LIFE UNCINATA*

D6.2
Technical Description of Browsing Mitigation Tasks

Project Acronym: UNCINATA

Project name: Restoration, conservation, and resilience of Mediterranean pine forests (*Pinus uncinata*) on Pyrenees limestones

Call ID: LIFE21-SAP-NAT-ES-LIFE UNCINATA

Work Package: WP6

Task Number: T6.2

Lead beneficiary: Forest Science and Technology Centre of Catalonia (CTFC)

Contributing beneficiary(ies): -

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Co-funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No LIFE21-NAT-ES-LIFE-UNCINATA/101074730

NATURA 2000

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Main Considerations for Implementing Browsing Action Tasks

1 Introduction

The LIFE UNCINATA project aims to protect and restore the mountain pine (*Pinus uncinata*) forests of the Pyrenees, with a specific focus on the priority Habitat of Community Interest (HCI) 9430* (Montane and subalpine *Pinus uncinata* forests on gypsum or calcareous substrates).

In the Pyrennes, the habitat is located in the altimontane-subalpine belts (1,500 m – 2,500 m a.s.l., typically above 1,700 m a.s.l.). In general, the forest is characterized by a moderate density of pine trees, with a sparce shrub layer (mainly *Juniperus communis*) and a dominant herbaceous layer composed of species such as *Pulsatilla alpina, Sesleria coerulea subsp. calcarea and Festuca gautieri.* The target habitat borders subalpine grasslands and shrublands; consequently, many herbaceous species characteristics of subalpine grasslands are also common in the pine forest. The habitat often forms a transitional zone between forest and pasture, with a high presence of both domestic and wild ungulates.

The primary land-uses in these subalpine territories are forestry and livestock raising. Traditionally these areas have been used for seasonal grazing, by both of cattle and sheep, activities that remain important for the local economy. Although the habitat can tolerate moderate herbivory pressure, excessive browsing can hinder natural regeneration and degrade the understory plant community.

2 Objectives

Task 6.2. aims to reduce and mitigate the impact of domestic or wild ungulates on sensitive or heavily affected areas of the *Pinus uncinata* priority Habitat. A combination of browsing mitigation measures (sub-tasks) is proposed and justified to reduce herbivory pressure and enhance habitat regeneration in affected areas:

- T6.2.1: Restore encroached grasslands adjacent to overgrazed habitats stands (100 ha)
- T6.2.2: Redistributing livestock pressure away from sensitive or highly grazed areas by fencing selected mature or heavily browsed stands against livestock (80 ha)
- T6.2.3: Install fencing around small plots to reduce browsing pressure from wild ungulates (3,2 ha)
- T6.2.4: Plant key habitat species within fenced plots (8.500 seedlings)

The objective of the deliverable 6.2 is to define the technical prescriptions to implement these mitigation measures. The CTFC promotes the implementation of the actions described in this document by virtue of the agreements signed between the research institution and the public administrations holding ownership of the public or private forests, whether municipalities, EMDs (decentralised municipal entities), or the Government of Catalonia. The proposed actions have been presented to the technical management services of the respective EIN and ENPE (SAC) areas, as well as to the public forest services of the Directorate General for Forests and Environmental Management, and to the relevant territorial sections and district offices.

3 Selection of the sites

The identification of areas is considered a collaborative process involving forest managers, protected natural area managers, livestock farmers, and landowners. The analysis of aerial imagery and land-use maps will be combined with field assessment to identify restoration areas.

Before the selection, a thorough assessment of the target stand must be carried out to document the current state of degradation and establish baseline conditions for subsequent monitoring. This assessment should quantify the density of *Pinus uncinata* seedlings and saplings, the browse line height, and the composition and cover of the understory. The assessment should also identify the main livestock species present (cattle, sheep, horses) and the seasonal patterns of their use, as these factors directly determine the required fence specifications (linked to T6.2.2).

Twenty-five different treatment zones were identified in collaboration with forest managers during the identification phase. The selection process considers several criteria, including the expected positive effects of the mitigation treatments, technical feasibility, practical functionality of the restoration, cost-effectiveness, land ownership type and the potential for engaging forest owners and farmers. Based on this assessment, six sites were selected:

- Les Carboneres (SAC ES00000018)
- Serrat d'Escobairó (SAC ES00000018)
- Ras de la Coma (SAC ES00000018)
- Serrat del Forats (SAC ES5130003)
- Collet de la Bacanella (SAC ES00000018)
- Coll de Midós (SAC ES5120026)
- Boumort (SAC ES5130010)

4 Diagnosis

4.1 Les Carboneres

4.1.1 Location

The treatment area (Figure 1) is located on the northern slope of the Serra del Cadí, it extends between the villages of Urús and Bagà, on the mountainside above the Cadí tunnel. The treatment area is situated at an average elevation of approximately 1.500 m a. s. l.

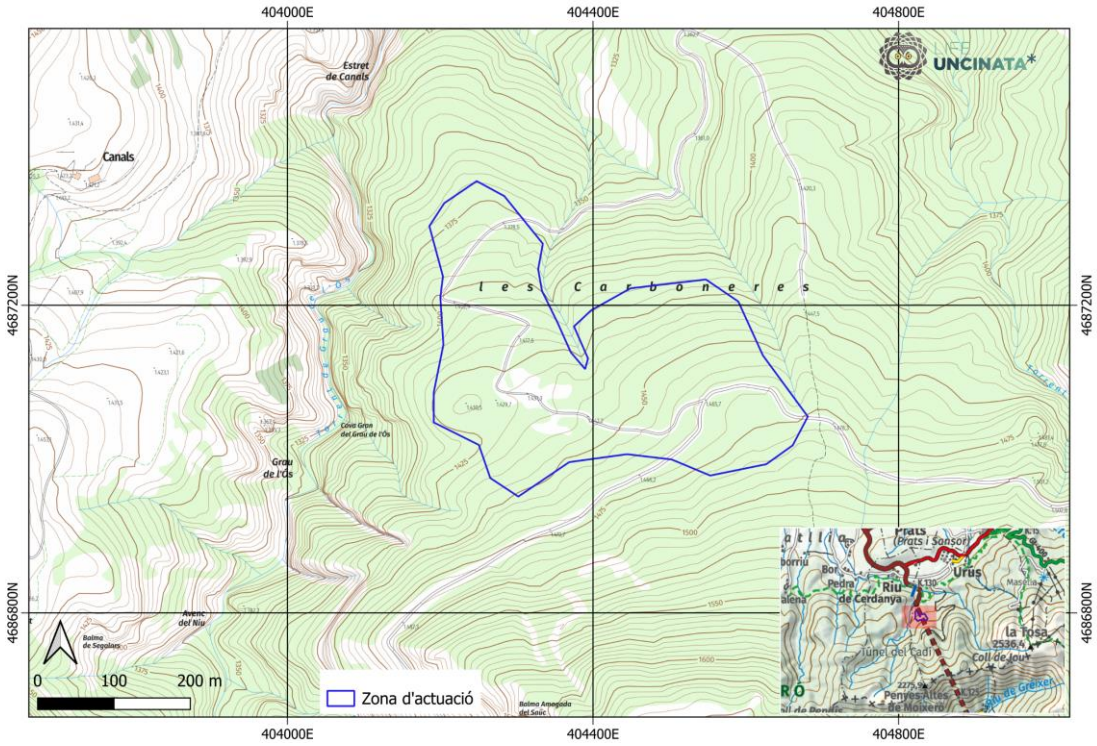


Figure 1. Les Carboneres area of pastures recovery (Urús)

4.1.2 Legal and administrative status

The selected intervention area belongs to the public forest owned by the municipality of Urús. It is located within the Natura 2000 Special Area of Conservation (SAC) ES0000018, “Prepirineu Central Català”, within the Cadí-Moixeró Natural Park. The property is registered under cadastral reference 17220A00200222Z.

The proposed treatments are consistent with the objectives and guidelines established in the Regional Forest Resources Management Plan (IOF)

Table 1. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Les Carboneres	11 ha	Urús Municipal Council	YES

4.1.3 Stand characterization

Dense forest dominated by *Pinus sylvestris*. This unit consists of a Scots pine (Pinus sylvestris) stand on gentle slopes (<30°), established through natural colonisation over the last 50 years (Figure 2), replacing former semi-natural dry grasslands (Festuco-Brometea).

The habitat is characterised by high tree density, strong competition for light and resources, and limited understorey development due to canopy closure. Natural regeneration is restricted, and structural diversity is relatively low. The stand is in a self-thinning phase, showing progressive canopy closure and increasing homogeneity.

The unit is besides a mountain pine forest *(Pinus uncinata)*, where the mitigation impact after the treatment will be quantified.

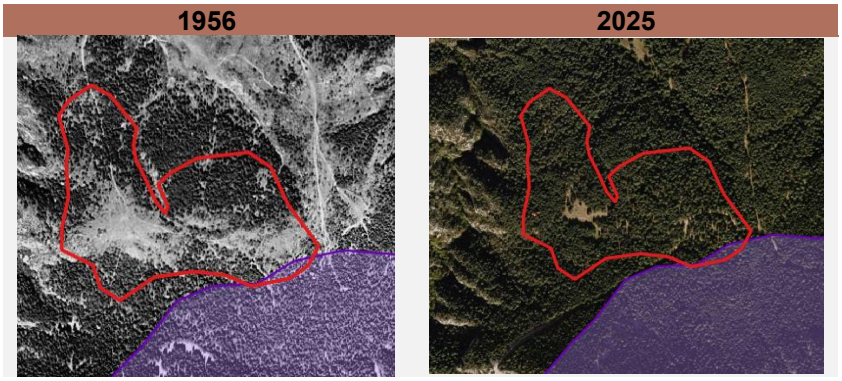


Figure 2. Historic ortoimage of Les Carboneres.

The area also partially overlaps with an Area of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie (Tetrao urogallus).

4.2 Serrat d'Escobairó

4.2.1 Location

The treatment area belongs to the municipality of Alp, in Cerdanya county. It is located in the Cadí-Moixeró Natural Park, in the network Natura2000 Special Area of Conservation (SAC) ES0000018, "Prepirineu Central Català".

The selected area covers approximately 4 hectares and is known locally as Serrat d'Escobairó at about 1,650 m a.s.l.

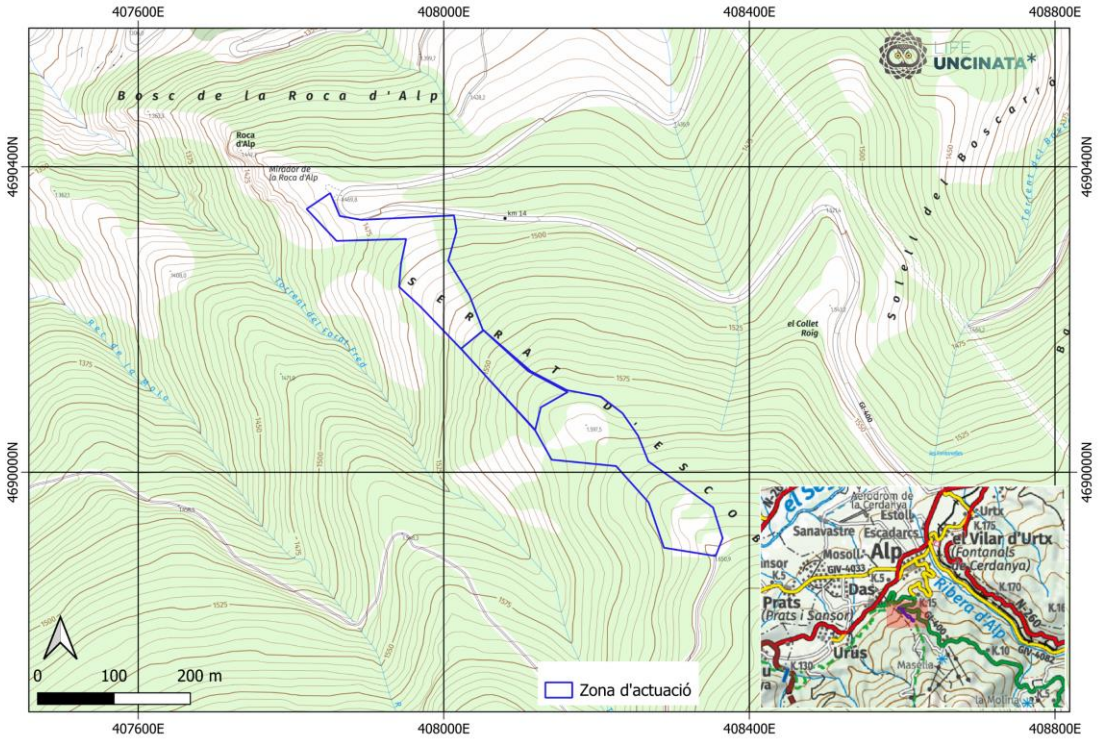


Figure 3. Treatment Unit in Serrat d'Escobairó (Alp).

4.2.2 Legal and administrative status

The selected intervention area is registered under cadastral reference 17006A007001940000ZX. It belongs to the municipality of Alp. The intervention is included in the Forest Harvesting Plan of Alp, issued by Directorate General of Forest Ecosystems and Environmental Management of the Generalitat de Catalunya.

Table 2. Basic data of the intervention as described in the Forest Harvesting Plan.

Sur. (ha)	Action
4	Restoring two pasture areas (marked in white on the topographic map) through clearing and thinning of the forest patches they contain. In the area marked in green, which corresponds to a dense forest with high cover of boxwood (*Buxus sempervirens*), a light thinning with shrub clearing and shredding of residues is proposed, without significantly opening the canopy in this intervention.

Table 3. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Serrat d'Escobairó	4	Municipality of Alp	YES

The area hosts habitats of community interest, notably the priority habitat 9430* — Black pine (*Pinus uncinata*) calcareous forests and the habitat 5110, Stable xerothermophilous formations with Buxus sempervirens on rocky slopes.

4.2.3 Stand characterization

Scots pine (*Pinus sylvestris*) forest and calcareous shrubland with scattered trees. The area contains two meadow patches connected by a belt of pine forest. These meadows have been progressively colonised by juniper (*Juniperus communis*), broom (*Cytisus scoparius)*, boxwood (*Buxus sempervirens*), among other shrub species. The pine stand presents a crown cover (FCC) of approximately 85%, with an understory dominated by juniper and boxwood. Skid trails provide access by tractor from the road to both the treatment and timber extraction areas.

The restored herbaceous habitat corresponds predominantly to a xeric calcareous grassland, dominated by tussock-forming grasses and other species characteristic of calcareous affinity (HIC 6210*). Notable species include *Agrostis capillaris, Festuca ovina, Dichanthium ischaemum*, and *Brachypodium retusum*, which form the structural basis of the herbaceous community.

4.3 Ras de la Coma

4.3.1 Location

The treatment area is in the municipality of Bellver de Cerdanya, within the region of Cerdanya. The site, known locally as Ras de la Coma, is situated on the northern slopes of the Serra del Cadí at an elevation of 1800 m.

It is located within the Natura 2000 Special Area of Conservation (SAC) ES0000018, "Prepirineu Central Català", within the Cadí-Moixeró Natural Park.

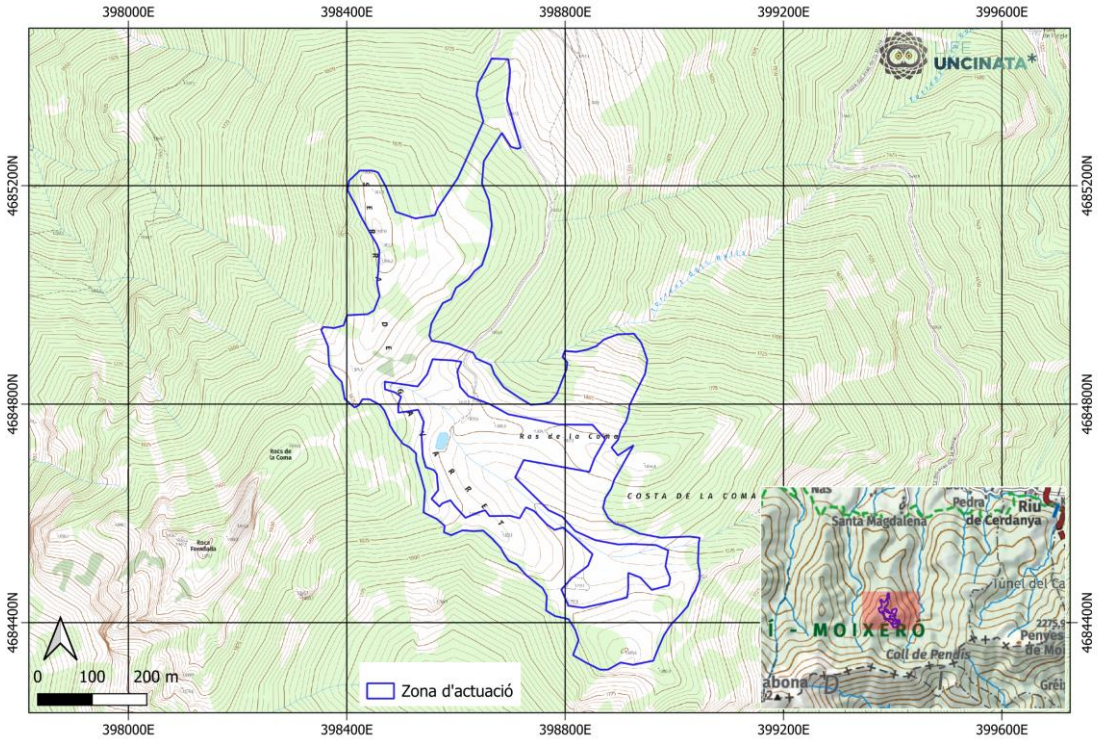


Figure 4 Treatment Unit in Ras de la Coma (Bellver de la Cerdanya).

4.3.2 Legal and administrative status

The selected intervention area belongs to the public forest, owned by the municipality of Bellver de la Cerdanya. The area is registered under cadastral reference 25060A003005290000PL. The intervention is included in the Forest Harvest Management Plan, drafted by the Directorate General of Forest Ecosystems and Environmental Management of the Generalitat de Catalunya.

Table 4. Basic data of the intervention as described in the Forest Harvesting Plan.

Sur. (ha)	Action
20,0	Maintenance of an open grazing area, through opening the canopy in the transition zones with a shrub clearing and shredding of residues.

Table 5. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Ras de la Coma	20,0	Bellver de la Cerdanya Council	In progress

4.3.3 Stand characterization

The forest formation corresponds to a mixture of native conifers with a uniform distribution and a structure mainly in the polewood stage.

The dominant species is mountain pine (*Pinus uncinata*), which accounts for approximately 50% of the stand composition, in a polewood developmental stage with a relatively mature associated structure. The secondary species is Scots pine (*Pinus sylvestris*), representing around 30% of the composition, also in a polewood stage. No data are available for a third tree species.

The herbaceous layer corresponds largely to a mesophilous calcareous grassland developed on calcareous soils, generally shallow but with sufficient water retention capacity to maintain intermediate (mesic) conditions. It is in a transition zone between forested areas and open spaces, forming a dense, continuous and relatively stable herbaceous community. Floristically, it is dominated by tussock-forming grasses such as *Festuca nigrescens*, along with calcicolous species such as *Plantago media, Galium verum* and *Cirsium acaule*, among others (HIC 6210*). The presence of these species indicates basic, moderately fertile soils with a long-standing dynamic traditionally linked to extensive grazing.

The second habitat present in Ras de la Coma consists of a siliceous mesophilous grassland of the montane and subalpine belts of the Pyrenees (HIC 6230*). These grasslands develop on siliceous or leached substrates with moderate fertility. They are characterised by the presence of grasses such as *Nardus stricta, Agrostis capillaris, Festuca nigrescens and Anthoxanthum odoratum*, which form the structural basis of the herbaceous community.

Both herbaceous formations are in good conservation status and depend on a regime of moderate disturbance, mainly through extensive grazing. Ecologically, they are characterised by high floristic diversity, high pastoral value, an important role as an ecological transition between forest and shrubland, and a certain vulnerability both to abandonment (which promotes shrub encroachment and forest regeneration) and to overgrazing.

The area also overlaps with several Areas of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie (*Tetrao urogallus*) and the Bearded vulture (*Gypaetus barbatus*).

4.4 Serrat del Forats

4.4.1 Location

The treatment area is in the municipality of Soriguera. It’s located on predominantly south-west-facing slopes, at elevations of approximately 1.700 m above sea level.

The treatment area is located within the Parc Natural de l'Alt Pirineu and the Natura 2000 Special Area of Conservation (SAC) ES5130003 “Alt Pallars”.

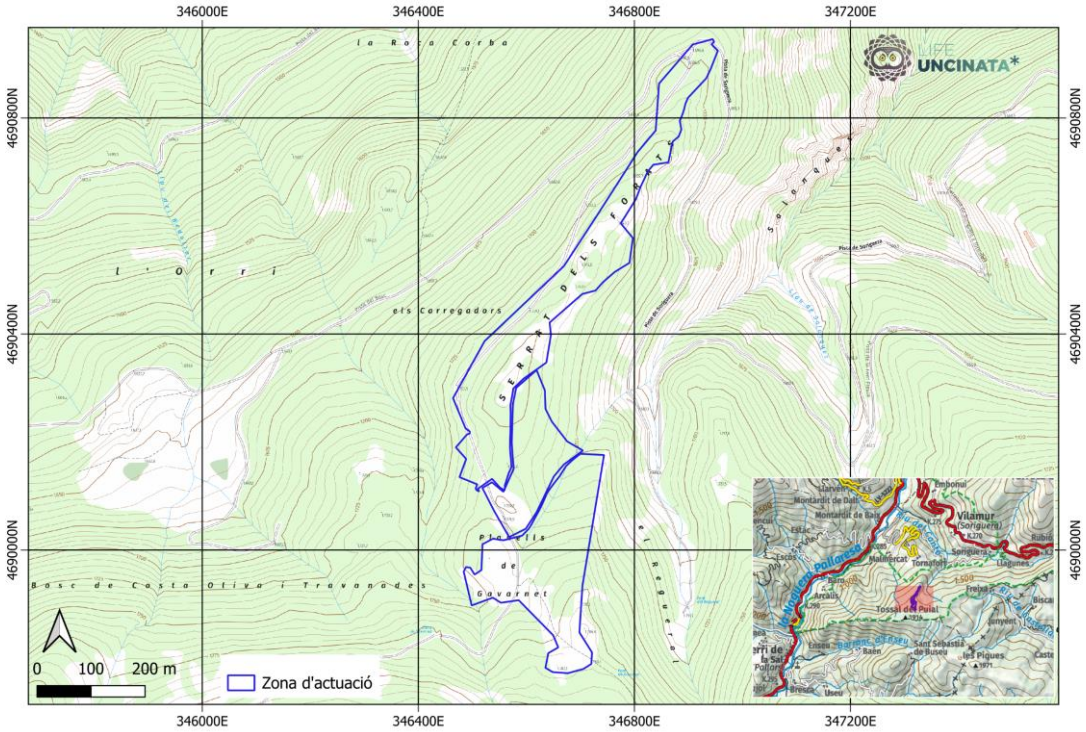


Figure 5 Treatment unit in Serrat dels Forats (Tornafort).

4.4.2 Legal and administrative status

The selected intervention area belongs to the public forest owned by the Decentralised Municipal Entity (EMD) of Tornafort. The property is registered under cadastral reference 25259A00301134. The proposed intervention has been reviewed in consultation with the county forest engineer and is consistent with the current Forest Resources Management Plan (POF).

Table 6. Basic data of the intervention as described in the Forest Resources Management Plan.

Sur. (ha)	Action
14	A thinning operation is planned to improve pasture production by opening the forest stand and increasing pasture productivity in both the short and long term.

Table 7. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Serrat dels Forats	14,0	EMD of Tornafort	YES

4.4.3 Stand characterization

The treatment unit is located on calcareous rocky terrain adjacent to a forest track and forms part of a forest–pasture mosaic that has undergone progressive natural afforestation following the decline of traditional shepherd-guide grazing. Former open grasslands are now partially occupied by young stands of mountain pine (*Pinus uncinata*) and dense stands of Scots pine (*Pinus sylvestris*), with canopy cover ranging from 70 to 85% according to the Spanish Forest Map (MFE). The understory is dominated by common juniper (*Juniperus communis*), boxwood (*Buxus sempervirens*), and Scotch broom (*Cytisus scoparius*), which limit livestock movement and reduce the effective grazing area.

Ecologically, the site is of high conservation value as a transitional habitat between the Eurosiberian and Mediterranean biogeographical regions, supporting diverse plant and animal communities. The area also overlaps with several Areas of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie (*Tetrao urogallus*) and the Bearded vulture (*Gypaetus barbatus*), as well as an area of regular presence of the Griffon vulture (*Gyps fulvus*).

4.5 Coll de Bacanella

4.5.1 Location

The treatment area is in the municipality of La Vansa i Fórnols. The Coll de la Bacanella has a roughly northeast–southwest orientation, connecting the Vall de la Vansa on the northeast side with the lower Pre-Pyrenean valleys toward the southwest.

The treatment area is located within the Parc Natural de Cadí-Moixeró and the Natura 2000 Special Area of Conservation (SAC) ES0000018, “Prepirineu Central Català”.

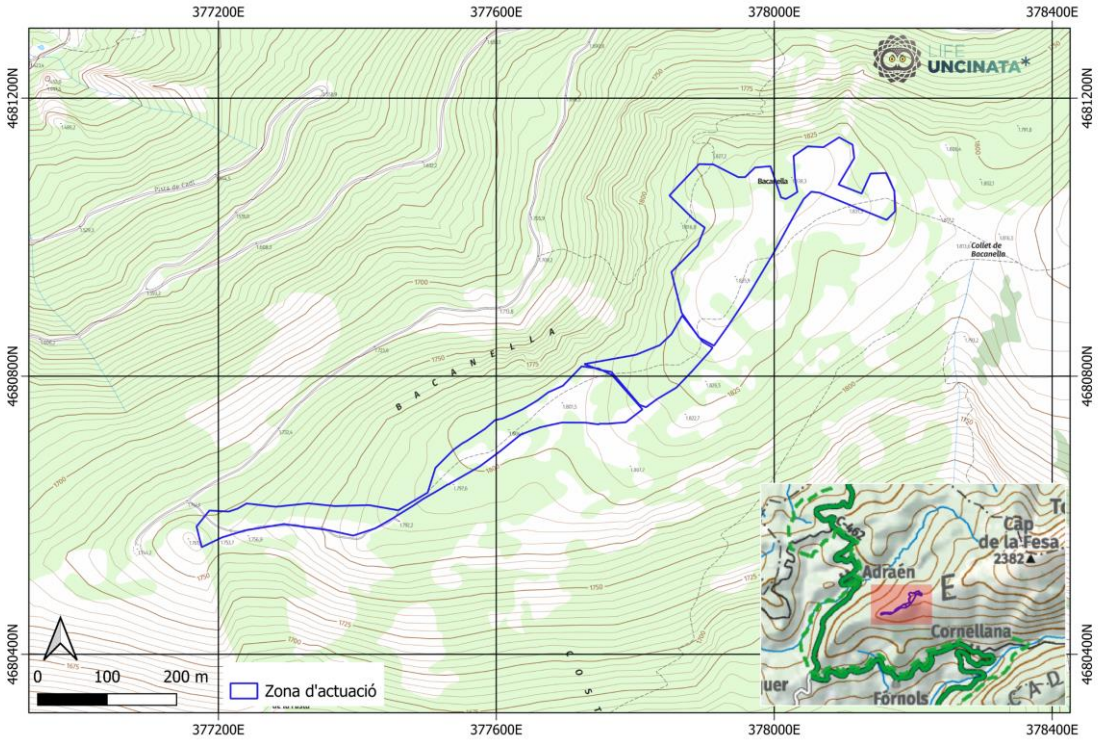


Figure 6. Treatment Unit in Coll de Bacanella.

4.5.2 Legal and administrative status

The selected intervention area belongs to the public forest owned by the municipality of la Vansa i Fórnols. The property is registered under cadastral reference 25302A01100182. The proposed intervention has been reviewed in consultation with the county forest engineer.

Table 8. Basic data of the intervention as described in the Forest Resources Management Plan.

Sur. (ha)	Action
7,1	A thinning operation is planned to improve pasture production by opening up the forest stand and increasing pasture productivity in both the short and long term.

Table 9. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Coll de la Bacanella	7,1	Municipality of La Vansa I Fórnols	NO

4.5.3 Stand characterization

The proposed area is predominantly located within a forest stand classified as woodland, with a high tree cover (60–90%). The formation is mainly dominated by Scots pine (*Pinus sylvestris*), with occasional presence of mountain pine (*Pinus uncinata*), arranged in a relatively regular structure and corresponding to a mature pole-stage to small timber stage (fustal development). The understory shows a variable shrub layer, with species such as boxwood (*Buxus sempervirens*) and scattered thorny scrub forming shrubland margins and ecotonal transitions.

In a more fragmented pattern, small patches of grassland are also present, with shrub cover ranging between 30% and 60%. These correspond to semi-natural meso-European calcareous grasslands belonging to the class *Festuco-Brometea*, occasionally with rocky outcrops.

A small area within the lower part of the slope, closer to the track, corresponds to the habitat type HIC 5110 – Permanent thermophilous boxwood formations on rocky slopes (*Buxus sempervirens* formations), covering approximately 0.45 ha.

The area also overlaps with several Areas of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie (*Tetrao urogallus*) and the Bearded vulture (*Gypaetus barbatus*).

4.6 Coll de Midós

4.6.1 Location

The treatment area is located on the territory of Bescaran (municipality of Les Valls de Valira, Alt Urgell), in the central sector of the Catalan Pyrenees, in a Natura 2000 Special Area of Conservation (SAC) ES5120026, Tossa Plana de Lles - Puigpedrós. It lies in a mid-mountain environment situated at an approximate elevation of around 1,900–2,000 meters above sea level.

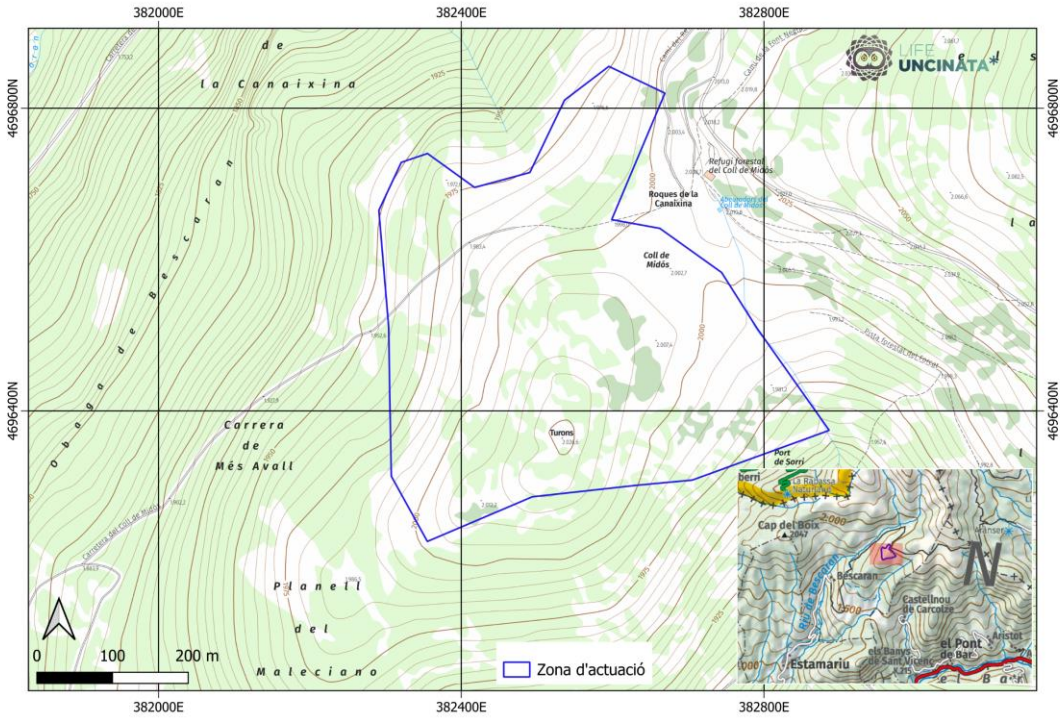


Figure 7. Treatment Unit in Coll de Midós (Bescaran).

4.6.2 Legal and administrative status

The selected intervention area belongs to the public forest owned by the village of Bescaran, at the region of Alt Urgell. The property is registered under cadastral reference 25026A01700234. The proposed intervention has been revised by the county forest engineer.

Table 10. Basic data of the intervention as described in the Proposal.

Sur. (ha)	Action
21,2	A selective thinning operation is planned to improve pasture production by opening up the forest stand and a shrub clearing is proposed to improve pasture productivity and to revert the process of forest colonization.

Table 11. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Coll de Midós	21,2	Municipality of Bescaran	NO

4.6.3 Stand characterization

Pasture area with a mixed tree canopy of *Pinus uncinata* and *Pinus sylvestris*, with a current canopy cover (FCC) of 50% and a shrub layer dominated by *Juniperus communis,* with an approximate cover of 20%, according to the Spanish Forest Map (MFE).

The area supports a high grazing load and contains abundant herbaceous species indicative of overgrazing, reflecting substantial livestock pressure. Despite this, the pasture openings act as nuclei for natural regeneration, contributing to the progressive closure of the open landscape. This process is clear when compared with aerial photographs from 1990, when tree cover was approximately 20%, considerably lower than at present. This trend reveals a sustained process of forest densification and a gradual reduction in the area of pasture available for grazing.

The area also overlaps with several Areas of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie (*Tetrao urogallus*) and the Golden eagle (*Aquila chrysaetos*).

4.7 Boumort

4.7.1 Location

The treatment area is located on the Hunting National Reserve of Boumort (Figura 8), in the Natura 2000 Special Area of Conservation (SAC) ES130010, Serra de Boumort-Collegats.

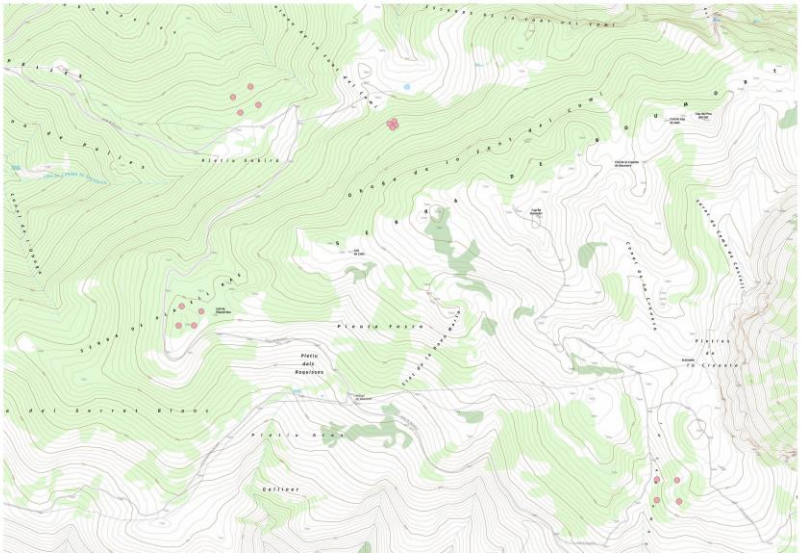


Figure 8. Treatment Unit in Hunting National Reserve of Bourmort. Red dots correspond to the corners of the four fenced plots.

4.7.1 Legal and administrative status

The Boumort National Hunting Reserve (RNC) belongs to the Generalitat de Catalunya and was created by Law 17/1991 approved by the Parliament of Catalonia on 23 October 1991, with the aim of protecting, promoting and exploiting the animal species that live there in the wild and preserving the ecosystems to which they belong.

Table 12. Basic data of the intervention as described in the Proposal.

Sur. (ha)	Action
3,2	Install fencing around small plots to reduce browsing pressure from wild ungulates. Four diferent locations.

Table 13. Property information

Name of the property	Approximate surface (ha)	Ownership	IOF
Boumort	32	Generalitat de Catalunya- DARP	NO

4.7.2 Stand characterization

High to moderate pine density stands with very low density of woody understory, mostly *Juniperus communis*; *Lonicera* spp. is also present. Previous monitoring of the browsing pressure indicates a very high level of browsing in the understory shrubs and pine seedlings, with a high number of wild ungulate tracks and excreta drops.

The area also overlaps with several Areas of Faunistic and Floristic Interest (AIFF), including critical habitat for the Western capercaillie *(Tetrao urogallus)* and the Cinereous vulture *(Aegypius monachus*).

5 Treatment design

Table 14. Description of the treatment in each Treatment Unit.

Location	Sur. (ha)	Description
Les Carboneres	11	Encroaching forest of *Pinus sylvestris* with associated grassland species (Festuco-Brometea). 50-year-old forest from colonization, with nearly closed canopy. • **Intensive clearing:** Promote by the council for wood production. • **Mechanical mulching of remains:** Woody remains cut into pieces for restoring the pastoral use.
Serrat d'Escobairó	4	Two grazing areas encroached by shrubs, connected by a forest dominated by *Pinus sylvestris*, with an initial cover of approximately 85%. Area suitable for mechanisation. • **Shrub clearing:** Open grassland patches undergoing shrub encroachment • **Intensive clearing:** Grassland patches. Results of 20- 30 % of canopy cover. • **Light clearing:** In the forested zone of connection, clear up to 50-60% of canopy cover resultant. • **Woody debris shredding:** Woody remains cut into pieces for restoring the pastoral use. • **Extraction of the timber obtained**, to the landing, using the method deemed most appropriate. • **Sorting and classification of the timber obtained** at the stacking or landing area.
Ras de la Coma	20	Wide culminal grassland encroched by shrubs, surrounded by Pinus uncinata and Pinus sylvestris. Differentiated treatments according to forest stand type (grassland areas, Scots pine stands, and mountain pine stands), adjusting intervention intensity to each ecological unit. • **Selective thinning** and tree opening through the removal of individual stems, while retaining trees of highest ecological value and target species, particularly Pinus uncinata in mountain pine stands**.** • **Shrub clearing (mechanical and manual)** to reduce shrub cover and improve the continuity of open areas. • **Creation of a transitional structure,** maintaining shrub patches as wildlife refuges and transitional zones between forest and grassland. • **Management of silvicultural** residues through shredding and controlled redistribution to avoid accumulation over pasture areas. • **Formation of linear barriers** of shredded woody material along the forest–pasture interface, acting as livestock boundaries and reducing browsing pressure. • **Extraction of the timber obtained**, to the landing, using the method deemed most appropriate. • **Sorting and classification of the timber obtained** at the stacking or landing area. • **Fencing specific mature or highly browsed stands**

Serrat dels Forats	14	Dense forest dominated by *Pinus sylvestris and Buxus sempervirens.* Variable initial canopy cover (CC), with an average of approximately 80%. Includes: • **Shrub clearing:** Open grassland patches undergoing shrub encroachment • **Improvement thinning** of moderate intensity and heterogeneous spatial distribution, aimed at reducing tree cover to 30-40% in the pine area. • **Selective clearing of shrubs and localised pruning** of live branches on trees generating obstacles to animal transit, below 3 m in height in the boxwood shrubland. • **Treatment of silvicultural slash** using mechanical methods wherever possible. • **Extraction of the timber obtained**, to the stacking or loading area, using the method deemed most appropriate. • **Sorting and classification of the timber obtained** at the landing or loading area. • **Fencing specific mature or highly browsed stands**
Coll de Bacanella	7	Dense forest dominated by *Pinus sylvestris*. Variable initial canopy cover (CC), ranging between 50 and 80%. Abundant and variable understory, with an initial cover ranging between 20% and 70%. Includes: • **Shrub clearing** to reduce shrub cover and improve the maintenance of open areas. • **Selective thinning** to create an open silvopastoral woodland structure. Reduction of tree cover to 30-40% in transition zones. Shrub clearing to 30% cover. Preservation of fruit-bearing species and “Habitat Trees”. • **Extraction of the timber obtained**, to the stacking or loading area, using the method deemed most appropriate. • **Woody debris shredding** • **Sorting and classification of the timber obtained** at the landing or loading area.
Coll de Midós	21,2	Open forest dominated by *Pinus uncinata*, with a silvopastoral woodland structure encroached by shrubs and conifer regeneration. Includes: • **Shrub clearing** to reduce shrub cover and improve the maintenance of open areas. • **Selective thinning** to create an open silvopastoral woodland structure (Max CC resultant between 30% and 40%) • **Extraction of the timber obtained**, to the stacking or loading area, using the method deemed most appropriate. • **Sorting and classification of the timber obtained** at the landing or loading area.
Boumort-Tornafort	3,2	**Ungulate exclusion and understory plant restoration** in *Pinus uncinata* habitat areas with heavy browsing impacts on understory woody species and pine regenerated individuals • **Fencing** to reduce browsing of wild ungulates and increase the vitality of key understory plant species and pine seedlings in three pilot areas • **Planting key habitat species** to reinforce the understory composition with a potential to provide fruits for the fauna.

6 Description of the proposed actions

6.1 Treatment Technical Description

6.1.1 Improvement thinning

Improvement thinning in Scots pine (*Pinus sylvestris*) stands is ecologically justified where the objective is to enhance tree growth, maintain moderate canopy cover, and promote a structurally diverse understory of high value for wildlife.

The treatment reduces stand density to increase radial growth and crown development of the retained individuals, while maintaining an overall canopy cover of approximately 50%. The treatment removes suppressed, poorly formed or competing trees, and open patches that supports both pasture recovery and biodiversity conservation. The treatment can also favour fruit-producing shrubs such as bilberry (*Vaccinium myrtillus*), bearberry (*Arctostaphylos uva-ursi*), raspberry (*Rubus idaeus*), rowan (*Sorbus aucuparia*), and juniper (*Juniperus communis*). Dense shrub patches with cover values of 50–70% and heights between 30 and 80 cm may be intentionally maintained to provide refuge and nesting habitat for wildlife, particularly the Western capercaillie (*Tetrao urogallus*).

6.1.2 Selective thinning

Selective thinning is a silvicultural treatment aimed at reducing stand density to create a more open woodland structure while retaining the most vigorous and ecologically valuable trees. The treatment involves the selective removal of individual trees to achieve a target canopy cover typically ranging between 30% and 40%, depending on site conditions and management objectives.

Particular attention is given to habitat trees with cavities or other microhabitats, and minority species of ecological interest such as silver fir (*Abies alba*) and native broadleaves (Table 15).

In the area to be converted into a wooded pasture, retain well-developed trees as perches and preserve senescent or dead trees. Trees bearing microhabitats (Habitat Trees) will not be felled. If pruning is carried out, it will not exceed 3 m above ground level. Trees located close to the forest track will be removed as whole stems; branches will be chipped on the track and the logs subsequently extracted. In areas farther from the track where extracting the entire tree is not advisable, branches will be arranged in criss-cross piles to promote the creation of wildlife refuges.

Residual shrub cover of approximately 30% is generally maintained, while species of ecological value, including fruit-producing shrubs such as *Rosa* spp. and *Sorbus* spp., are preserved as food resources and shelter for wildlife. In sensitive areas used by the Western capercaillie (*Tetrao*

urogallus), higher structural thresholds may be maintained, including canopy cover of up to 50% and a minimum shrub cover of 30%, in accordance with species-specific habitat requirements. In areas corresponding to Habitat Type 5110 – permanent thermophilous boxwood (*Buxus sempervirens*) formations on rocky slopes, the conservation of this habitat is prioritised and clearing operations will target other shrub species such as juniper (*Juniperus spp.*) and broom *(Genista spp.*), while preserving boxwood and other calcareous shrub communities.

Table 15. Characteristic species of HCI 9430 on calcareous substrates relevant to WP6.2 restoration actions.

Stratum	Species (EN)	Common Name	Ecological Role
Tree	*Pinus uncinata*	Mountain pine	Dominant tree, habitat-forming
Tree	*Abies alba*	European silver fir	Structural complexity, highly palatable to ungulates
Tree	*Sorbus aucuparia*	Rowan	Companion species
Tree	*Betula pubescens*	Downy birch	Companion (humid sites)
Shrub	*Arctostaphylos uva-ursi*	Bearberry	Key calcareous indicator
Shrub	*Juniperus communis* subsp. *alpina*	Mountain juniper	Calcareous indicator
Shrub	*Cotoneaster integerrimus*	Common cotoneaster	Calcareous indicator
Shrub	*Buxus sempervivens*	Boxwood	Calcareous indicator
Shrub	*Rhododendron ferrugineum*	Alpenrose	Dominant (acidic/leached microsites)
Shrub	*Vaccinium myrtillus*	Bilberry	Dominant (acidic microsites)
Herb	*Pulsatilla alpina* subsp. *fontqueri*	Alpine pasqueflower	Calcareous indicator
Herb	*Sesleria coerulea* subsp. *calcarea*	Blue moor-grass	Calcareous grassland indicator
Herb	*Festuca gautieri*	Gautier's fescue	Calcareous grassland indicator
Herb	*Valeriana montana*	Mountain valerian	Calcareous grassland species

6.1.3 Shrub cover management

Shrub cover targets vary according to the ecological function of each area, ranging from open pasture recovery to forest structural management and biodiversity conservation. As a general reference, a shrub cover of around 15% is applied in areas primarily managed for grassland restoration and pasture productivity, ensuring sufficient light availability for herbaceous development and it is must to retain shrub patches equivalent to 30% of the existing shrub cover, providing shelter for small rodents and a food resource for birds, particularly in areas near the forest edge or beneath scattered trees within the pasture.

In silvopastoral forest areas subjected to selective thinning, higher shrub cover values of approximately 30% are maintained. This configuration reduces fuel continuity and wildfire risk while preserving a functional woodland structure.

In specific zones, particularly those with ecological value or importance for wildlife, shrub patches are intentionally retained at higher cover levels (50–70%) and heights of 30–80 cm. These structures, often composed of berry-producing species, provide essential refuge habitat and support biodiversity, including species sensitive to predation.

Finally, in areas corresponding to thermophilous *Buxus sempervirens* formations (HIC 5110), calcicolous species and the ecological integrity of the habitat will be preserved. Management will avoid broad-scale shrub clearing and will instead rely on light, selective clearing through the creation of narrow corridors to maintain habitat continuity while improving accessibility and grazing use.

Table 16. Recommended clearing techniques for grassland restoration based on terrain characteristics.

Terrain condition	Recommended technique	Key considerations
Gentle slopes (<15°), accessible	Mechanical mulcher / brushcutter	Most cost-effective; avoids soil disturbance
Moderate slopes (15–30°), accessible	Chainsaw + brushcutter	Manual removal of cut material required
Steep slopes (>30°), limited access	Manual chainsaw cutting	Highest cost; essential for erosion prevention
Rocky outcrops / lapiaz	Manual cutting with hand tools	Avoid soil disturbance; protect calcareous flora

6.1.4 Creation of silvopastoral corridors through selective shrub clearing

Silvopastoral corridor creation consists of the selective clearing of shrubs and lower branches to establish linear openings within forest stands, improving connectivity between pasture areas and facilitating the movement of livestock and wildlife.

The treatment will preferably be carried out using mechanical means (hammer or chain mulcher mounted on a tractor, robot, or similar equipment). Where these means cannot be used, manual brushcutters will be employed.

6.1.5 Localised pruning

Live branches will be pruned from trees that generate vertical fuel continuity with the shrub layer, up to a maximum height of approximately 1.5 m on the stem. This pruning will be applied only to trees located in clearings or open areas where low live branches create continuity with the understory layer. Pruning will be executed using manual chainsaw

6.1.6 Woody debris shredding to promote pasture regeneration

The shredding of woody residues should be carried out using appropriate equipment such as brush cutters, mechanical brush mowers equipped with hammer, chain or blade systems, or tractor-mounted hydraulic brush arms. Woody material should be cut into sections of 1 to 1.5 m in length when the diameter exceeds 5 cm.

In all cases, it is recommended that the accumulation of residues on the ground does not exceed 0.5 m in height, in order to reduce fuel loads, facilitate decomposition processes, and promote the recovery of herbaceous vegetation.

Table 17. Summary of mulching specifications for pasture improvement

Parameter	Specification	Purpose
Max. Fragment Length	< 10 cm (for 90% of weight)	Accelerate decomposition & light entry
Max. Layer Thickness	< 10 cm	Prevent suppression of germination
Max. Accumulation Height	< 0.5 m	Fire safety & livestock mobility
Pre-processing Diameter	> 5 cm (cut to 1-1.5m)	Ensure effective machine processing
Execution Timing	Late August – November	Protect fauna & prepare for spring
Soil Condition	Dry or firm	Prevent compaction & N-immobilization

6.1.7 Extraction of timber obtained from thinning operations

The operation consists of extracting the timber generated by thinning operations to the stacking or loading point.

The stacking/loading site shall be located along the lower main forest road and will be defined during the works initiation meeting by the district forest engineer or the officer responsible for timber management.

The permitted means for timber extraction are as follows:

- Forestry tractor (adapted tractor or skidder) equipped with a cable winch. The cable used should preferably be a synthetic cable with a length > 30 m.
- Animal traction, using adequately equipped and trained equids, handled by personnel with appropriate training.

The permitted extraction methods are as follows:

- Log extraction (stem-only harvesting).
- Whole-tree extraction (whole tree harvesting). In this case, cutting slash will be generated at the landing and shall be managed in accordance with the principles described in Section 6.1.4 Treatment of woody slash generated by thinning operations.

6.1.8 Sorting and classification of timber obtained from thinning operations

The different timber products obtained shall be stacked in separate piles at the stacking or loading area.

The operation consists of identifying and separating the extracted logs (either whole or cut into sections) according to the type of timber product. Product classification aims to maximise the utilisation of the harvested wood and shall include, at a minimum, three product categories: chipping, sawlogs, and special products. The final number of product categories and their specific characteristics shall be defined during the works initiation meeting by the district forest engineer or the officer responsible for timber management.

Timber piles shall be constructed so that the first row of logs does not come into direct contact with the ground, using other logs (from the residual product class) as bearers.

6.1.9 Fencing specific mature or highly browsed stands against livestock

The installation of guiding fences to redirect livestock movement away from the most sensitive forest areas is proposed as a management measure aimed at reducing herbivory pressure on regenerating zones and vulnerable habitats, while maintaining the continuity of traditional grazing

practices. These fences will allow pastoral use to remain compatible with conservation objectives by channeling livestock movement towards less sensitive areas and preventing prolonged concentration within mature stands and naturally regenerating sites.

The placement of the fences should be strategically planned to maximize the protection of areas with the highest ecological value, while minimizing habitat fragmentation and disruption to traditional transhumance routes and local land-use dynamics. The protection of regeneration from excessive herbivory by domestic ungulates is explicitly identified as a conservation priority for HCI 9430*.

It is imperative to coordinate with local landowners and herders, as established under WP4, to ensure that alternative grazing areas are available and to foster social acceptance of the conservation measures. The duration of exclusion should be a minimum of 5 to 10 years to allow for significant understory recovery, after which adaptive management, including periodic controlled grazing, may be introduced to prevent excessive shrub dominance.

Livestock exclusion fences in subalpine environments must be robust enough to withstand harsh winter conditions while effectively deterring the target livestock species. The fence design must account for heavy snow loads; utilizing flexible materials or designing sections that can be temporarily lowered or removed during the winter months. Table 18 provides the key technical specifications for livestock exclusion fencing in the context of HCI 9430*. The effectiveness of the fences should be periodically evaluated.

Table 18. Technical specifications for livestock exclusion fencing in subalpine *Pinus uncinata* stands.

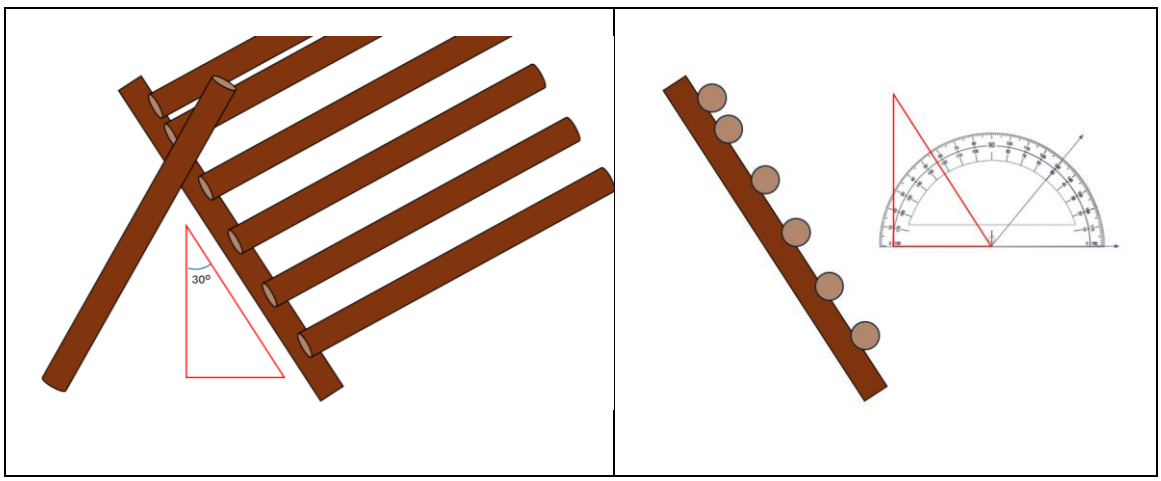
Parameter	Specification	Notes
Fence height	1.5–1.8 m (cattle); 1.2–1.5 m (sheep/goats)	Adjust to dominant livestock species
Wire type	Galvanized high-tensile wire (smooth or barbed) or woven wire mesh	Galvanized for corrosion resistance
Post material	Treated wood, steel T-posts, or fiberglass	Wood preferred for aesthetic integration
Intermediate post spacing	3–4 m	Reduce to 2–3 m on steep slopes
Line post spacing	8–10 m	With intermediate posts between
Bottom wire height	20–30 cm above ground (smooth wire)	Allows small mammal passage; reduces erosion
Gate dimensions	Minimum 3–4 m wide	At least 2 gates per enclosure

6.1.10 Fencing small plots to reduce browsing of wild ungulates

Wild ungulates can exert significant browsing pressure on *Pinus uncinata* seedlings and saplings, thereby hindering forest regeneration. Browsing can also impact on the production of fruits of understory species, which are key for the feeding of other wildlife, and in particular for the endangered *Tetrao urogallus*. Stablishing small exclosure plots is an effective method to reduce browsing of wild ungulates and increase the vitality of key understory plant species and pine seedlings. By increasing fruit production, we expect understory species to disperse into surrounding areas outside fences.

Fences are designed to difficult the entry of red deer or roe deer but to be permeable for the small wildlife. The fences will protect between ca. 0,08 and 0,5 ha each. Fences will be built using crossed logs of trees thinned in WP5 or task 6.5 (Figure 9) from trees that have been dried for at least a year, and without bark. They have a barricade structure with a 56º inclination, with reinforcement logs to increase the durability. Small diameter logs of *Pinus uncinata, P. sylvestris or P. nigra,* will be used as crossbars, crosspieces and reinforcements with which to create 3 m sections linked together until the entire fence is ideally arranged in a square, with 71 m of side (0.5 ha). The construction of each section of fence requires: 1 3.5 m reinforcement post; 6 3 m crossbars; and 1 2.5 m crosspiece. Thus, taking into account that each fence is about 0.5 ha, 94 sections are needed for each fence. Each fence requires about 744 post between 2.5-3.5 m long and 10-15 cm in diameter. The approximated total count of material for each fence is detailed in Table 19. Fences will be regularly monitored and additional transverse poles will be added if target species of wild ungulates (e.g red deer) are detected inside the fence.

In Larra-Aztaparreta, the fences have tried to hold on with the same tree vegetation in the area, and without the possibility of nailing them to the ground, due to their condition of karst soil, which makes it completely impossible.



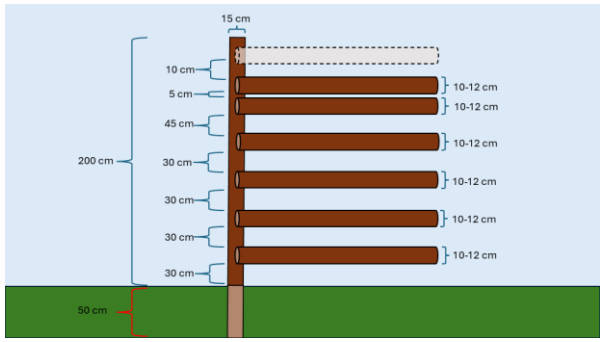


Figure 9. Fencing design details in the Hunting National Reserve of Bourmort.

Table 19. Technical specifications for wild ungulate exclosure plots in *Pinus uncinata* habitat.

Log tipology	Specification	Observation
Reinforcement	3.5 m	Minimum height to prevent jumping
Crossbars	3 m	Opening size ≤ 10 x 10 cm
Crosspieces	2.5 m	

6.1.11 Planting key habitat species in the fenced plots

In each fenced area described in Section 6.1.10, as well as in a comparable adjacent area accessible to ungulates, at least four representative understory species (Table 20) shall be planted. Seedlings shall be produced in an accredited nursery using seeds or cuttings sourced exclusively from the Pyrenean provenance area. The use of non-local genetic material or non-native varieties is strictly prohibited.

Planting operations shall be carried out by CTFC staff once the fences have been installed. In the subalpine zone, the recommended planting periods are late spring (May–June), after the risk of severe frost has passed, or early autumn (September–October), before the onset of winter conditions.

Site preparation within the exclosures shall minimise soil disturbance in order to preserve existing soil structure and reduce erosion risk. Planting holes shall be dug manually to avoid soil compaction and unnecessary disturbance to surrounding vegetation. To improve seedling

establishment and increase survival rates, locally sourced organic mulch (such as pine needles, bark, or other forest-derived material) may be applied around the base of the seedlings to retain soil moisture, reduce temperature fluctuations, and limit competing vegetation growth.

Table 20. Number of seedlings per species requested to the forest nursery (Forestal Catalana S.A.).

Species	Number of seedlings
Arctostaphylos uva-ursi	5000
Juniperus communis ssp. communis	2500
Cotoneaster intergerrimus	500
Rhamnus alpina	500

6.1.12 Monitoring report on labour and resources allocated to each task

The contractor shall compile a brief report detailing the allocation of material and human resources for each task in each stand.

The report shall include a descriptive sheet for each stand indicating:

- Start and end dates of the works.
- A table describing the number of workdays invested in each task and the equipment or means allocated to each.
- An observations section, where the contractor may provide any relevant considerations regarding the works carried out, such as difficulties or problems encountered, solutions adopted, mistakes and successes, etc.

The CTFC will provide a .docx template to be completed by the contractor with the required information.

6.2 Ecological and Technical Justification

6.2.1 Silvicultural treatments: improvement thinning, selective thinning and shrub clearing

Silvicultural treatments in forested and silvopastoral areas are ecologically justified as tools to restore structural heterogeneity, improve forest vitality, and enhance the functionality of forest–grassland mosaics in high mountain ecosystems. By reducing stand density and regulating shrub cover, these interventions support both forest conservation objectives and pasture recovery processes, while maintaining key habitat features for priority species.

- **Stand structure, tree vitality and natural regeneration:**

Selective and improvement thinning reduce competition among trees for light, water and soil nutrients, resulting in increased radial growth, improved crown development, and higher resistance to drought, pests and diseases. Reduced canopy density increases light availability at ground level and promotes seed germination and seedling establishment, enhancing natural regeneration processes. These effects are particularly relevant for the long-term conservation of subalpine forests, including Habitat Type 9430* – *Pinus uncinata* forests.

The creation of a heterogeneous mosaic of open areas, shrub patches and scattered trees enhances natural regeneration conditions for *Pinus uncinata*, improving light availability and reducing competition from dense shrub layers. This contributes to long-term stand resilience and structural diversity.

- **Understory development, pasture productivity and floristic diversity:**

Increased light penetration promotes a diverse herbaceous and shrub layer, enhancing both ecological and pastoral value. Grass-dominated communities include species such as *Agrostis capillaris, Festuca nigrescens, Anthoxanthum odoratum and Dichanthium ischaemum*, while moderate canopy cover favours the presence of legumes such as *Trifolium alpinum, Lotus corniculatus, Anthyllis vulneraria and Hippocrepis comosa*, which improve forage quality and contribute to soil nitrogen inputs.

Shaded microsites under partial canopy cover maintain green biomass during summer drought periods, increasing pasture resilience and extending forage availability. Overall, these processes increase plant diversity, structural complexity and ecosystem productivity.

- **Habitat heterogeneity and biodiversity functionality:**

Selective thinning and shrub clearing creates a mosaic of scattered trees, shrub patches and open areas that enhances habitat suitability for a wide range of taxa, including the *Tetrao urogallus*, as well as pollinators, invertebrates, birds and small mammals associated with forest–grassland ecotones.

They constitute ecotonal habitats of high biodiversity value between Eurosiberian and Mediterranean influences and support numerous species of community interest, including Parnassius apollo, Parnassius mnemosyne, Lagopus muta, Pyrrhocorax graculus and Montifringilla nivalis.

Management ensures the retention of fruit-producing shrubs (Sorbus aucuparia, Rubus idaeus, Juniperus communis) and conservation habitats such as boxwood formations (Buxus

sempervirens), which also function as refuges and nesting structures for fauna, particularly bird species.

For capercaillie, habitat requirements are addressed through:

- Lekking areas in semi-open mature pine stands (30–40% canopy cover)
- Nesting areas with dense shrub cover (50–70%, 30–80 cm height)
- Brood-rearing habitats combining herb-rich openings and shrub refuges
- Maintenance of fruit-producing shrubs (Vaccinium, Buxus, Sorbus, Rubus, Juniperus)
- Woody debris management (<10 cm) ensures habitat permeability and reduces physical barriers for chick movement.

Shrub control and pasture recovery also benefit the *Gypaetus barbatus* by maintaining open landscapes linked to extensive livestock systems, which provide carrion resources essential for its feeding ecology. Increased openness improves carcass detectability and enhances foraging efficiency.

At landscape scale, the interventions improve connectivity between pasture areas, facilitate livestock movement, increase forest permeability, and restore overall ecological functionality.

- **Ungulate management and forest regeneration**

By increasing pasture availability in open areas, ungulates are spatially redistributed towards grasslands, reducing browsing pressure on forest regeneration and understory vegetation in adjacent stands. This process improves seedling survival and supports the recovery of forest structure, particularly in sensitive subalpine pine ecosystems.

- **Wildfire risk reduction:**

Reduced tree density and shrub cover decrease fuel continuity and vertical fuel connectivity, limiting fire spread potential and reducing the risk of crown fire development. These changes increase landscape resilience and contribute to long-term ecosystem stability under increasing climatic stress.

Shrub reduction and discontinuous vegetation structures decrease fuel load and connectivity, reducing fire intensity and spread potential, particularly in forest–grassland ecotones.

6.2.2 Woody debris shredding to promote pasture regeneration

- **Fire Resilience:** Limiting the height of remains to 0.5m prevents the formation of "vertical fuel ladders," significantly reducing the risk of ground fires transitioning into the tree canopy.

- **Pasture Restoration (HIC 6210):** Lowering the height of remains ensures that light reaches the soil surface, which is critical for the rapid recovery of herbaceous species and the restoration of the priority grassland habitat.
- **Nutrient Cycling:** Smaller pieces in direct contact with the soil decompose faster, accelerating the return of nutrients to the ecosystem.
- **Accessibility:** These specifications ensure the area remains traversable for livestock and wildlife, supporting the wooded pasture (*adevesament*) management model.

7 Technical conditions for execution

7.1 General provisions

Strict compliance with all forestry and environmental protection regulations applicable to forests and natural areas shall be ensured. The actions shall conform to the descriptions and quantitative specifications set out in this document. Any modification shall be agreed upon by all parties and duly recorded.

All machinery and tools used in the implementation of the actions must be in perfect working condition and properly inspected. Personnel must be duly qualified or have demonstrable experience.

During periods when the contractor is not carrying out operations (public holidays, night-time, rainfall), forest roads and tracks must not be obstructed by logs, machinery or any other objects that could hinder traffic or pose a risk to users.

All existing infrastructure in the area (signage, fences, etc.) shall be respected, and any damage caused by the contractor shall be fully repaired by the contractor.

7.2 Silvicultural treatments

The entire intervention area has been fully marked by CTFC technical staff. The boundaries of the intervention area are not physically marked on the ground. To delimit the treatment area, operators shall follow the treatment marking and, in case of doubt, refer to the digital boundaries provided by CTFC in .KML format.

No climbing or vine species growing on trees that are not to be removed during the operations shall be cut.

In general, tree felling cuts shall be straight, made at ground level, and leave stumps with a height of less than 10 cm. However, some stumps may be left at a greater height (> 50 cm) eventually to enhance biodiversity through the generation of this type of deadwood. These high stumps shall

correspond to trees with rocks at the base or other obstacles that prevent safe cutting at ground level, or to trees with pronounced basal curvature or other stem defects.

Tree felling shall be carried out, as far as possible, in a manner that avoids trees falling onto retained trees or plant species of particular interest. Furthermore, felling shall be conducted so that extraction operations are progressive and stems are aligned. The fan-shaped effect, which may cause damage to regeneration or to other trees and plant species if a misaligned tree is dragged, shall be avoided. Previously identified extraction routes shall always be followed.

7.2.1 Interpretation of thinning marking

Trees are marked using different spray-painted symbols indicating the actions to be taken. Trees to be felled are marked in red, pink, or orange, according to the following criteria summed in Table 21.

Table 21. Type of actions on trees and marking indications

Actions	Marking
Tree to be felled	• Two or more dots on the stem and one dot at the base • The same tree may be marked for felling and simultaneously marked with another colour (green, blue, etc.).
Tree to be felled, leaving the stump as high as possible (≈1,3 m) Felled stem shall be delimbed and left lying on the ground	• One horizontal line at a height of 1.3 m and one dot at the base
Tree shall not be felled, except for reasons of operational necessity or worker safety	• Trees with no marking. • Trees marked with a white line on each side

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7.2.2 Interpretation of understory clearing marking

The understory has been marked using red and white plastic tape and red, pink or orange spray paint. The marked understory area shall serve as a guide and reference for applying the treatment in the unmarked area.

- The markings delineate the small patches of understory that are NOT to be cleared. The remaining understory within the marked area shall be cleared.
- In areas of the stand where no understory marking is present, operators shall decide which species to clear and which to retain, in accordance with the criteria set out in Section 6.1.3 Shrub cover management.

7.2.3 Extraction of timber obtained from thinning operations

Generally, delimbing shall be carried out within the stand, and stem extraction by skidding shall be performed towards the forest road or existing skid trail. Whole tree harvesting could be also performed, therefore delimbing would take place in the skidding trail or the stacking or loading area. Any other extraction method must be explicitly agreed with CTFC staff.

In all cases, stems shall be skidded aligned, and care shall be taken to avoid damage to the bark of retained trees. In addition, the extraction operations shall avoid disturbing water- or rock-related habitats (stone walls, water streams, etc.).

Some trees with a diameter greater than 20 cm may be left on the ground without extraction in order to provide downed deadwood within the stand, at an indicative maximum density of 10 trees per hectare, and always fully delimbed. Trees to be retained shall be those with no commercial value or where extraction would be complex or likely to cause significant damage to the soil, aquatic or rocky features, or to other trees and shrubs that must be preserved. In all cases, the stems to be left within the stand must be approved by the CTFC.

7.3 Protected areas

One hundred per cent of the intervention area is included within the Natura 2000 Network. Therefore, authorisation from the competent management authority is required (to be processed by the CTFC).

7.4 Areas of faunal and floristic interest

One hundred per cent of the intervention area is located within or near different areas of faunal and floristic interest.

7.5 Topography

The rugged terrain constitutes a limiting factor for the mechanisation of understory clearing within the intervention area. For this reason, the use of mechanical means shall be prioritised wherever possible, and where access with such means is not feasible, manual methods shall be employed.

7.6 Access

Access to the forest stands is of sufficient quality and density for the planned means of operation.

Upon completion of the contracted works, any forest roads or tracks used shall be left in the same condition as prior to the treatments, with any necessary repair works to be carried out at the contractor’s expense.

7.7 Public hydraulic domain

No known impacts on the public hydraulic domain have been identified.

7.8 Management of other waste

All non-forestry waste generated (chemical products, containers, packaging or other objects) shall be collected and removed from the forest by the contractor and managed selectively in accordance with applicable legislation.

Any containers, bags, plastic tapes and other small- or medium-sized waste already present within the stand shall also be collected and deposited in authorised containers or recycling facilities for selective treatment.

7.9 Work equipment

On the part of the contractor, operational staff responsible for tree felling and delimbing must have specific training and prior experience in the use of chainsaws. Personnel responsible for timber extraction must have specific training and prior experience in the use of winches and forestry tractors or other logging means. During operations, there must be personnel present within the stand with specific training in occupational risk prevention and first response to emergencies in forestry works.

7.10 Liaison and monitoring

CTFC technical staff shall act as the liaison body with the contractor's executive management and shall carry out periodic monitoring of the operations.

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