostenibilidad

Life programme
The LIFE Scrubsnet project is co-financed by the European Union through the LIFE LIFE20 NAT/ES/000978 programme.

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DEHESA SAN FRANCISCO FARM

INFORMATION ABOUT THE FARM	
Name of the farm	**Dehesa San Francisco**
Location	**Santa Olalla del Cala (Huelva) Spain**
Surface	**516 ha.**
Management	**Private**



DESCRIPTION OF THE FARM

The "Dehesa San Francisco" farm is located in Santa Olalla del Cala (Huelva, Spain). It is a pasture land, with areas of pasture and Mediterranean scrubland in the areas with the most accentuated orography. The total area is approximately 516 ha, owned by the Monte Mediterráneo Foundation. The farm is dedicated to livestock farming, cork extraction, various crops, mycology and a training/education area. The livestock consists of sheep (625 in total, Merino), pigs (approximately 345, Iberian breed) and cattle (32 Retinta), with a token presence of goats and horses. The extraction of cork is of great importance, with a future estimate of 161,000 kg in the year 2023. With regard to crops, 14,000 kg of hay is extracted, as a result of sowing leguminous and grasses on approximately 2 ha. The mycological exploitation is mainly based on the gurumelo (*Amanita ponderosa*) of which 4,500 kg were harvested in 2021. Finally, there is also an environmental, agricultural and forestry training centre on the farm, which is attended by approximately 100 students per year.



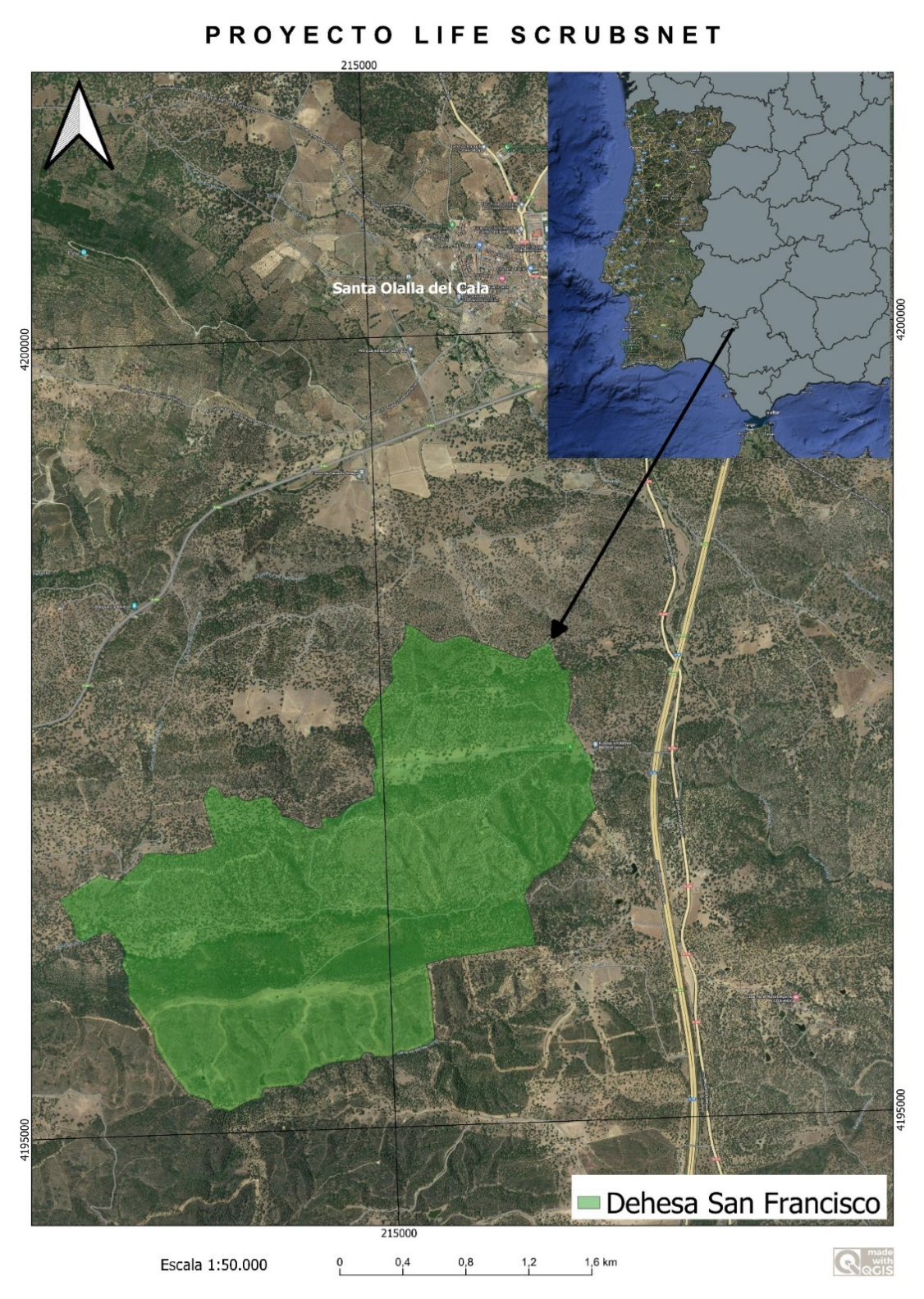
3. Image of the Dehesa San Francisco Farm

The forestry work and related actions are part of the Technical Management Plan PTO/HU/2016/038. Several actions were carried out to improve the biodiversity of the property, such as the installation of shelters, exit ramps and nest boxes. Several reforestations have been carried out on an estimated area of 100 ha. The species used have been mainly of the *Quercus* genus. Periodically, areas with rock and other shrub species are cleared for various purposes, such as fire control or to promote the presence of pasture for livestock.



2. Livestock present on the Dehesa San Francisco farm

The farm has several seasonal streams, 12 ponds (only 4 keep water all year round), 6 wells and other scattered water points, such as several cisterns and several pools. In general, the soil is poor, of the slate- quartzite type, with a fairly steep orography ranging from 380 to 532 metres. No action is taken to improve the soil, but care is taken not to encourage soil loss during forestry work. All clearing is carried out without removing the soil, in order to favour soil conservation and avoid laminar erosion, given the steep slope of many of the affected areas. The only areas where disc harrows are used are the areas where firebreaks are made.



3. Location map

BIODIVERSITY

HABITAT

The entire property is located within the Natura 2000 Network, in the Natural Park of Sierra de Aracena y Picos de Aroche, in an area of great ecological importance, since it perfectly represents the cork oak forests of the southwestern Iberian Peninsula. There are 20 Habitats of Community Interest represented in the farm, such as the most abundant, 6310 (montados of evergreen *Quercus spp.*), river banks such as 91B0 (*Fraxinus angustifolia* thermophilous ash groves) or some of a priority nature such as 3170 * (Mediterranean temporary ponds), the latter of great interest for herpetofauna. Among the more than 216 species of vertebrates cited in the area, there are species of great importance. By groups, the following stand out:

Birds: The herpetofauna is a breeding area for large birds of prey, such as the Iberian Imperial Eagle, the Short-toed Eagle, the Black Vulture and the Griffon Vulture. There are also wintering birds, such as the kite, or summer visitors, such as the bee-eater. Besides this, taking advantage of the ponds and streams, there are species of birds associated to the water courses, such as the black stork and the white stork. In the group of insectivores, there is the great tit or the lesser spotted woodpecker in the more forested species.

Mammals: Taking advantage of the holes in the trees are bats, such as the greater horseshoe bat. Among the macro and mesomammals we can observe the badger, the genet, the fox, the boar and the mink.

Fish: This is not a group with a large number of species in the area, given the temporary nature of the water points, although some species such as the saramugo stand out.

Amphibians: These are well represented, with bioindicator species such as the yellow-spotted salamander, the chorus frog or the Iberian midwife frog.

Reptiles: Species associated with rocky or dry areas, such as the Iberian lizard or the horseshoe snake, or with aquatic areas, such as the collared water snake and the viperine water snake. Although scarce, the endangered mackerel is also present.



4. Fauna of San Francisco: Pygmy Newt

GENERAL AND HEALTH STATUS OF SHRUBS AND TREES

ARBOREAL VEGETATION

The existing arboreal vegetation on the farm corresponds to *Quercus suber, Quercus ilex* and to a lesser extent *Quercus faginea*, with a very differentiated state of regeneration between areas, ranging from nil in areas with more livestock to acceptable in areas without livestock or with few head per hectare. There are also riverside areas formed by willows, poplars and oleanders and patches of Mediterranean scrub with scattered scrub. From the health point of view, there are approximately 80 hectares affected by *P. cinnamomi*, as well as damage by *Cerambyx sp*. and *Coroebus florentinus* within the farm, and there are some specimens of *Quercus ilex/suber* that are aged and with leaf decay due to fungi.

SHRUB VEGETATION

As for the state and regeneration of the bush, it depends on the climatic and orographic conditions of the different areas of the farm, although it is true that there are few bare areas, so that the floristic diversity in the stratum, except for specific areas, is well represented and is considered good or acceptable. Even so, there are some cases of overgrazing and alteration of the vegetation, especially in areas where pigs graze and on the margins of ponds trampled by cows.

The scrubland patches are mainly made up of rockrushes, heaths, gorse and broom. A detailed list of shrub species is given below:

Shrubs present in Dehesa San Francisco
Cistus ladanifer, Cistus crispus, Ulex parvifolius, lavándula sp, Erica sp. Olea europaea var. Sylvestris, Cistus populifolius, Cistus crispus, Cistus salviifolius, Cistus laurifolius, Cistus albidus, Cistus monspeliensis, Lavandula pedunculata, Lavandula stoechas, Retama monosperma, Retama sphaerocarpa, Phlomis purpurea, Daphne gnidium, Phyllirea angustifolia, Asparagus albus, Myrtus communis, Pistacea lentiscus y Genista hirsuta.

HERBACEOUS VEGETATION

There is a good representation of herbaceous plants, especially grasses (*Aegilops geniculata, Aegilops triuncialis, Bromus diandrus, Bromus rubens, Bromus hordeaceus, Lolium rigidum, Lolium perenne, Avena sterilis and Poa bulbosa*). Leguminous plants (*Triflolium sp., Ornithopus sp., Vicia cracca, Vicia sativa, Lupinus angustifolius, Lupinus albus, Medicago sp.*) are also abundant. These herbaceous species are of great interest for feeding the livestock present in the dehesa.



5. . Meadows with holm oaks (left) and Mediterranean scrub on the farm (right).

DIAGNOSIS

In general terms, the state of biodiversity is considered good, with areas of greater interest given the high regeneration (patches of various bushes), a good presence of trees and several important temporary water points. From a negative point of view, the absence of refuges for fauna (stones, trunks, remains of vegetation), laminar soil erosion and areas with little regeneration of shrubs and trees, as well as trampling and soil compaction by cattle, stand out.

There are some areas of the farm with high erosion due to the loss of topsoil by cattle, although some shrub regeneration is observed year after year, partially compensating this problem.

The ponds are highly eutrophicated (November 2022) due to the leaching of cattle manure and plant matter from the streams that feed them. There are widespread drought problems in the territory, with wells and ponds completely dry, some of which have been dry for some years. At the time of the study (2022), only 4 ponds, including the one under study, still had water.



6. Prickly rockrose (*Cistus ladanifer*) is well represented on the farm.

IMPLEMENTED SOLUTIONS BASED ON SCRUB MANAGEMENT

MEASURE 1. POND RENATURATION

The farm has a swamp with a high level of eutrophication and highly eroded banks due to the presence of cattle. The aim of this measure is to restore and promote biodiversity at this swamp. To that end a perimeter fence will be erected around the swamp, with cattle nets. A 80-metre long net will also be installed in the centre of the swamp, to divide it in two, with one part providing access for livestock and the other for the recovery of the vegetation. On the other hand, an enclosure will be built on both sides of the drainage for a length of approximately 45 metres (on each side). A gabion will be built over this drain downstream of the swamp, where the drainage network will be closed. Three cubic metres of dry masonry gabion will be placed.

Various planting will be done in this area; in the first line (within the fenced area), in the second line (other species), linear planting in the drainage enclosure, planting in the gabions, planting of tree ash in existing cages at the swamp and 5 pots with reeds will be introduced inside the swamp. Within the fenced areas various planting will be carried out, with the species detailed in the table. In addition, a stone will be placed for amphibians.

The picture shows the detail of MEASURE 1:

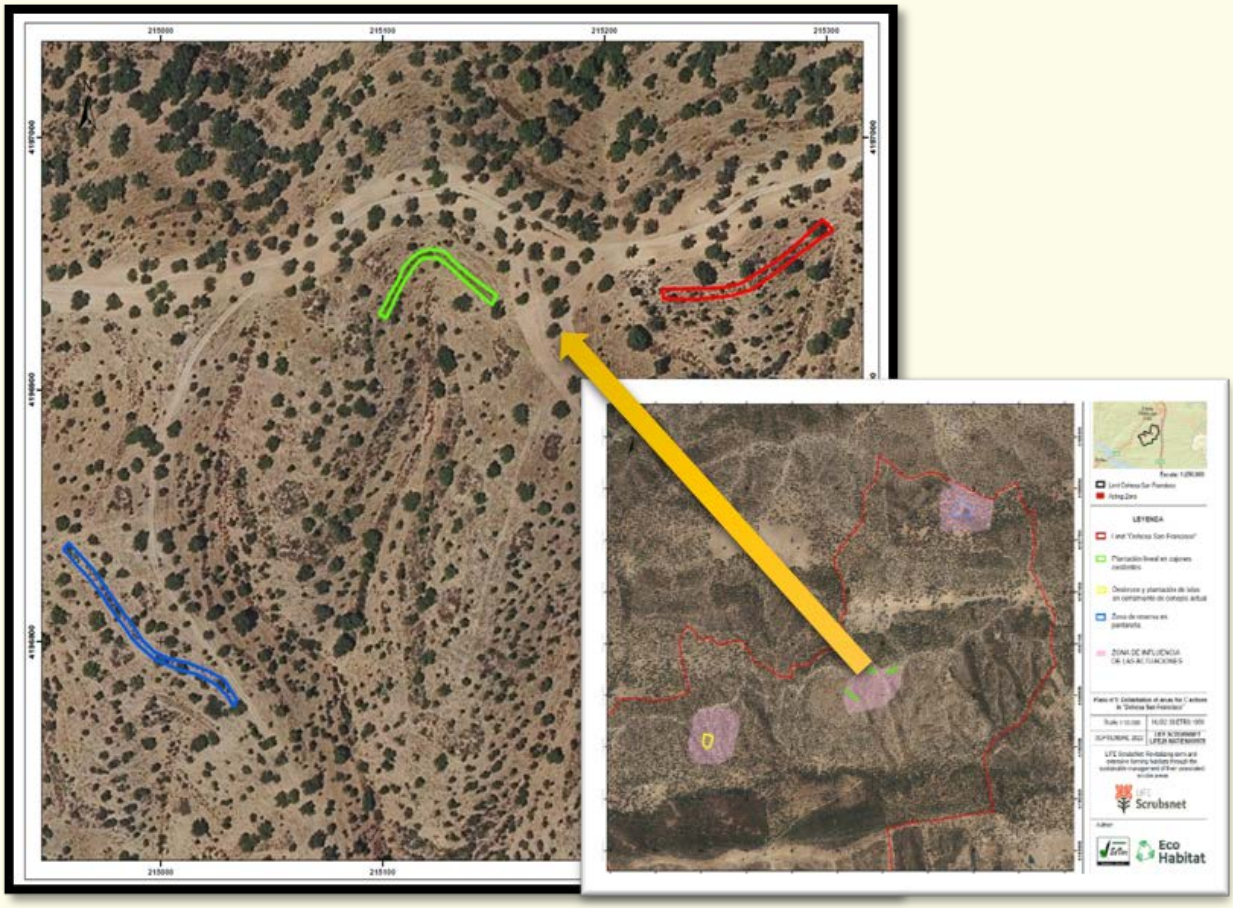


MEASURE 2. PLANTING OF HEDGES IN EXISTING BOXES

Three fenced corridors will be imporved throguh the following actions:

-Elimination of any dry or weak stems that may exist within, as well as pruning and guiding existing ones. Subsequently, linear planting of shrub hedges, at a spacing of 1 metre. The planting will be of 75 units of each of the species indicated in the table. Drip irrigation will be installed with a hose and a flow rate of 2l/h.

The image shows the detail of MEASURE 2:



MEASURE 3. SCRUBLAND ISLANDS IN A RABBIT ENCLOSURE

In order to encourage the presence of rabbits, in a previously selected and fenced area, a clearing and thinning of the standing bushes will be carried out in part of the area of action. In this area, 10 islands of biodiverse scrub will be planted, which will have an equal composition of species, with a total of 300 plants. Per species, 25 units of each of the species indicated in the table will be planted. To finalise this action, the construction of 3 cairns and 3 tarameros, 5 shelters for bats, 2 nesting boxes and 3 insect hotels is foreseen.

The picture shows the detail of MEASURE 3:



TABLE 1. SHRUB SPECIES USED

MEASURE1	
Linear planting over the drain	*P. bougaeana*
Pond cages	*R. ultmifolius*
	C. monogyna
	Q. suber
	Fraxinus sp.
Planting on gabions	*Salvia spp*
	Retama sphaerocarpa
	Q. ilex
	Lavandula stoechas
Ceramic pots	*Juncus spp.*
First line pond	*C. pseudocyperus*
	E. palustris
	C. longus
	S. holoschoenus
	I. pseudacorus
	M. aquatica
	M. puleginum
	P. tuberosa
Second line pond	*Nerium oleander*
	Flueggea tinctoria
	Rosa canina
MEASURE 2	
Hedge planting in existing fenced corridors	*Salvia Rosmarinus,*
	Retama sphaerocarpa,
	Arbutus unedo y
	Pistacea lentiscus
MEASURE 3	
Islands of scrubland in rabbit enclosure	*Cistus salviifolius*
	Cistus monspeliensis
	Cistus crispus
	Thymus vulgaris
	Salvia rosmarinus
	Teucrium fruticans
	Genista hirsuta
	Cytisus scoparius
	Retama sphaerocarpa
	Arbutus unedo
	Phyllirea angustifolia
	Myrtus comunis

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INFORMATION SHEET
DEHESA COMUNAL DE SIRUELA

Responsible Partner

Consejería Transición Ecológica y Sostenibilidad

JUNTA DE EXTREMADURA
Consejería para la Transición Ecológica y Sostenibilidad

Life programme
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DEHESA COMUNAL DE SIRUELA STATE

INFORMATION ABOUT THE FARM	
Name of the farm	**Dehesa Comunal de Siruela**
Location	**Siruela (Badajoz) Spain**
Surface	**5.666 ha.**
Management	**Public**



DESCRIPTION OF THE FARM

The farm is made up of a meadow of holm oaks, pastures and several seasonal streams and ponds, with a gentle orography except in areas close to the Serena reservoir, with altitudes ranging between 200 and 450 metres. The total area is 5,666 ha, owned by Siruela Town Council. The land is used for livestock farming and agriculture, with 90 plots dedicated to sheep and 85 plots dedicated to arable farming, mainly dry crops, under lease. The grazing plots are approximately 40 ha each, enclosed with livestock netting.

Grazing contracts are annual and crop rotation (grazing-grazing) takes place every 5 years. The number of animals is approximately 17,000 Merino sheep. Uses have not changed in recent years, although the number of livestock on the farm has gradually increased, with the corresponding negative effect on the soil through trampling and compaction, regeneration and scrub, which is practically non-existent on the farm. In summer, supplementary feed has to be given to the animals, approximately 700,000 kg of feed, 150,000 kg of hay, 90,000 kg of straw and 150,000 kg of cereal.

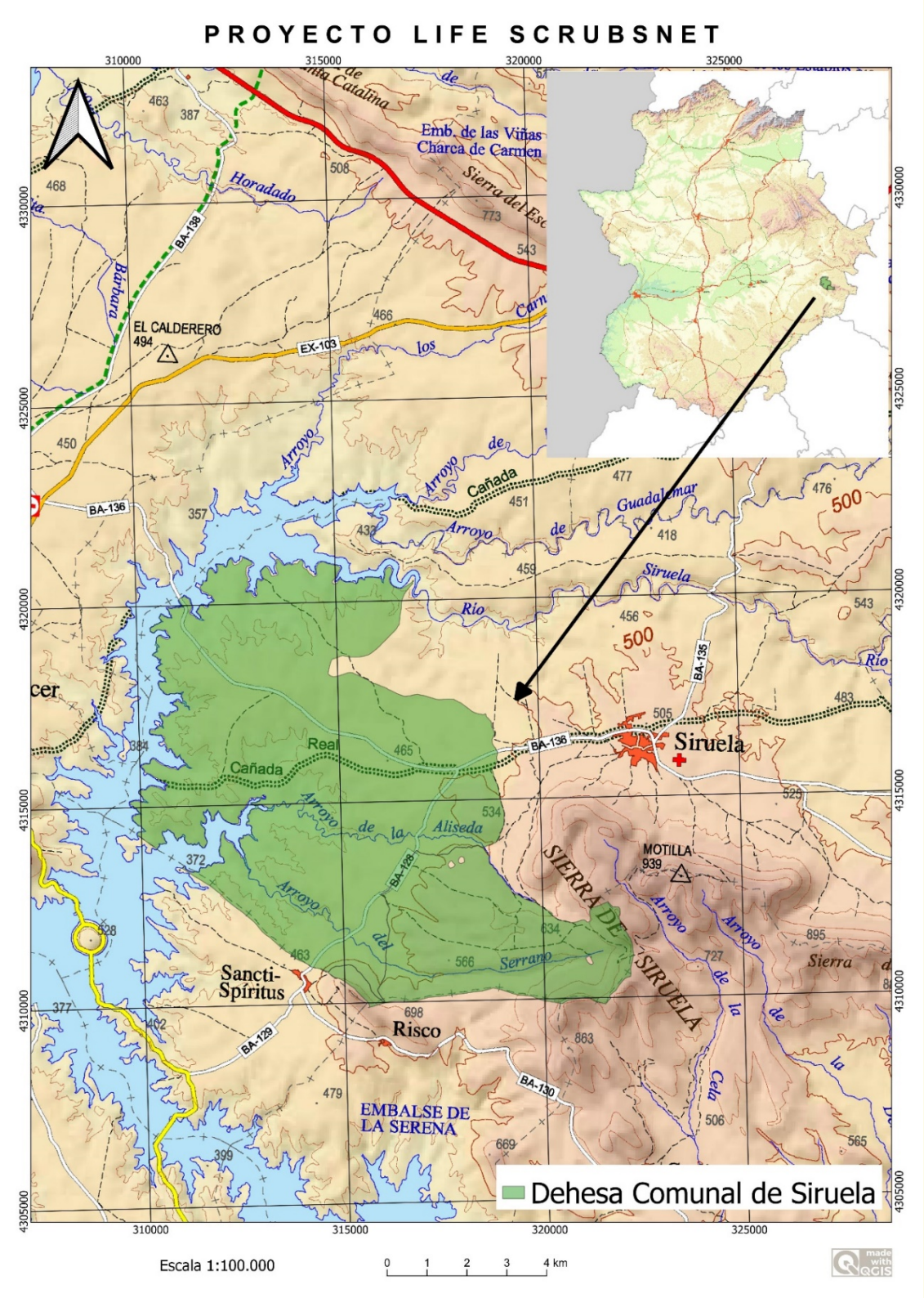


4. Images of the farm

The water resource is important for the use of the farm, although the episodes of water shortage have increased in recent years due to repeated droughts and the low retention of this resource in the bare and poor soil. There are 3 natural ponds with a capacity of approximately 150 cubic metres, although only one of them holds water all year round. With regard to artificial ponds, there are 80 ponds with a capacity of 24,000 cubic metres. There is also a reservoir of 350 cubic metres and 4 wells. Due to the scarcity of water, in some years it has been necessary to transfer water from the reservoir of La Serena, 400 cubic metres.The soil is poor, very eroded and with little organic matter on the surface, compacted and very stony in some areas. Solid fertiliser is added every 5 years, 150 kg/ha in tillage.



2. Images of the Cañada Real on the farm.



3. Location map

BIODIVERSITY

HABITAT

The property is included in several protected areas within the Natura 2000 Network, in the category of SPA and SAC Sierra de Siruela, SPA Embalse de La Serena and SAC Corredores de Siruela, as well as being close to the "La Siberia" Biosphere Reserve. It is made up of mountain ranges of quartzite origin with gentle slopes and variable orography, large plains and reservoirs, such as La Serena. There are various Habitats of Community Interest represented in the area, some present on the property, such as the montados (code 6310) and others scarce or absent in the project areas or within the property, such as the oak grove of *Quercus faginea* (code 9240) or with an important representation of shrubs such as the Oromediterranean heaths with thorny broom (code 4090). There are also riparian areas such as Habitat 91B0 (Thermophilous *Fraxinus angustifolia*). Although these habitats are of great environmental interest, within the property they are mostly absent and the environment is reduced to holm oak grassland and pasture with abundant old trees.



4. Fauna present in the ponds on the farm: European pond turtle.

GENERAL AND HEALTH STATUS OF SHRUBS AND TREES

ARBOREAL VEGETATION

The existing tree vegetation on the property comprises a single species, *Quercus ilex*. The soil of the property corresponds to an advanced stage of degradation of the original Holm oak, in a state of near grazing on most of its surface. The state of regeneration is scarce or non-existent, due to the high rate of livestock stocking. From a health point of view, there are outbreaks of *P. cinnamomi*, widespread throughout the property, as well as other damage such as very old or excessively pruned specimens. There is also leaf decomposition possibly due to fungi and numerous dead specimens as a result of their advanced age and exploitation of the area (ploughing under the canopy, trampling, accumulation of excrement and leaching on the trees…).

SHRUB VEGETATION

Patches of scrub are very scarce, almost non-existent and limited to ditches or roadsides. Overgrazing does not allow the regeneration of the few existing shrubs, consisting of *Retama sphaerocarpa* and a few branching specimens of *Lavandula spp*.

HERBACEOUS VEGETATION

Given the agricultural and livestock farming uses of the area, rain-fed cereals such as wheat or oats are periodically planted in some plots. In the rest, there are abundant grasses and leguminous plants of great nutritional value for livestock, such as *Vicia spp*. and *Trifolium spp.*



5. The surface of the farm is highly eroded and without regeneration.

DIAGNOSIS

In general terms, the state of biodiversity is considered poor, due to the increasingly intensive uses of agriculture and livestock in the area. There are virtually no shrubs or regeneration of shrubs and trees, due to frequent trampling and compaction of the soil by cattle and the effects of grazing. The ponds have bare banks and sediment accumulation, and there is an absence of refugia such as stones, logs or vegetation remnants. It is therefore essential to exploit the potential of the biodiverse shrub as a key element in promoting biodiversity on the farm. Measures to prevent water loss are also planned, along with other measures to promote habitat and shelter for wildlife species.

These measures are detailed below.



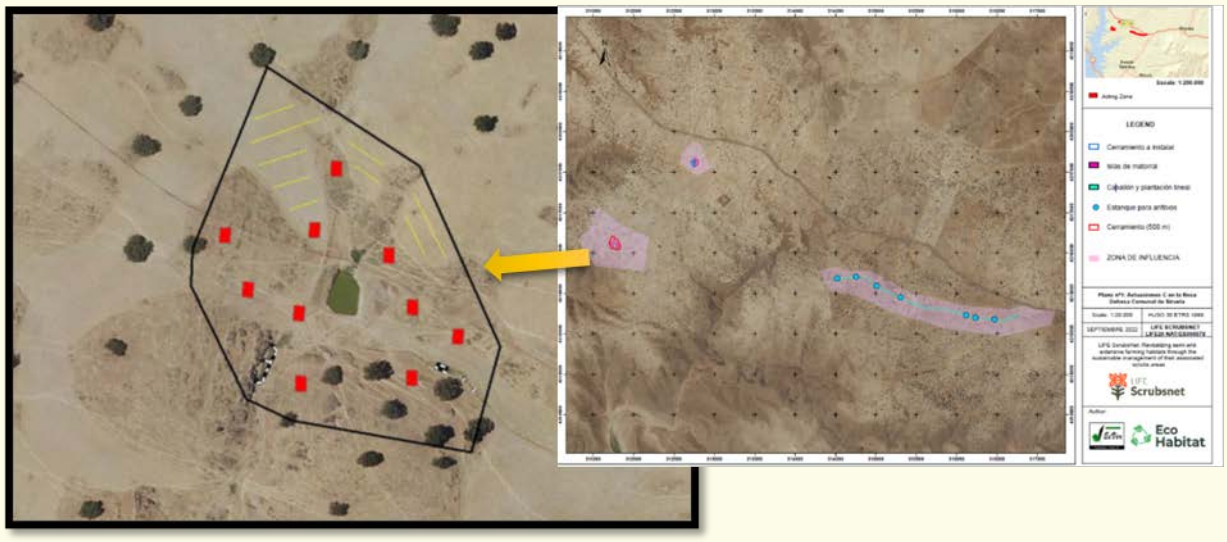
6. The lizard in the performance area.

IMPLEMENTED SOLUTIONS BASED ON BUSH MANAGEMENT

MEASURE 1. ENCLOSURE AND MISCELLANEOUS ACTIONS

An area of 1.5 ha will be fenced off with cattle nets to prevent cattle passing through. Within the area there is a pond and several stony areas of interest. Within the enclosure, several actions will be carried out as detailed below (see the following image). There will be 10 islands of scrub (in red on the image) with a total of 12 species, with 13 individuals of each, together making a total of 156 plants per island.

The image shows the detail of MEASURE 1:



From each species, 13 units will be placed on each island, making a total of 130 units per species, 156 total plants on each island and a total of 1560 plants in the total scrub islands.

Within the fenced area, ditches or infiltration lines (in yellow) will also be created following the contour lines, creating spaces in the ground to retain more water and improve infiltration. In total, they will be 200 metres long and will be filled with plant debris from the area to prevent erosion. To protect the areas where the water flows (black and white lines in the image), they will be surrounded by gabions, which will be made with stones from the area, by hand, and will be surrounded by a planting of 20 units of the species on the base. A stone will be placed inside the pond to encourage the presence of aquatic fauna and finally 501 plants will be replanted inside the fence.

Finally, shelters for birds, bats and insects will be placed in the surrounding area.

MEASURE 2. MEASURES ON THE GLEN "CAÑADA"

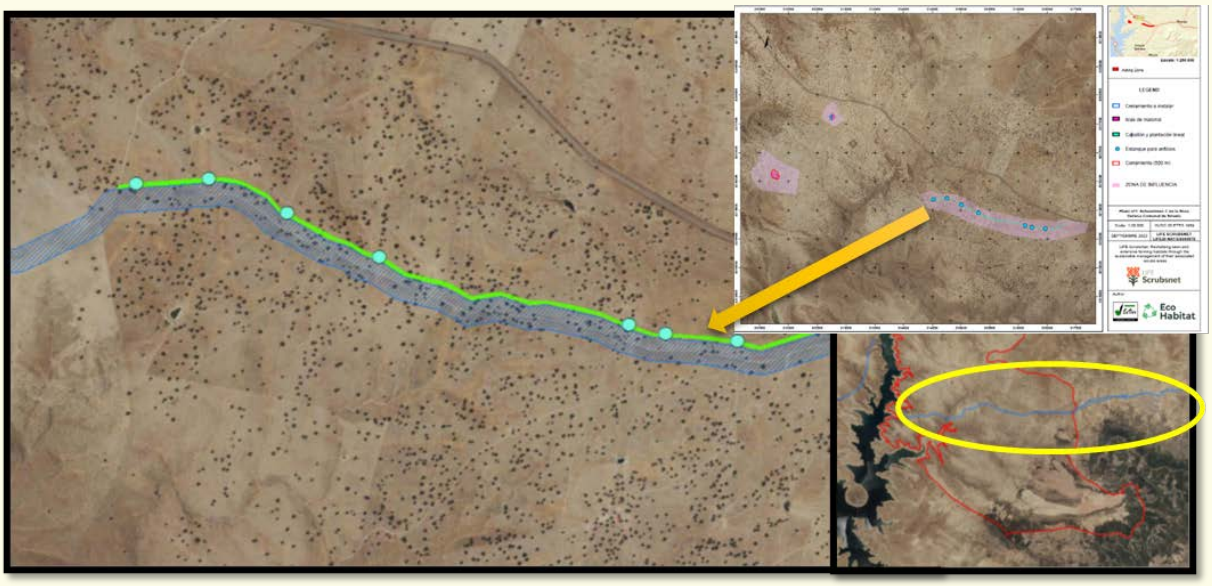
Action will be taken on the glen *Cañada Real de Merinas,* which is currently occupied by various agricultural uses that the municipality intends to alter in line with the environmental aims of the Project. The ultimate aim of the measures will be to encourage the presence of scrub on the banks, which will act as a natural barrier to herbivores and prevent these cattle-grazing areas from being occupied for other purposes, to which end work will be carried out on 2000 linear metres.

On the one hand, a discontinuous ridge will be created (see image below, green line) in order to make grazing more difficult. A shrub hedge will be created on this ridge, for which 355 encapsulated acorns will be planted for protection, 355 unprotected acorns and a line of 1112 plants in total belonging to 2 species (556 of each species): *Retama sphaerocarpa* and *Lavandula stoechas*.

Seven small temporary ponds for amphibians and reptiles will also be created along *the Cañada* (blue circles in the picture), taking advantage of the natural flood areas.

Finally, five rock structures, similar to those in the enclosure, measuring 1.5 x 1.5 metres and 0.5 metres high, will be built near the ravine. Here too, 10 plants will be planted per structure, for a total of 50 plants.

The image shows the detail of MEASURE 2:



MEASURE 3. POND RENATURATION

In this measure, work will be carried out at another existing pond, different from the previous one, renaturalising it and rehabilitating the perimeter with vegetation. A 250 metre perimeter fence (see image, black line) will be erected to prevent cattle access, taking advantage of a slope and the drainage on one side of the pond. Within this fenced area, various planting will take place. Fifty encapsulated acorns, previously collected from the farm itself, will be planted. There will also be a planting of 100 individuals in the first line on the banks of the pond, and another 100 individuals in the second line.

To finish off the work at the pond, 6 islands of shrubs (red circles in the picture) will be planted, each with a perimeter fence.

All the plantations will undergo regular maintenance and monitoring to ensure their success.

The image shows the detail of ACTION 3:

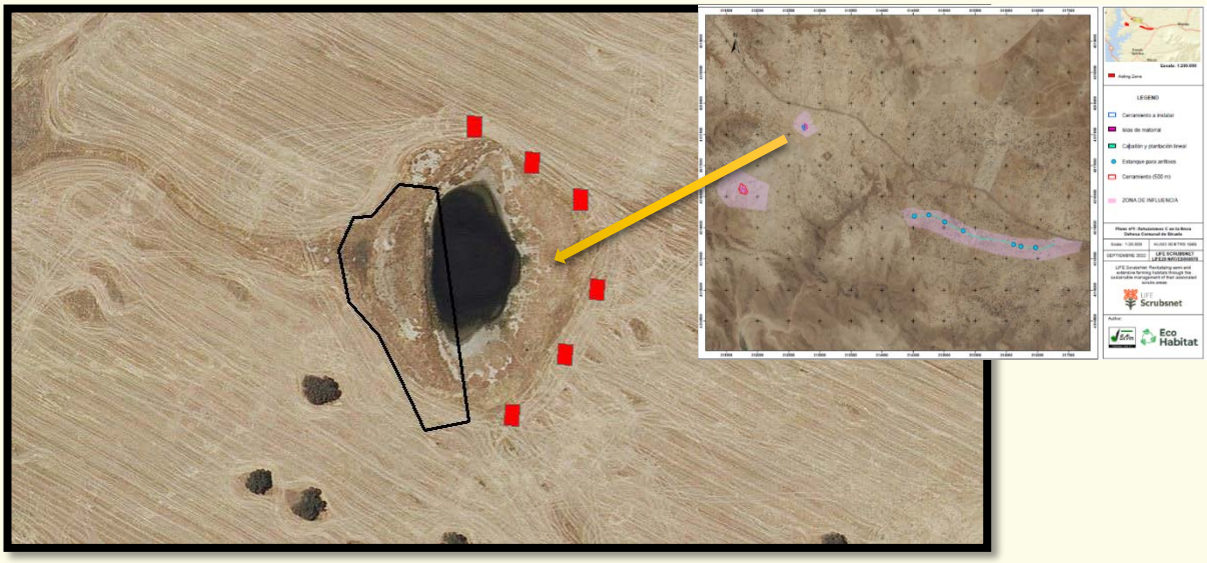


TABLE 1. SHRUB SPECIES USED

MEASURE 1. ENCLOSURE AND MISCELLANEOUS ACTIONS	
Scrub islands	***Cistus salvifolius***
	Cistus monspeliensis
	Cistus crispus
	Thymus vulgaris
	Salvia romarinus
	Teucrium fruticans
	Genista hirsuta
	Cytisus scoparius
	Retama sphaerocarpa
	Arbutus unedo
	Phyllirea angustifolia
	Myrtus comunis
Revegetation inside the fencing	***C. pseudocyperus***
	E. palustris
	C. longus
	S. holoschoenus
	I. pseudacorus
	M. aquatica
	M. pulegium
	P. tuberosa
	N. oleander
	F. tinctoria
	R. canina
	y Juncus spp
MEASURE 2. MEASURES ON THE GLEN	
Shrub hedge	***Retama sphaerocarpa***
	Lavandula stoechas
Rock structures	***Salvia spp***
	Retama sphaerocarpa
	Lavandula stoechas
	Quercus ilex

TABLE 1. SHRUB SPECIES USED. Cont.

MEASURE 3. POND RENATURATION	
Fencing	***C. pseudocyperus***
	E. palustris
	C. longus
	I. pseudacorus
	S.holoschoenus
	M. aquatica
	M. pulegium
	P. tuberosa
	N. oleander
	F. tinctoria
	R. canina
Scrub islands	***Cistus salvifolius***
	Cistus monspeliensis
	Cistus crispus
	Thymus vulgaris
	Salvia romarinus
	Teucrium fruticans
	Genista hirsuta
	Cytisus scoparius
	Retama sphaerocarpa
	Arbutus unedo,
	Phyllirea angustifolia
	Myrtus comunis

LIFE Scrubsnet

Revitalizing semi-arid extensive farming habitats through the sustainable management of their associated scrubs areas

Life programme
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