

## The Flora and plant communities

Retezat is famous for its floral diversity, sheltering around 1190 superior plants species of the 3450 species known in Romania. The existence of more than a third of the Romanian flora in this area is one of the reasons for which it was declared a National Park. An approximate number of inferior species adds to the above-mentioned ones.

This is the reason why the interest of the botanists in the flora of Retezat started quite early, in the second half of the 18th century. However, representative works for the area appeared later, *Borza (1934)*, *Nyarady (1958)* (who published "*The Flora and Vegetation of the Retezat Mountains*") and *Csuros and others (1956)* having a great contribution. Over 90 **endemic**

**c species?, of**

a total of 127- 400 endemic species? in Romania, are extremely important to conservation of the plants in Retezat. The first endemic plant reported in RNP, was the ,

*D*

*draba dorerii*

, discovered in 1858 by Heuffel.

The 130 **rare or vulnerable plants** of the " Red list of the superior plants in Romania" (published in 1994- Oltean and others) are also of great importance.

*Pedicularis exaltata*, species belonging to the flora of RNP, is recorded in Annex III to Law 462/2001- animal and plant species whose conservation requires the determination of the special conservation areas and in Annex IV and requires a strict protection. Moreover, other two species, namely the yellow gentian ( *Gentiana lutea*) and the

snowdrop (

*nthus nivalis*

*Gala*

) are recorded in Annex V of the species for which the exploitation and collection? requires management measures.

From a genetic point of view, The Retezat Mountains represent the **center** for the *Hieraci*

*um* genus, which includes in the area 257 species , some of them endemic, like

*Hieracium borzae*, *Hieracium nigrilacus*

. It also represents the genetic center for the

*Poa*

genus, which includes 31 taxa. Moreover, an entire series of species and infra-taxa (subspecies?) have their classic place here:

*Barbarea lepuznica*, *Centaurea retezatensis*, *Oxytropis jacquinii* ssp.*retezatensis*,

*Hypochoeris maculata* var. *carpatica*, *Festuca rupicola* var.*retezatensis*.

The area - geographic analysis of the flora points out as predominant the general Eurasian elements, consisting of 44%; there are also circumpolar (13%), alpine (9%), European (12%), southern (6%), Asian (5%), endemic (7,2%), poly core (3,4%) and adventive (1,4%) elements.

There are over 60 **plant associations** of cormophite included in 10 classes of vegetation; this proves once again the floral diversity of the Retezat Mountains. The most various

associations can be found here: from

*Pino-Quercet*

*um moehringietosum pendulae*

in the low regions of the RNP to

*Oreochloo- Juncetum trifidi*;

its populate, on small areas, the peaks, crests and very inclined slopes of the alpine level. Being highly important from the point of view of the flora,

### **the calcareous area of the Retezatul Mic**

has a large number of rare and/ or endemic plants such as

*Barbarea lepuznica*,

*Pedicularis baumgarteni*

and many others. The area is very vulnerable to the impact of grazing.

**The pastures of the alpine area** are areas of a special importance because most of the alpine flora species, i.e. *Gentiana, Potentilla, Pulsatilla*,

edelweiss (

*Leontopodium alpinum*

) and others can be found here.

**The limit area between the cliff area and the alpine pastures** is another area of special interest, where the rose bay (

*Rhododendron kotschii*

) and dwarf pine (

*Pinus mugo*

) can be found. The dwarf pine (a protected species in Romania) is widely spread over the steep slopes of Retezat, and supports the detritus. The European pine (

*Pinus cembra*

), a rare species, appears in larger and more compact groups than in other massifs.

The species of trees and bushes are given in Chapter 2.3.3. Habitats.

The sheep grazing represents the biggest threat to the flora of Retezat National Park. The characteristic species in the alpine pastures are gradually replaced, especially as a result of excessive grazing, with adventive species, respectively with less sensitive species (*Nardus stricta*, for example).

## **Fauna**

In the second half of the 19th century, Bieltz and Csato carried out the first scientific studies on the fauna of Retezat.. During the next century, many researchers studied the fauna of the massif.

Due to its very diverse habitats, , Retezat National Park shelters a particularly rich fauna, in number of species and population.

**The invertebrates**, represented by **thousands of species** from all the Carpathian habitatshave not been categorized, although they were studied a lot.

□

Most of the endemic **animals** in Retezat are among the invertebrates; 9 endemic species of day butterflies, 6 endemic species of plecopterans and 4 species of trichopterans have been so far identified. The last two groups are particularly associated to the major riverine systems in the alpine area. The inferior worms (nematode) have been well studied, more than 143 species are found in this area (including 8 endemites).

Some genres, like *Erebia* (the *Lepidoptera* order), for example, have a high specific diversity in this area. Thus, this genre,

gl

**acial relic,**

has an altitudinal spread similar to the latitudinal spread the genre has in the Northern Hemisphere.

As recognition of the importance of butterfly conservation in Retezat, Lunca Berhinei has been declared **Area of European Lepidopterous Importance**.

Extending the efforts of the researchers in the past years, the flora and fauna inventory program, part of the “Romanian Biodiversity Management and Conservation”, which started in 2000, has provided new information on the invertebrates in the Park every year, including the discovery of **new species in Romania**.

**All the classes of vertebrates** living in Romania are represented in the Park.

Among the **cyclostomes**, *Eudontomyzon danfordi*, one of the three species of agnates, can be found in the rivers; its presence is additional proof of the water quality in Retezat. The species has become

**rare** and recorded

in Annex II to the 92/43/EEC Directive on conservation of natural habitats, flora and wild fauna and in Annex III to Law 462/2001 on conditions of protected natural areas, conservation of natural habitats, flora and wild fauna, annexes that contain

**plant and animal species that require the designation of special conservation areas**

**The fish** are represented by 11 species, *Sabanajewia aurata* being one of them, which is **an endemic species in the Danube area** and listed

**in Annex III to Law 462/2001.**

In the 60s and 70s of the last century, some of the lakes in the Retezat National Park were populated with lake trout, *Salmo trutta lacustris*, a non-indigenous species brought in from the Alps. The researchers found this species to be one of the key factors that caused the amphibian populations, which use the glacial lakes as breeding grounds, to diminish.

More than a half of the Romanian **amphibian** species totaling 11, can be found in Retezat.

The specialists consider **8 of these species as rare and vulnerable**, at the national level. All these species are recorded in Annex II, regarding the strict protected fauna species (4 species) and Annex III regarding the protected fauna species (7 species) at the Convention on the conservation of European wildlife and natural habitats, adopted at Bern and ratified by Romania through Law 13/1993. One of these species is also recorded in Annex II, another species in Annexes II and IV, three species in Annex IV and one in Annex V to the 92/43/EEC Directive. According to

**Law 462/2001**

, 3 park species are recorded in Annex III, 2 in Annexes III and IV, one in Annex IV and one in

Annex V. This proves the vulnerability of these species and the need of special conservation measures for them.

The subspecies *ampelensis* of the common triton, *Triturus vulgaris*, was also found in Retezat; the subspecies is considered to be endemic to the Carpathians and a priority subspecies, being recorded in Annex III to Law 462/2001.

The red mountain frog *Rana temporaria* is consumed in some localities in the Park area, many of them, mostly females, are collected during the reproduction period.

**The reptiles** in the park are represented by 9 species, almost 40% of the Romanian terrestrial reptiles. Although just one species is considered rare at the national level, six of them are considered vulnerable. The Bern Convention includes all the reptiles from Retezat in its Annexes- II (4 species) and III (5 species)- and the 92/43/EEC Directive ensures the statute of species necessitating strict protection for 5 species in Retezat, including them in Annex IV. 6 of the Park species are also included in Annex IV, regarding strict protected species, to Law 462/2001.

Although few cases of viper bites have been recorded, tourists and natives often kill vipers.

The number of **bird** species in the park is large for a mountain area (Annex 2.3.1.). There are **185 species**, half of the Romanian bird species. 122 of them nest in the Park and nearby areas.

Rare species like the mountain aquila, *Aquila chrysaetos*, (also represented on the Park logo), Lesser spotted eagle, *Aquila pomarina*, the serpent eagle (*Circaetus gallicus*), the migratory falcon (*Falco peregrinus*), the mountain cock (*Tetrao urogallus*), *Bubo bubo*, *Glaucidium passerinum*, the black stork (*Ciconia nigra*) and other rare species can be found here.

With regard to their statute, Law 462/2001 includes 28 species in Annex III, 15 species in Annexes III and IV and 101 species in Annex IV. 127 of the Retezat and nearby areas species are included in Annex II of the Bern Convention and 50 are included in Annex III of the same Convention. The European Council 79/409/EEC Directive on the conservation of the wild birds includes in its annexes 55 species of birds living in the area.

**55 species of mammals**, 23% of the European terrestrial mammals, have been recorded in the Retezat National Park, proving once again the diversity of the natural habitats of this area.

The Park offers survival conditions to the most important European big carnivores: the wolf (*Canis lupus*), bear (*Ursus arctos*) and lynx (*Lynx lynx*).

). Big herbivores such as chamois (

*Rupicapra rupicapra*

), deer (

*Cervus elaphus*)

and the roedeer (

*Capreolus capreolus*)

can also be found here. The smaller carnivores, such as wildcat (

*Felis silvestris*)

and mustelines find micro mammals in the different habitats of the Park, which provides them with food.

The bears use caves in Small Retezat during the wintertime and bats hibernate here , and also use them for sheltering during summer days. There have been 13 species of bats identified in the Park: *Rhinolophus ferrum-equinum*, *Vespertilio murinus* and *Pipistrelus pigmaeus*.

The otters *Lutra lutra* can be found in some of Retezat's rivers, using the rich fish resource as food.

In 1973 a team of scientists from the Romanian Academy- Comission of Natural Monuments **introduced**

, 20 alpine marmots which originated in the Austrian Alps. The marmots were released in the Gemele Lake basin and can now be found in all the glacial valleys and basins from under the Custurii Saddle to the Zanoaga Lake basin. The impact of this

**non- native species**

on the vegetation and soils is unknown.

According to Law 462/2001, 22 of the mammals in Retezat require strict protection, 9 of them are included in Annex III, 13 are of community interest; their exploitation is a concern in the management measures, being included in Annex 5 of the Law.

The rich fauna of the Retezat National Park proves once again the existence of natural habitats little affected by human activity.

## Habitats

The alpine and sub- alpine pastures , rocky regions, dwarf pine areas, alder tree areas, mountain leafy forests, boreal coniferous forests, aquatic habitats and river valley bushes represent the most important habitats for conservation in RNP.

Retezat is part of the Carpathian Eco- Region and is considered, through the World Wildlife Fund- WWF- *Global 200* Project, a severely threatened eco- region.

The habitats are associated with the altitude areas, but vegetation inversions can often be seen , such as the ones from the West Jiu Valley and the Stanuleti area.

**The forests** cover around 49% of the area. The prevailing species are the beech (*Fagus sylvatica*)

, the spruce fir (

*Picea abies*

), the dwarf pine (*Pinus mugo*), the European pine (

*Pinus cembra*

), the fir tree (

*Abies alba*

), the sycamore maple (

*Acer pseudoplatanus*

), the birch tree (

*Betula pendula*

), the alder tree (

*Alnus viridis*

), the elm tree (

*Ulmus glabra*

) and the rowan tree (

*Sorbus aucuparia*

).

The resinous forests, the beech forests and their mixture are the most prevailing forests. The beech forests are located between 800 and 1200m, the mixed forest between 1200 and 1400 and the spruce fir forest between 1400 and 1800 m.

The pristine and quasi - pristine forests total an area of over 4800 hectares and represent 26% of the forest at present time (Dr. Ing. Radu Stelian, Preliminary Inventory of the pristine and quasi - pristine forests in Retezat National Park and neighboring area, ARNP, 2002).

The forest's average limit is at 1800 m, but sometimes it is situated at 1900 m (on the sesele brook, for example).

The forests of Small Retezat are unique, taking into account the abiotic characteristics of the area (the calcareous substratum, low humidity and higher temperature etc.). **The alpine and sub- alpine pastures**

cover around 11% of the area of the Park at altitudes between 1700- 2300 m. Protected species can be found here, such as:

*Rhododendron kotschii*, *Gentiana acauli*, *G. punctata*,

*Soldanella*

, etc

**The detritus and cliff areas** cover a large area in Retezat, both in the granite? area and the calcareous area. The characteristic habitats are populated with few species; the saxicolous lichens, invertebrates (the saxicolous spiders), reptiles and birds can be mentioned.

**The dwarf tree areas** cover, according to the forest- pastoral planning data, around .... %, and are situated between the superior limit of the forest and up to 2000- 2200 m, covering the area between the spruce fir area and the alpine pastures . One can find, among the characteristic species to the dwarf pine area: the bilberry (

*Vaccinium myrtillus*), t

he cowberry (

*Vaccinium vitis-idaea*

),

*Homogyne alpina*

,

*Soldanella hungarica*

.

Retezat National Park has 3 categories of aquatic habitats with a total area of 40,4 hectares:

a. *lakes, pools, alpine and sub- alpine streams* : important populations of aquatic

invertebrates, fish and amphibians live here. Endemic species exist among some of the invertebrate groups (trichopterans and plecopterans). The latest studies show higher biodiversity in the Stanisoara and Galesul streams, comparative with the other valleys.

b. *the swamps with peat*; the ones at Zanoaga- Judele have been studied more and are of special interest from a palynologic point of view. c. *the Gura*

*Apele lake,*

on the western limit of the Park, is an artificial aquatic habitat formed by a dam, existing since 1984. There are no studies on the impact of the lake upon the neighboring areas, nor on the fauna and flora of the lake.