

THE STAGE OF DEGRADATION OF THE PASTURES FROM THE BUCEGI NATURAL PARK

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Abstract. *The grasslands from Natural Parc of Bucegi are in very high antropic degradation representing 90-95% from the surface. Studies carried out by satellits in three cadastral map sheets representing a surface of 27,200 ha and evidenced a grassland surface of 7,300 ha (27%). Hase been evidenced a surface of 1,100 (14,5%) covered with wooden vegetation, over 60-80%, or are situated on the stones. The rest of 6,300 ha (about 85% from the total), the soil erosiune there is on 15%, rocks at surface – 13%, shrubs – 12%, weeds of pacage – 4%, resulting in finally over 52% of degraded grasslands due to the soil condition, invasion of shrubs and weeds. If it is adding the vegetal cover degraded by Nardus stricta which inseated the other types more valuable of grassland, it is remarking that only 5-10% from the grassland surfaces in managed adequately, that is a big problem.*

Keywords: Bucegi Natural Park, grassland phytosociological alliances, stage of deterioration.

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1. Introduction

The grasslands of the Bucegi Natural Park, covering an area of approximately 11,300 hectares, are predominantly of secondary origin, formed after the clearing of forests (700–1,800 m a.s.l.) and junipers (1,800–2,200 m a.s.l.), and of primary origin in the alpine level (above 2,200–2,300 m a.s.l.), up to 2505 m at Omu Peak.

In 2004, a study was carried out regarding the identification and inventory of grasslands within three cadastral map sheets, namely:

1. L35 – 87 Db – 9.055 hectares
2. L35 – 87 Dd – 9.053 hectares
3. L35 – 99 Bb – 9.089 hectares

Identification was performed using satellite images at a 1:25,000 scale and cadastral maps at the same scale. These three map sheets, covering an area of

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27,197 ha, represent the ‘core’ of the Bucegi Natural Park, which has a total area of 32,663 ha.

2. Results obtained

In the first approximation, five herbaceous phytosociological alliances and one shrub-herb alliance [1, 2, 5] were identified, as follows:

1. **Potentillo ternatae – Nardion** (PON), Subalpine oligotrophic grasslands on acidic soils, characterized by the following key and dominant species: *Nardus stricta*, *Festuca nigrescens*, *Festuca airoides*, *Poa media*, *Potentilla ternatae*, *Campanula abientina*, *Geum montanum*, *Ligusticum mutellina*, *Deschampsia flexuosa*, *Viola declinata* and others.

2. **Seslerion bielzii** (SEB), Subalpine primary grasslands on basic soils, having as species of recognition and edification: *Sesleria bielzii*, *Sesleria rigida* ssp. *haynaldiana*, *Festuca amethystina*, *Festuca saxatilis*, *Festuca versicolor*, *Linum extraaxillare*, *Dianthus spiculifolius*, *Carex sempervirens*, *Aster alpinus* and others.

3. **Oxytropido-Elynion** (OXE), Alpine primary grasslands on basic soils, with the species of recognition: *Oxytropis carpatica*, *Elyna myosuroides*, *Erigeron uniflorus*, *Dianthus glacialis*, *Cerastium lanigerum*, *Pinguicula alpina*, *Pedicularis verticillata*, *Salix reticulata*, *Dryas octopetala*, *Polygonum viviparum*, *Gentiana nivalis* and others.

4. **Juncion trifidi** (JUT), Alpine primary grasslands on acidic soils with the species of recognition and edification: *Juncus trifidus*, *Carex curvula*, *Oreochloa disticha*, *Campanula alpina*, *Primula minim*, *Minuartia sedoides*, *Armeria alpina* and others.

5. **Cynosurion** (CYN), Mesophilic grasslands hilly – mountainous on well-drained soils, having as species of recognition: *Agrostis capillaris*, *Cynosurus cristatus*, *Festuca rubra*, *Festuca pratensis*, *Lolium perenne*, *Phleum pratense*, *Trifolium repens* and others.

6. **Rhododendron myrtifolii-Vaccinion** (RHV), Rhododendron scrub, with defining species: *Rhododendron myrtifolium*, *Vaccinum gaultherioides*, *Vaccinum myrtillus*, *Vaccinum vitis-idaea*, *Loiseleuria procumbens*, *Soldanella pusilla*, *Juniperus sibirica* and others.

The distribution of these grassland units across the three cadastral map sheets is presented in Table 1.

From presented data in the table, it follows that the largest share is represented by the degraded grasslands dominated by the species *Nardus stricta* and *Festuca*

airoides, marked on the map as PON. They cover 2/3 of the surface, indicating the very advanced stage of degradation of the herbaceous cover [3, 4].

Table 1 Distribution of some grassland units in the Bucegi Natural Park in 2004

No. Crt.	Polygon L35	Surface (ha)	Phytosociological alliance					
			PON	SEB	OXE	JUT	CYN	RHV
1.	87 Db (North)	2.435	1.380	475	435	40	-	105
2.	87 Dd (Middle)	3.025	1.955	955	-	-	-	115
3.	99 Bb (South)	815	790	-	-	-	25	-
	TOTAL	6.275	4.125	1.430	435	40	25	225
	%	100	65.7	22.8	6.9	0.6	0.4	3.6

This is followed by the SEB rocky meadows with 23% of the surface, the alpine pastures on the highest peaks OXE and the rest JUT and CYN with barely 1%.

It is worth noting the rather good representation of RHV scrublands, which reach 3.6% of the total area of grasslands analyzed.

From the field studies carried out on the stage of grassland degradation, it was found that only 6,275 ha have a grass cover that qualifies them to be included in this land-use category. The remaining 1,071 ha (14.5% of the 7,346 ha outlined by the computer) have switched to another category of use because they have over 60-80% wood vegetation cover or are on rocks.

In addition, on the 6,275 ha observed in the field, approx. 15% are affected by surface and soil depth erosion, 13% are on rocks, 12% are covered in different proportions by juniper bushes and spruce seedlings in areas where pastures are in different stages of abandonment. The 250 ha (4% of the area) invaded by nitrophilous weeds because of over-paddocking (Table 2) should not be overlooked.

Thus, in the three plots analyzed from 7,346 ha of grasslands established by the computer according to satellite images and 6,275 ha delineated through direct field observations, a surface of 3,836 ha of severely degraded grasslands was recorded, due to soil erosion, presence of rocks on the surface, woody vegetation invasion, over-paddocking, and other causes representing 52.2% of the total, which is extremely serious.

If to this is added the degradation of the grass cover of pastures by the installation up to dominance of the species *Nardus stricta* instead of other types of more valuable grassland such as *Agrostis capillaris*, *Festuca rubra*, and others, at altitudes between 700 and 2200 m, the valuable grasslands barely reach 5–10% of the area.

Table 2 The stage of degradation of the grasslands in the Bucegi National Park in 2004

No. Crt	Polygon L35	Surface (ha)	Rocks	Erosion	Bushes	Paddock weeds	TOTAL	
							Degraded (ha)	%
1.	87 Db (North)	2.435	330	355	290	70	1.045	43
2.	87 Dd (Middle)	3.025	470	510	430	90	1.500	50
3.	99 Bb (South)	815	10	70	50	90	220	27
	TOTAL	6.275	810	935	770	250	2.765	44
	%	100	12.9	14.9	12.2	4.0	44.0	*

From the presentation of these preliminary studies, as a general conclusion it can be stated that the grasslands of the Bucegi National Park are in a very advanced stage of degradation, requiring further detailed studies regarding their extent, grassland types, productivity, possible stocking rates and other measures to stop the degradation, to carry out the ecological reconstruction of the degraded grassland and the conservation of biodiversity until it is too late.

Conclusions

(1)The permanent grasslands of the Bucegi Natural Park, with a total area of 7,346 ha, two decades ago were invaded in different proportions with about 14.5% (1,070 ha) of arboreal vegetation.

(2)Of the remaining grassland area of 6,275 ha, 66% is represented by the phytosociological alliance *Potentillo ternatae*–*Nardion*, 23% by *Seslerion bielzii*, 7% by *Oxytropido*–*Elynion*, 0.4% by *Cynosurion*, and 3.6% by *Rhododendron myrtifolii*–*Vaccinion*, most of which are degraded.

(3)Forty-four percent of the grassland area (6,275 ha) is affected by various degradation factors, as follows: 13% is located on rocky outcrops, 15% is affected by wind and rainwater erosion, 12% by shrub invasion, and 4% by invasion of nitrophilous weeds due to overpaddock.

(4)At present, after 20 years, the degradation of the grass cover due to afforestation and other negative abiotic and biotic factors is much more advanced,

requiring a new assessment and the urgent implementation of ecological restoration measures.

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