

WORKS FOR LAND AND SOIL PREPARATION IN GORJ COUNTY, FOR THE PURPOSE OF PLANTING WITH JUNIPER

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ABSTRACT

The habitat 4070 * Bushes with *Pinus mugo* and *Rhododendron myrtifolium* is a priority habitat of community interest, according to Directive 92/43 / EEC on the conservation of natural habitats, of flora and fauna. The juniper grows and develops vigorously on shady slopes, in humid conditions of air and soil, on not too humid soils, except for narrow valleys or depressions in which the snow accumulates in excessive quantities and stagnates until late spring. Juniper associations are characteristic of alpine podsoles and prepodsoles with crude, poor and acid humus. The work presents the conditions of the area (geology, geomorphology, climate, soil and hydrology) and the preparation works of land and soil, for 50 ha proposed for planting with juniper. The surfaces are part of Gorj county, South-West Oltenia region and are located on the territories of the localities Peștișani, Runcu and Stănești.

Key words: juniper, habitat, priority

INTRODUCTION

The habitat 4070 * Bushes with *Pinus mugo* and *Rhododendron myrtifolium* is a priority habitat of community interest, according to Directive 92/43/EEC on the conservation of natural habitats, of wild flora and fauna. In Romania, at present, occupies a total area of 50,000 hectares.

In the past, this type of habitat had a much greater presence in its specific area, at the transition between boreal and grassland forests, to the subalpine floor. By the action of the anthropic factors, the juniper bushes were destroyed by cutting or arson, the occupied surface being diminished in favor of the development of the areas occupied with pastures.

The habitat 4070 * has as a correspondent in the specialized literature, the Romanian habitat R3105 South-eastern Carpathian bush of juniper (*Pinus mugo*) with mountain peony (*Rhododendron myrtifolium*).

Phytocenoses of *Pinus mugo* are typical for the sub-alpine floor of the Romanian Carpathians, and the Carpathian-Balkan elements differentiate them from the

similar ones. The overall coverage is 90-100%. The layer of the bushes is composed of *Pinus mugo*, prevailing, and sporadic *Alnus viridis*, *Salix silesiaca*, *Ribes petraeum*, *Juniperus sibirica*. At the lower limit, in rarefied, also underdeveloped specimens of trees (*Pinus cembra*, *Picea abies*, *Sorbus aucuparia*) develop. The juniper layer is compact, with high densities. The layer of herbs and sub-bushes is built by *Rhododendron myrtifolium*, *Vaccinium myrtillus*, *Deschampsia flexuosa*, *Homogyne alpina*, *Luzula luzuloides*, *Luzula sylvatica*, *Oxalis acetosella*, *Calamagrostis villosa*.

This type of habitat is located as an individualized band that interpolates between spruce forests and subalpine meadows or as islands, sometimes extended. The altitudinal limits and the location of this type of habitat vary on different mountain peaks and on the same mountain ridges, depending on the exposure, wind direction and intensity.

The juniper is a shrub species of high altitude, specific to a cold and humid climate, not very demanding of the soil,

with very slow growth and long cycle of reproduction of the seedlings. (fig.1.)

The maturity of the specimens is early, at 6-10 years. It produces a heavy, dense wood, rich in resins.

In the Southern Carpathians the juniper vegetates at altitudes of 1600-2300 m, being excellent adapted to the harsh subalpine climate conditions. It occupies large areas, forming thick, compact, difficult to traverse associations in the lower alpine area.



Figure 1. *Pinus mugo*

The juniper develops vigorously on shady slopes, under normal humidity conditions in the air, on not too humid soils, except for narrow valleys or depressions in which the snow accumulates in excessive quantities and stagnates in spring until late. Juniper associations develop on alpine and subalpine pastures, which have characteristic soils of the type podsol and alpine prepodsol, distriambosol, eutricambosol, with crude humus, poor and acidic, whose formation contributes to a great extent.

Podsol and prepodsol alpine soil are favourable for the development of the *Pinus mugo* species, due to the following characteristics:

- ✓ low humus content
- ✓ large amount of organic matter
- ✓ low saturation in bases
- ✓ strong acid reaction (pH <4)
- ✓ poor microbiological activity
- ✓ poor nutrient supply

- ✓ sub-middle trofiticity

The typical eutricambosol soil type is found locally, on surfaces located at the border with the forests on the mountain and pre-mountain floor has the following characteristics

- ✓ fertile
- ✓ typical for pre-mountain and mountain beeches and for mixtures with pinewoods
- ✓ humus content = 2 - 4%
- ✓ high degree of saturation in bases
- ✓ reaction of soil weak acid-neutral (pH = 6.2-7.0)
- ✓ deep and well structured
- ✓ saturated in calcium
- ✓ high content of nutrients
- ✓ high capacity in useful water

Districambosols occupy 40% of the surface of the territory, being found on large areas, at altitudes between 630-1300 m. These types of soil are generated by the parental substrate, the morphology of rocks, the altitude of maximum 1600 m and the predominantly southern exposure of the surfaces available for planting.

The area is located in the Southern Carpathian region, the district of the mountains with medium heights, in the Vâlcan mountains area of the Retezat-Godeanu mountain range and in the transition area from mountains to hills. The area is characterized by a great geological diversity in terms of lithology and the age of the respective formations. The lithological substrate is decisive in the triggering and evolution of erosion phenomena, facilitating, in the absence or weak the protection offered by the forest vegetation, the triggering and the evolution of the erosion phenomena in surface and depth, with consequences in soil erosion, erosion, torrentiality, floods.

The hydrographic network causes the territory to be fragmented, with fast and rarely small slopes. The general features of the climate of the region are strongly influenced by the local physico-geographical conditions and relief,

producing a compartmentalization and diversification of the climate. Altitude and disposition play a major role in the time of budding and flowering of species.

The conservative value of the habitat is high, in Romania *Pinus mugo* is a protected species and of ecological importance, due to the following roles:

- ✓ anti-erosion (to protect mountain slopes and soil)
- ✓ filtering and regulating the flow of waters from precipitation on the slopes
- ✓ stopping the avalanches
- ✓ shelter for numerous species of plants and animals characteristic of the area
- ✓ increasing biodiversity
- ✓ maintaining the specificity of the mountain floor

MATERIALS AND METHODS

The surfaces proposed to carry out the ecological reconstruction of the habitat 4070 * Bushes with *Pinus mugo* and *Rhododendron myrtifolium*, by planting with the edifying species Juniper-*Pinus mugo* are located in the South-West Oltenia region, Gorj county, on the territory of Peștișani village (5 ha owned by Peștișani Community, in the area of La Lespezi-Arcanul de Jos), Runcu (25 ha on the lands owned by Muntele Runcu Community, in the area Șigleul Mare and Șigleul Mic) and Stănești (20 ha, land owned by Plaiurile Dobriței Community, in the area 99 and 100 administrative units, Mount Muncelu).(fig.2.)



Figure 2. Proposed area for ecological reconstruction from Runcu, Muntele Runcu Community, Șigleul Mic area

The planting works are based on the carrying out of afforestation, maintenance of forest crops and care of trees. Before starting the planting actions, chemical analyses of the soil are carried out, works for the production of *Pinus mugo* seedlings, which are carried out in nurseries, as well as soil and soil preparation works.

For the chemical analysis of the soil, 5 soil profiles were created, on the territory of Gorj county, in the following points:

- ✓ Administrative forestry unit Runcu, UP III, a.u. 11 C
- ✓ Tismania locality, Sângeriiș area
- ✓ The Celei Zone
- ✓ The Orlea Celei Zone
- ✓ The Șigleul Mare area, the Șigleul Mic area

Soil samples were collected from 2 or 3 levels of depth and the following quality indicators were determined, by applying the specific methods of analysis:

- pH (in aqueous solution, using the electrometric / potentiometric method, using the CONSORT 933 portable multiparameter / pH meter)
- carbonates (% , by volumetric method in aqueous Petersburgski extract)
- humus (% , by the Walklei and Black titrimetric method)
- Nt (% , by Kjeldahl method)
- Pm (mg / 100g soil, by Egner-Riehm-Domingo method, with buffered ammonium acetate-lactate solution, followed by spectrophotometric determination)
- Km (mg / 100g soil, by the method of ammonium lactate acetate)

The steps taken to prepare the land and the soil in Gorj County for planting with juniper are the following:

- identification and delimitation of the lands provided for planting (according to the STEREO 70 coordinate points; in the characteristic, boundary points, will be

placed concrete, parallelepiped concrete terminals with dimensions of 30x 30x70 cm, embedded in the ground)

- measurement of planting perimeter surfaces (for each distinct planting objective and perimeter, using specific GPS / total station equipment)

- realization of the system of records of the planting perimeters (the effective measurement of the delimited areas for the afforestation and the application of a numbering and records system: perimeter 1, perimeter 2, etc.)

- fencing the perimeters for planting (to ensure the protection of the plantation against the penetration of grazing animals; the distance between the wood poles, the planting depth, the complete placement of the wire on the established perimeter, the protection of the sides of the plantation exposed to the access of animals, will be respected).

- cleaning the land of stones, pits, shrubs and dry wood residues (to ensure the conditions for planting the seedlings and protecting them against the formation of stones on the slopes once the snow melts; the work includes removing the stones and pits from the planting sites, transporting them outside the areas to be regenerated)

- picketing the land (according to the scheme of 2,0 x 1,5 m; wood picks are made, with dimensions of 20 cm long, 1-2 cm thick, the pickets approach 50 cm distance, orient and fix the wire and twine on rows spaced at 2.0 m, picks are placed next to the points on the wire, ensuring the distance of the sprouts per row of 1.8 m)

- preparing of the soil in rabbles, around the surfaces where the seedlings will be planted (the work will be executed in July-August, before planting; the dimensions = 60 cm x 80 cm, the work being executed on an average depth of 15 cm; crush the clods, remove the roots, stones, gather and destroy the larvae and rake the land).

Following the analysis of the complex of the seasonal factors, the records of the stationary units for the planting perimeters

were established, by GPS method, coordinated by STEREO 70.

The formula of 100% afforestation of the surfaces on which the planting with the species *Pinus mugo* will be made was realized by the GPS method, coordinated by STEREO 70.

RESULTS AND DISCUSSIONS

The surfaces identified for planting are located in the area shown in figure 4, and their delimitation is shown in figure 5, proving that these surfaces are subalpine meadows, located above the forest boundary.

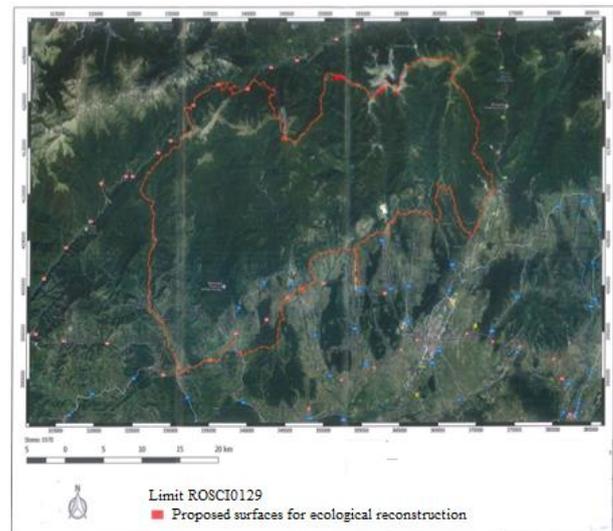


Figure 4. The area in which the identified areas for ecological reconstruction are located

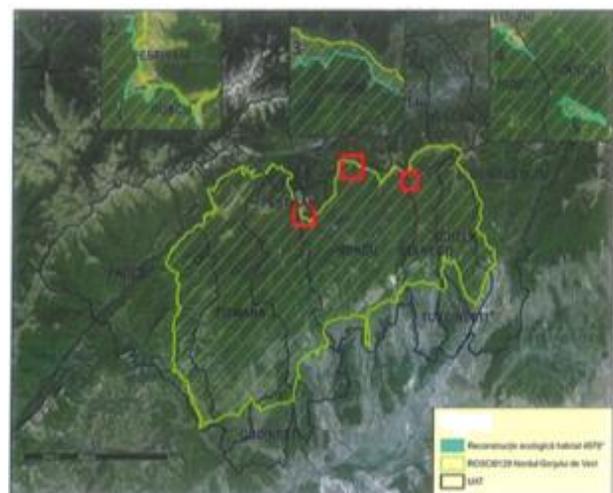


Figure 5. The areas delimited within the localities of Peștișani, Runcu, Stănești from Gorj county, for planting with the species *Pinus mugo*.

Regarding the soil chemical analysis, the results of the chemical analysis regarding the quality indicators determined from the soil samples collected from the 5 representative soil profiles from the areas where the ecological reconstruction will be carried out are shown in table 1.

The surfaces of the subalpine floor on which the planting with the species *Pinus mugo* will be made are shown in fig. 6.

The formula of 100% afforestation of the surfaces on which the planting with the species *Pinus mugo* will be realized is presented in fig. 7.

Table 1. Chemical analysis of soil quality indicators, harvested from representative soil profiles in the area where the ecological reconstruction will be carried out

Collection point for soil samples	Profile	Depth (cm)	pH	carbonates (%)	humus (%)	Nt (%)	Pm (mg/100g)	Km (mg/100g)
administrative forestry unit, Runcu, UP III, a.u. 11 C	P1	0-20	4,48	-	3,77	0,448	2,65	2,82
		20-70	4,93	-	1,74	0,112	0,72	1,11
		>70	5,14	-	0,90	0,056	0,36	2,45
Tismana, Sângeriş Zone	P2	0-25	6,13	-	3,17	0,21	6,03	0,99
		>25	6,47	-	1,79	0,126	7,3	1,37
Celei Zone	P3	0-20	7,02	0,2	3,33	0,196	48,38	5,69
		>20	7,51	0,2	2,58	0,140	17,05	0,91
Orlea-Celei Zone	P4	0-20	7,08	0,0	5,73	0,364	45,08	6,05
		>20	7,23	0,2	2,64	0,168	16,73	1,87
Şigleul Mare, Şigleul Mic Zones	P5	0-10	4,62	-	5,27	0,224	1,83	1,25
		10-50	4,30	-	9,97	0,476	3,31	3,56

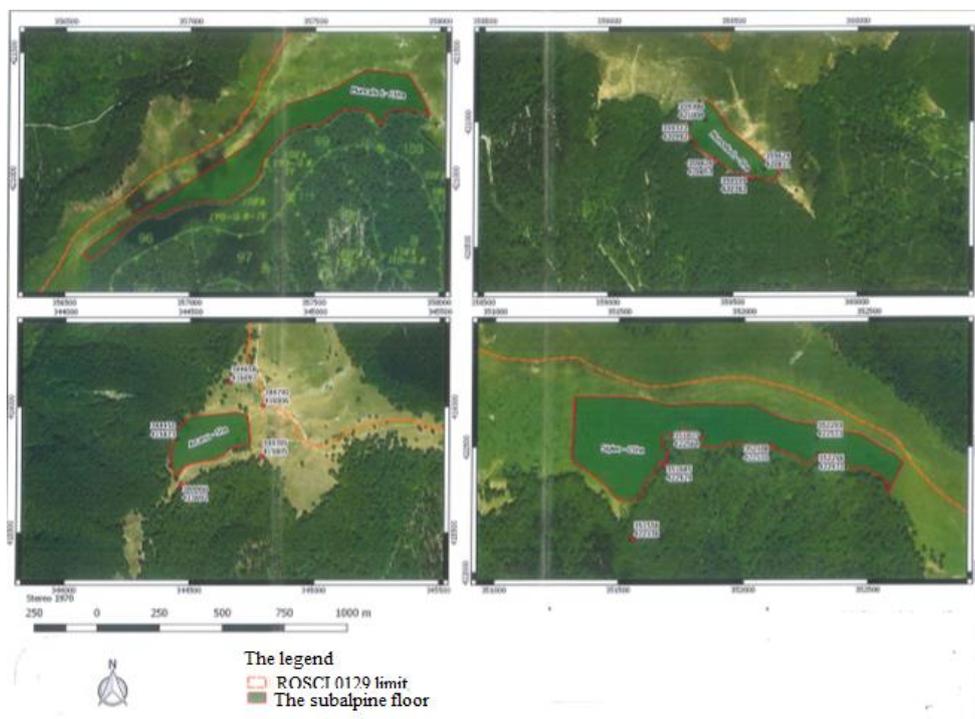


Figure 6. The surfaces of the subalpine floor to be planted with the species *Pinus mugo* (GPS, STEREO 70 coordinates)

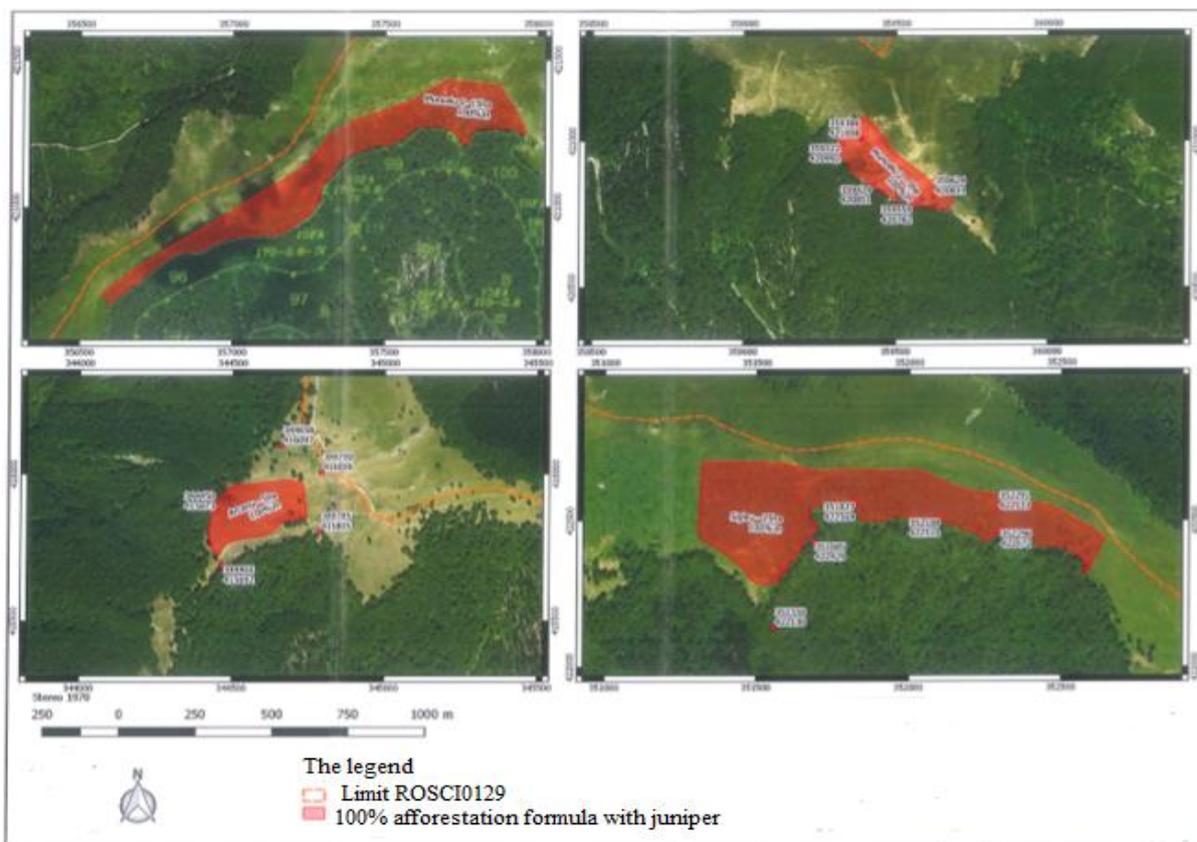


Figure 7. Formula of 100% afforestation of the surfaces to be planted with the species *Pinus mugo* (GPS, STEREO 70 coordinates.)

CONCLUSIONS

The habitat 4070 * *Bushes with Pinus mugo and Rhododendron myrtifolium* is a priority habitat of community interest, according to Directive 92/43/EEC on the conservation of natural habitats, of wild flora and fauna.

The surfaces proposed to carry out the ecological reconstruction of the habitat 4070 * *Bushes with Pinus mugo and Rhododendron myrtifolium*, by planting with the edifying species *Juniper-Pinus mugo* are located in the South-West Oltenia region, Gorj county, on the territory of Peștișani village (5 ha owned by Peștișani Community, in the area of La Lespezi-Arcanul de Jos), Runcu (25 ha on the lands owned by Muntele Runcu Community, in the area Șigleul Mare and Șigleul Mic) and Stănești (20 ha, land

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