

MANAGEMENT PLAN CONSIDERATIONS FOR RÂPA ROȘIE NATURAL RESERVATION

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Abstract:

The present paper presents a description of the Natural Reservation Râpa Roșie. Because of the need to protect this area, in recent years this has produced the need for a natural reservation. Although each Natural Reservation is different, many important values remain the same. Therefore, there are different reservations with different types of natural protection, like: geological, landscape and a range of biodiversity protections (flora and fauna), pedological and speological protection. Of national importance, Râpa Roșie is located near Sebeș, in the centre of Romania. It exhibits spectacular forms of natural soil erosion of the Secașelor plateau, an area measuring over 25 ha (fig. 1),(Borza Al. 1959). The reservation is home to many rare plant species, such as *Cotoneaster integerrimus*, *Centaurea atropurpurea*, *Dianthus serotinus*, *Cephalaria radiata* and *Asplenium adiantum-nigrum*. Although founded as a National Reservation decades ago, it was only recently proposed as a Natural 2000 site.

Keywords: Râpa Roșie, management plan.

1. Introduction

The management plan for Râpa Roșie is extremely important for this reservation, as it may be the only way we can monitor the ‘good’ and ‘bad’ elements and hence implement a workable strategy to address them. Therefore, we can now identify the needs for this reservation and implement them within the management plan.

The import of certain objectives for the implementation of this management plan is a critical component for a successful system. Once we determine the principal objectives, we can then quickly see the problems or the benefits within the reservation perimeter (Appleton M.R., at all, 2001).

An important objective in this management plan is: evaluating the human impact upon biodiversity parameters and identifying viable solutions for decreasing these negative effects.

In order to identify the main objectives, we made a comprehensive study and reconstruction of this area to conclude the following:

The study of biodiversity from the Râpa Roșie (Fig.1.) reservation includes, bird cataloguing(Tab.2.), amphibian and reptile inventory, flora and habitat study(Tab.1.).

- We used the acquired information for additional databases and further monitoring activities.

- We studied the geology and geomorphology types of soils (Bleahu M., at all VI, FI,1976).

- We identified the points for S.W.O.T analysis, which detected both the strong and

weak points of the reservation and the opportunities and threats it represents.

- We surveyed and marked the reservation's perimeter, installed informative signs within the reservation and on the main access roads, created and distributed informative leaflets in various prominent points and published information on a special purposely created website. These measures are in order to establish an eco friendly environment that will promote efficient and environmentally sound tourism industry and in doing so, limit its negative impact on the surrounding biodiversity (Wells M. and Brandon K. 1992).

- We established and recognized new thematic paths integrated in a network of surrounding geo-cultural objectives.

- We removed all evidence from our camp area to include the removal of litter and the relocation of camp fire pits, by creating specially designated lay-over areas.

After the completion of studies made by specialists in different fields to include: Biology, Geology and Ecology, different 'management plan' recommendations were implemented that would support and rearrange the reservation habitats and increase the area's protection.



Fig.1. Natural Reservation Râpa Roșie

2. Material and Methods

The methodology used in the study of vegetation was the classical one, using the relevé technique.

The importance of a legal base in a management plan is of an utmost concern. The management plan should fulfil certain conditions in order to be accepted and should meet the standards set by the national laws.

The plan was released concordantly to the following demands:

Appendix 1 from OUG 57/2007 regarding the specific régime of the protected natural

areas, the conservation of natural habitats, of their flora and wild fauna.

We also used the SWOT analysis: is an analytical method of a project, plan or of an affair. The name is an acronym pertaining to the English language and it's descriptive: Strengths, Weaknesses, Opportunities, Threats.

The Cost/Benefits analysis was another method that we used. The cost-benefits approach tries to solve these problems by detailing the real costs and benefits of the environmental control operations. The cost-benefits analysis is practically incorporable into the traditional engineering analyses and is, in a larger sense, an evaluation of the costs in comparison to the benefits (Muntean, O. L., 2004)

3. Results and Discussions

3.1 Floristic analysis

The vascular plant species identified within the studied perimeter are as presented in the following table(Tab.1.):

Table.1.

Vascular plant species inventory

Family	Species	Family	Species	
<i>Betulaceae</i>	<i>Carpinus betulus</i>	<i>Lamiaceae</i>	<i>Ajuga chamaepytis</i>	
<i>Fagaceae</i>	<i>Quercus petraea</i>		<i>Glechoma hirsuta</i>	
	<i>Quercus pubescens</i>		<i>Lamium galeobdolon</i>	
	<i>Quercus robur</i>		<i>Salvia nutans</i>	
<i>Urticaceae</i>	<i>Urtica dioica</i>		<i>Salvia pratensis</i>	
<i>Ulmaceae</i>	<i>Ulmus foliacea</i>		<i>Salvia transsilvanica</i>	
<i>Polygonaceae</i>	<i>Fagopyron esculentum</i>		<i>Stachys recta</i>	
<i>Chenopodiaceae</i>	<i>Kochia prostrata</i>		<i>Teucrium chamaecyparis</i>	
<i>Caryophyllaceae</i>	<i>Dianthus carthusianorum</i>		<i>Teucrium montanum</i>	
	<i>Dianthus giganteus</i>		<i>Thymus marchallianus</i>	
	<i>Stellaria holostea</i>	<i>Thymus pannonicus</i>		
	<i>Stellaria media</i>	<i>Linaria angustissima</i>		
	<i>Stellaria nemorum</i>	<i>Linaria genistifolia</i>		
<i>Euphorbiaceae</i>	<i>Euphorbia cyparissias</i>	<i>Scrophulariaceae</i>	<i>Odontites serotina</i>	
	<i>Mercurialis perennis</i>		<i>Verbascum phoeniceum</i>	
<i>Ranunculaceae</i>	<i>Adonis vernalis</i>		<i>Verbascum speciosum</i>	
	<i>Corydalis solida</i>		<i>Veronica chamaedrys</i>	
	<i>Crataegus monogyna</i>		<i>Veronica teucrium</i>	
	<i>Ficaria verna</i>		<i>Plantaginaceae</i>	<i>Plantago media</i>
	<i>Thalictrum minus</i>		<i>Gentianaceae</i>	<i>Centaurium umbellatum</i>
<i>Brassicaceae</i>	<i>Alyssum alyssoides</i>	<i>Oleaceae</i>	<i>Ligustrum vulgare</i>	
	<i>Erysimum repandum</i>	<i>Rubiaceae</i>	<i>Asperula glauca</i>	

	<i>Lepidium draba</i>		<i>Cruciata glabra</i>
	<i>Sinapis arvensis</i>		<i>Sambucus racemosa</i>
<i>Crassulaceae</i>	<i>Sedum maximum</i>	<i>Caprifoliaceae</i>	<i>Viburnum lantana</i>
<i>Cistaceae</i>	<i>Helianthemum nummularium</i>		<i>Viburnum opulus</i>
<i>Rosaceae</i>	<i>Agromonia eupatoria</i>	<i>Valerianaceae</i>	<i>Valerianella rimosa</i>
	<i>Fragaria vesca</i>	<i>Dipsacaceae</i>	<i>Cephalaria radiata</i>
	<i>Geum urbanum</i>		<i>Cephalaria uralensis</i>
	<i>Potentilla anserina</i>	<i>Campanulaceae</i>	<i>Campanula sibirica</i>
	<i>Potentilla argentea</i>	<i>Asteraceae</i>	<i>Achillea millefolium</i>
	<i>Prunus spinosa</i>		<i>Achillea setacea</i>
	<i>Prunus tenella</i>		<i>Artemisia campstris</i>
	<i>Rosa canina</i>		<i>Artemisia pontica</i>
<i>Rosa gallica</i>	<i>Aster amellus</i>		
<i>Fabaceae</i>	<i>Astragalus glycyphyllos</i>		<i>Aster lynosyris</i>
	<i>Astragalus monspessulanus</i>		<i>Centaurea atropurpurea</i>
	<i>Astragalus vesicarius</i>		<i>Centaurea micranthos</i>
	<i>Cytisus albus</i>	<i>Hieracium bauhinii</i>	
	<i>Cytisus hirsutus</i>	<i>Inula ensifolia</i>	
	<i>Cytisus nigricans</i>	<i>Jurinea mollis ssp. transsilvanica</i>	
	<i>Dorycnium herbaceum</i>	<i>Scorzonera austriaca</i>	
	<i>Medicago minima</i>	<i>Tanacetum corymbosum</i>	
	<i>Melilotus albus</i>	<i>Liliaceae</i>	<i>Allium flavum</i>
	<i>Melilotus officinalis</i>		<i>Allium rotundum</i>
<i>Robinia pseudacacia</i>	<i>Gagea pratensis</i>		
<i>Trifolium montanum</i>	<i>Muscari comosum</i>		
<i>Malvaceae</i>	<i>Althaea hirsuta</i>		<i>Muscari tenuiflorum</i>
<i>Tiliaceae</i>	<i>Tilia cordata</i>	<i>Iridaceae</i>	<i>Iris pumila</i>
<i>Linaceae</i>	<i>Linum tenuifolium</i>	<i>Cyperaceae</i>	<i>Carex caryophyllacea</i>
<i>Rutaceae</i>	<i>Dictamnus albus</i>		<i>Carex humilis</i>
<i>Aceraceae</i>	<i>Acer campestre</i>		<i>Carex michelii</i>
	<i>Acer platanoides</i>		<i>Carex pilosa</i>
	<i>Acer tataricum</i>		<i>Carex tomentosa</i>
<i>Rhamnaceae</i>	<i>Rhamnus cathartica</i>	<i>Poaceae</i>	<i>Agropyron intyermidium</i>
<i>Celastraceae</i>	<i>Evonymus verrucosus</i>		<i>Agropyron pectiniforme</i>
<i>Apiaceae</i>	<i>Bupleurum falcatum</i>		<i>Andropogon ischaemum</i>
	<i>Eryngium campestre</i>		<i>Brachypodium pinnatum</i>
	<i>Falcaria vulgaris</i>		

		<i>sylvaticum</i>
	<i>Peucedanum cervaria</i>	<i>Chrysopogon gryllus</i>
	<i>Peucedanum tauricum</i>	<i>Cleistogenes serotina</i>
	<i>Pimpinella saxifraga</i>	<i>Dactylis glomerata</i>
<i>Cornaceae</i>	<i>Cornus mas</i>	<i>Festuca pratensis</i>
	<i>Cornus sanguinea</i>	<i>Festuca rupicola</i>
<i>Primulaceae</i>	<i>Primula veris</i>	<i>Festuca valesiaca</i>
<i>Convolvulaceae</i>	<i>Convolvulus arvensis</i>	<i>Phragmites australis</i>
<i>Boraginaceae</i>	<i>Caucalis lapulla</i>	<i>Stipa capillata</i>
	<i>Onosma pseudoarenaria</i>	<i>Stipa pulcherrima</i>

Endangered plant species

A number of 8 endangered plant species have been identified in the studied perimeter as being characteristic to the xerophilous grasslands or to the Xerothermic subcontinental Oak wood ecosystems:

- *Cephalaria radiata* – (endangered endemic taxon) is present scarcely on intensely eroded surfaces, with a marly substrate, on terrains with a low vegetation coverage.
- *Cephalaria uralensis* – (endangered endemic taxon) appears with a higher frequency than the previous species, on terrains with a higher vegetation coverage.
- *Onosma pseudoarenaria* – (globally endangered taxon) can be found scarcely in the 62C0* Ponto-Sarmatic steppes habitat.
- *Jurinea mollis* ssp. *transsilvanica* – (endangered endemic taxon) can be rarely found in the grasslands located on the Eastern side of the protected area.
- *Salvia transsilvanica* – (endangered endemic taxon) can be found mainly in communities dominated by *Stipa pulcherrima*. It is a very frequent species in the reservation.
- *Salvia nutans* – rarely found in the mesophilous grasslands on the Eastern side of the reservation.
- *Centaurea atropurpurea* – an extremely rare species, but extremely common in the well preserved grasslands of the studied area.
- *Quercus pubescens* – forms warmth-loving mixed Oak woods, well clustered in the Northern side of the reservation and small groups of just a few individuals located on the steep slopes.

The main Natura 2000 types of habitats (after Gafta *et* Mountford, 2008) that have been identified in the studied area are as follows:

- 91H0* Pannonian woods of *Quercus pubescens*
- 62C0* Ponto-Sarmatic steppes
- 40A0* Subcontinental peri-Pannonic scrub
- 40A0* Subcontinental peri-Pannonic scrub

3.2 Fauna

Within the Natural Reservation Râpa Roşie, the fauna consists of: avifauna, herpetofauna, insects and mammal fauna.

3.2.1 Avifauna

The avifauna is represented by numerous species of birds, which have been observed during our terrain observations.

Among the species encountered we primarily bring out the presence of a number of *Buteo buteo* individuals, found in an obvious east-west passage. The large number of ravens, *Corvus corax*, was surprising. The rest of the species present are shown in the table below (Tab. 2).

Table 2.

List of bird species encountered within the reservation

Latin denomination	Common denomination	Nr. of exemplars
<i>Alauda arvensis</i>	sky lark	4
<i>Accipiter gentilis</i>	goshawk	3
<i>Aegithalos caudatus</i>	long tailed tit	2
<i>Buteo buteo</i>	common buzzard	10
<i>Carduelis carduelis</i>	European goldfinch	8
<i>Carduelis chloris</i>	Greenfinch	1
<i>Coccothraustes sp.</i>	hawfinch	2
<i>Corvus corax</i>	raven	15
<i>Corvus cornix</i>	hooded crow	1
<i>Circus cyaneus</i>	hen harrier	3
<i>Dendrocopos major</i>	great spotted woodpecker	2
<i>Erithacus rubecula</i>	European robin	2
<i>Fringilla coelebs</i>	chaffinch	3
<i>Falco tinnunculus</i>	common kestrel	1
<i>Garrulus glandarius</i>	jay	2
<i>Miliaria calandra</i>	corn bunting	7
<i>Parus caeruleus</i>	blue tit	2
<i>Parus major</i>	great tit	6
<i>Parus palustris</i>	marsh tit	2
<i>Passer domesticus</i>	house sparrow	20
<i>Passer montanus</i>	tree sparrow	5
<i>Phoenicurus ochruros</i>	black redstart	2
<i>Phylloscopus collybita</i>	chiffchaff	3
<i>Pica pica</i>	magpie	3
<i>Saxicola rubetra</i>	whinchat	2
<i>Sitta europaea</i>	nuthatch	3
<i>Strix aluco (dead)</i>	tawny owl	2
<i>Sturnus vulgaris</i>	European starling	10
<i>Troglodytes troglodytes</i>	wren	2
<i>Turdus philomelos</i>	song thrush	2
<i>Turdus merula</i>	blackbird	9

3.2.2 Herpetofauna

The herpetofauna is represented by the species of reptiles and amphibians identified in the perimeter of the natural reservation. It is quite vast, considering the small surface.

The most important species of amphibians identified are:

Bombina variegata (yellow-bellied toad), *Bombina bombina x variegata* (hibrid forms between the yellow-bellied and the fire-bellied toad, *Bombina bombina*), *Hyla arborea* (common tree frog), *Rana dalmatina* (agile frog). The low number of amphibian species is due to the lack of reproduction ponds.

The reptile species identified within the reservation are the following:

Lacerta agilis (sand lizard), *Lacerta viridis* (green lizard), *Podarcis muralis* (common wall lizard), *Anguis fragilis* (slow-worm), *Coronella austriaca* (smooth snake)

4. The environment quality within the natural reservation

Pollution and degradation sources:

The greatest pollution and degradation sources for the area are represented by the animal farms within it. These reach closely to the inner part of the reservation, thus destroying numerous flora and fauna habitats.

Another source of pollution is of the atmospheric kind, connected to the wood manufacturing factories from Sebeş. Through the emission chimneys there's a daily release of toxic pollutants into the environment, pollutants that can affect both the quality of the environment and of the life in the region. Another pollution source can be considered to be the water pollution with waste and plastic. The Secaş River, as well as the drainage channels constructed for an eventual flooding, is filled with waste and plastic bottles, being even used, in some areas, as dumping grounds, due to the enormous quantity of waste.

Also, due to the incontrollable free tourism, there's also a visual pollution and degradation of the area.

5. Conclusion

The main management recommendations are as follows:

- Systematic evaluation of biodiversity.
- Stopping grazing rights, as this leads to the destruction of crucial natural habitats and eco systems.
- To increase studies and investigations to a higher level and frequency than they are presently used.
- Awareness Programs for the citizens of Sebeş town and nearby villages, so as to inform them of what importance the biodiversity protection in Râpa Roşie holds.
- Installation of informative panels and route direction displays
- Implement a nature interpretation program
- Have a well defined local guiding system (reservation's perimeter, informative panels, informative leaflets, marked trails) for tourists.
- Involvement of the local officials in the processes of evaluation and planning of further common preservation activities.

The absence of a management plan could have a serious negative impact on the reservation's biodiversity (Bleahu M. 2004). This negative influence would appear mainly due to the antropic factor, which, in this reservation, is very strong and can be easily seen in all areas. Spring and autumn fires, intensive grazing, climbing on the slopes, incontrollable free tourism are just a few of the negative antropic elements that need to be addressed.

In Romania there is a distinct lack of viable eco friendly management plans for the increasing natural reservation areas. In each reservation which already had a management plan implemented, this seemed to have an important positive and beneficial effect (Godeanu S. at all, 2007).

The new legislation specifies that every natural reservation must have a new management plan based on actual case studies, with which to construct an accurate and workable system, which must not only seem logical but an absolute necessity (Low nr. 5 din 6 martie 2000).

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CONSIDERAȚII PRIVIND PLANUL DE MANAGEMENT PENTRU REZERVAȚIA NATURALĂ RÂPA ROȘIE (Rezumat)

Rezervația Naturală Râpa Roșie (Fig. 1) este situată la nord de orașul Sebeș la aproximativ 3 km, pe drumul ce leagă această localitate de satul Daia Română. Râpa Roșie este o rezervație geologică și peisagistică cu o suprafață de 25 ha. Din punct de vedere geologic perimetrul protejat prezintă depozite detritice constituite dintr-o alternanță de argile roșii, gresii cenușii și roșii, gresii albe friabile, marne roșii – cărămizii, marne calcaroase albe. Acestea sunt formațiuni ușor friabile în care șiroirea însoțită de procesele de sufoziune, tasare și prăbușiri au sculptat bogăția de forme care fac din Râpa Roșie un monument de o rară frumusețe. Pereții săi au înălțimi cuprinse între 80 și 100 m. Pe abruptul Râpei Roșii solul este spălat, apar la zi argile, gresii, conglomerate. Solul cu caracter zonal (cernoziumul levigat – puțin roscat) predomina porțiunea cu pante mai domoale situata in partea superioara a abruptului. De o parte și de alta a Râpei Roșii se întâlnesc solurile brune de pădure și regosolurile. Pseudorendzinele sunt adeseori asociate cu regosoluri formate pe roci carbonatice moi (marne, marne argiloase și argile marnoase)(Trufaș V.,1962). Tot aici se pot întâlni și câteva specii vegetale rare (*Cotoneaster integerrimus*, *Ephedra distachya*, *Centaurea atropurpurea*, *Dianthus serotinus*, *Cephalaria radiata*, *Asplenium nigrum*).

Necesitatea unui plan de management a zonei, cât și a unor studii de actualitate este extrem de mare, scopul fiind acela de a oferi premisele protejării și conservării unor eșantioane care cuprind elemente naturale cu o deosebită valoare sub aspect paleontologic, geologic-geomorfologic, floristic și faunistic, oferind în același timp posibilitatea vizitării în scop științific, educativ și recreativ.

Inventarierea speciilor de plante și animale a constituit punctul de pornire în realizarea studiilor care au stat la baza elaborării unui astfel de plan. Astfel, datele existente în planul de management sunt recente, observațiile și colectările de materiale fiind realizate pe parcursul anului 2008.

Măsurile de gospodărire a perimetrului protejat se vor afla într-o permanentă modificare conform cerințelor fiecărui moment, atât pe plan științific cât și local.