

DESCRIPTION AND PROTECTION STATUS OF MOUNT GRAMMOS (NORTHWEST GREECE)

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INTRODUCTION

Geographical elements of the area - Administration status

Grammos Mountain constitutes a massif located on the borders of Epiros, Macedonia and Albania. It is considered as the northern edge of Pindos peninsula. Having an altitudinal range between 600 m. to 2520 m. above sea level, it is the fourth higher mountain in Greece, after Olympus, Smolikas and Voras. It is characterized by the large number of peaks that exceed the altitudinal belt of 2000 m. In respect of this, Grammos is characterized by the particular great percentage of surface that surpass this altitude.

Grammos Mountain, spreads at SSE to the valley of Sarantaporos that constitutes the natural boundary separating Grammos from the massifs of Voion at the east and Smolikas at the south. A physical extension of mount Grammos at the north comprises Morava's massif in Albania. Further northwestern, Grammos gradually falls, through lower elevations, to Kastoria plain.

Two large rivers have their source in Grammos. Aliakmonas, which is the longer river of Greece and Sarantaporos, which is the main tributary of river Aoos.

The area of mount Grammos is administratively divided to the prefectures of Kastoria and Ioannina and to the constituencies of W. Macedonia and Epiros.

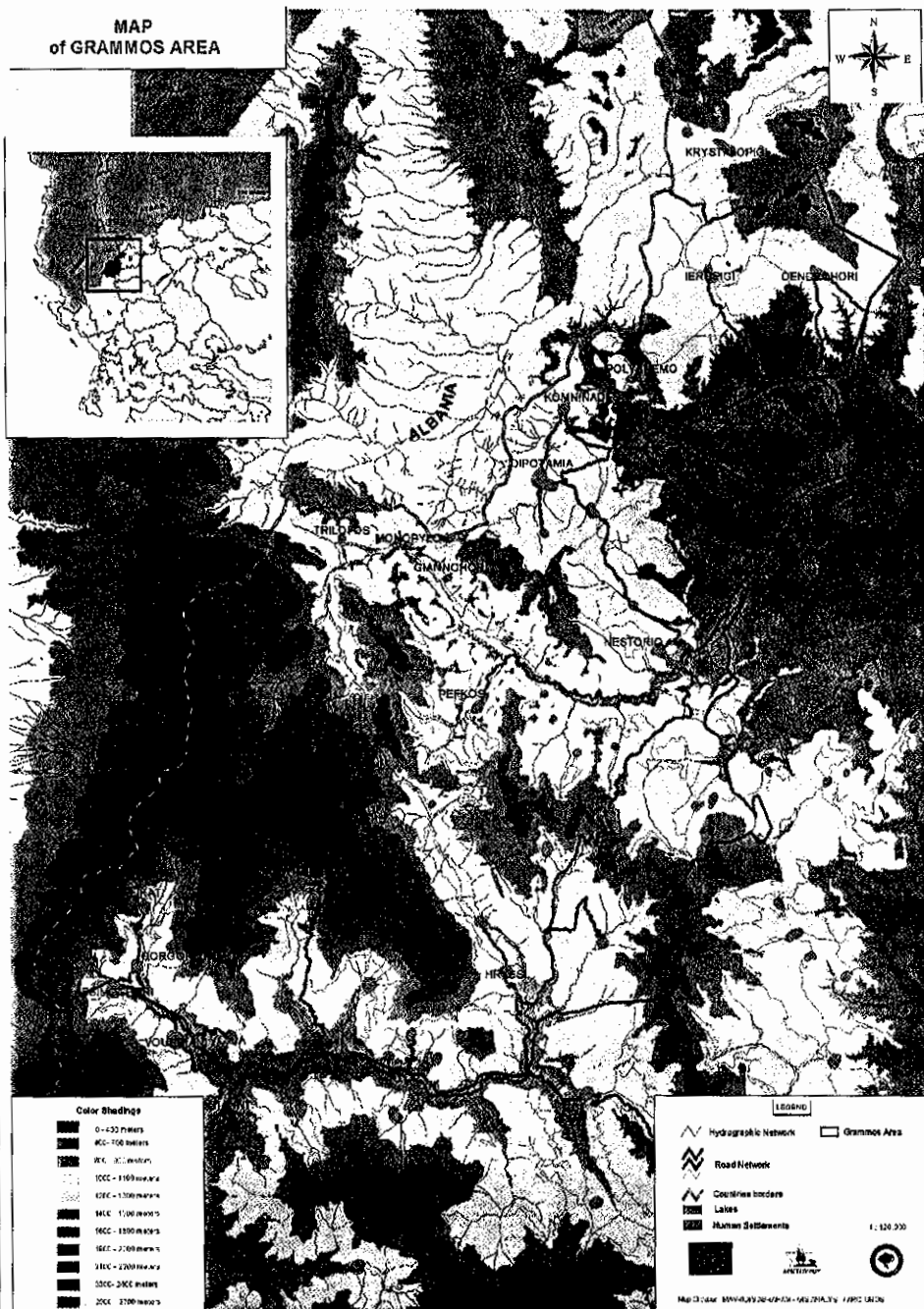
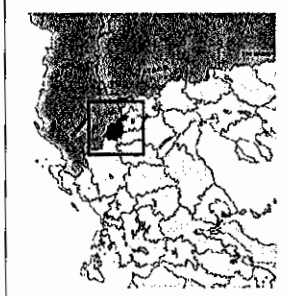
THE PROTECTION STATUS

Today, the following areas in Grammos have been enlisted in a specific protective legislation.

Nature Monument

It concerns the area of Barunga. It contains mixed forest consisting of beech, fir and Pallas's pine, of 130

MAP of GRAMMOS AREA



Map created by ARCTUROS GIS / Avraam Mavridis

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Geology

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hectares total extend. There has not been any silvicultural exploitation until today. It is included in the "Biogenetic Reserves" network of the Council of Europe.

Wild Life Resorts

1. Katafyki - Skala - Petra Megali, which extends to an area of 1100 hectares.
2. Arrenes, which extends to an area of 3200 hectares
3. Aliakmonas, which extends to an area of 1650 hectares

Data bases that present Grammos as a proposed protected area.

1. CORINE project. The area was included in the list because of the significant flora of the alpine and the sub alpine altitudes.
2. Important Bird Areas for Birds in Greece (IBA). The area was designated as important because of the existence of rare raptors and forest thriving species.
3. Important area for Bear in Greece (according to the Master Action Plan for the protection and management of the population and the biotope of brown bear in Greece). The area was described as important because of the suitability of the biotope and connection with the sub-populations of Morava, Florina and South Balkans.
4. NATURA 2000 Network (according to the 92/43 Directive). The area was enlisted in the network, because of the plant and animal species and the habitat types that contains.

THE NATURAL ENVIRONMENT

Geology

The dominant geological formations of mount Grammos, are Pindos flysch and ophiolitic complex.

The most frequent rocks resulting from these formations are sandstone, schist, slate, conglomerate and serpentine. Limestone appears in a great extend, as well. Also, quaternary formations comprising of scree, talus cones and alluvial deposits occur, especially on high elevations.

Climate

Grammos' climate is characterized as humid continental. The climatic features of the area, result from the significant distance from the sea, and basically from the high altitude.

The mean annual temperature ranges between 8 and 12 C, according to the altitudinal belt. The lowest temperatures are recorded in January and the highest in August.

Annual precipitation varies between 800-2200 mm and increases following altitude increment. The months with the maximum precipitation records are November and December and the months with the lowest precipitation records are July and August.

Snowcover on the higher elevations may last 7-9 months of the year.

Vegetation

In the Grammos area according to the Horvat's South-eastern Europe classification of vegetation, the following vegetation zones can be distinguished.

At the lower altitudes of mount Grammos, as is the foothills to the sub-montane and montane, levels, the sub-Mediterranean type of vegetation prevails (*Quercetalia pubescentis*). Into the sub-mediterranean zone, two sub-zones appear. a) The sub-zone of the oakwoods (*Quercion frainetto*) that occupies the largest area, composed of mixed or pure stands of *Quercus pubescens*, *Quercus frainetto*, *Quercus cerris* and *Quercus petraea*. b) The sub-zone of mixed broadleaf (*Ostryo-Carpinion orientalis*) which occupies less area and usually appears as scrubby formations. The latter sub-zone comprises of mixed stands mainly of thermophilous broadleaf species as, *Carpinus orientalis*, *Sorbus torminalis*, *Quercus trojana*, *Fraxinus ornus*, *Acer obtusatum*, *Coryllus avellana* etc.

At the higher altitudes the beech zone appears (*Fagetalia*). Beech is the dominant tree here and this zone comprises entirely of beech and/or in some cases, fir forests. The sub-zone that is found on mount Grammos is *Fagion sylvaticae* in which pure stands of beech (*Fagetum sylvaticae*) and beech-fir mixed forests (*Abieti-Fagetum sylvaticae*) thrive.

Black pine (*Pinus nigra*) in Grammos occupies large area and extends to a notable altitudinal range. Black pine forests constitute a particular vegetation zone (*Pinetalia*) that appears at lower altitudes next to *Quercetalia pubescentis* and, also, higher, next to *Fagetalia*. In Grammos, black pine, very often, reaches the treeline.

The land expanded above the tree line, up to the highest peaks, comprises the alpine zone (*Astragalo-acantholimonetalia*), which constitutes of alpine grassland and formations of cushion heath. This zone shows very extended and uniform expansion in Grammos.

Habitat types

The habitat types that have been reported from Grammos are up to 26. Most of them are included in Annex I of the Habitats Directive (92/43). The habitat types 6230, 9180, 92E0 and 9536 are considered as priority types for the EU. The types that are not included in the Directive and the agricultural land are classified using the Corine biotopes manual.

- 3220 Alpine rivers and the herbaceous vegetation along their banks
- 3260 Floating vegetation of *Ranunculus* of rivers
- 4060 Alpine and subalpine heaths
- 4090 Endemic oro-Mediterranean heath with gorse
- 5130 *Juniperus communis* formations on calcareous heaths or grasslands
- 6170 Alpine calcareous grasslands
- 6230 Species rich *Nardus* grasslands
- 7230 x 72B0 Alkaline fens with large sedge communities
- 8140 Balkan scree
- 8210 Chasmophytic vegetation of calcareous rocky slopes
- 9110 *Luzulo-Fagetum* beech forests
- 9130 *Asperulo-Fagetum* beech forests
- 9140 Subalpine beech forests with *Acer* and *Rumex arifolius*
- 9180 *Tilio-Acerion* ravine forests
- 924A Balkanic thermophilous oak woods
- 9250 *Quercus trojana* woods
- 9260 Chestnut woods
- 9270 Hellenic beech forests with *Abies borisii-regis*
- 92A0 *Salix alba* and *Populus alba* galleries
- 92E0 Residual alluvial forests (*Alnion glutinosae-incanae*)
- 9536 Pallas's pine forests
- 9540 Mediterranean pine forests, with endemic Mesogean pines, including *Pinus mugo* and *Pinus leucodermis*
- 9110 x 9536 Beech forests with Pallas's pines
- 9270x 9536 Hellenic beech forests with *Abies borisii-regis* and Pallas's pines
- 44.123 (Corine) Balkanic willow scrub
- 82.3 (Corine) Extensive small-scale cultivation

Flora

The recorded flora of Grammos massif contains 650 taxa (species and subspecies) ranked in 79 families. A thorough floristic inventory is estimated to produce a list of totally more than 900 taxa.

In the checklist, many central European floristic elements are included, as well as many taxa endemic of the Balkan Peninsula.

In particular, on Grammos massif, 163 taxa are characterized as Balkan or sub-Balkan endemics. Also, the following 18 taxa are recorded as endemics in Greece, the majority of them confined to Macedonia and Epiros.

Silene parnassica
Silene haussknechtii
Alyssum heldreichii
Aurinia gioniae
Sedum tymphaeum
Trifolium parnassi
Peucedanum stridii
Onosma pygmaeum
Rindera graeca
Verbascum epixanthium
Galium monsterium
Plantago atrata ssp. *graeca*
Crepis guioliana
Hieracium ferdinardi-coburgi
Fritillaria epirotica
Poa ophiolithica
Dactylorhiza baumanniana
Ophrys sphegodes ssp. *helenae*

3 taxa are recorded as local endemics, known to grow only on Grammos.

Thesium vlachorum
Ligusticum rhizomaticum
Solenanthes albanicus

In addition, 55 taxa found in Grammos are designated as important because they are included in checklists documenting their conservation status or their legal protection like the CITES convention, European Red List, 92/43 Directive, CORINE database etc.

Fauna

Mammals

3 species of insectivorous and 5 species of rodents, mainly confined to the forest habitat, have been recorded until now. Also, six species of bats have been recorded.

The most important of the rest are hare (*Lepus europaeus*) wild boar (*Sus scrofa*) roe deer (*Capreolus capreolus*) and chamois (*Rupicapra rupicapra balcanica*). The population status of these species is

generally better than in other mountainous areas in Greece. In particular, chamois presents a population of about 40 individuals, distributed over the village Plikati and on Soufliakas ridge.

Referring to carnivores, 8 species are recorded : Fox (*Vulpes vulpes*), Weasel (*Mustela nivalis*), Beech marten (*Martes foina*), Badger (*Meles meles*), Wild cat (*Felis sylvestris*), Otter (*Lutra lutra*), Wolf (*Canis lupus*) and Brown bear (*Ursus arctos*).

Otter inhabits the rivers Aliakmonas and Sarantaporos. Its presence has been traced from tracks and trails found inside and close the riverbed.

Wolf according to the ARCTUROS' LIFE-Nature project LYCOS (1998-2001) is resident in Grammos area. Appearances of wolves and damages on herds are reported every year.

Brown bear in Grammos has a constant presence, having a population of 20 to 30 individuals, as the inventory of the ARCTUROS' ARKTOS I and ARKTOS II projects resulted.

The presence of the animal seems to be pronounced on the north section of the massif, due to the better condition of the biotope in this area. Grammos population is in contact with the population of Prespa at the north and the population of Morava, which composes an extension of Grammos in Albania.

Birds

The avifauna of the area, especially of the forest habitats, is still under investigation. Until today, 142 species have been recorded in Grammos and the neighbouring area, 118 of them nesting. The most important and threatened species, included in the most of the protection lists and databases, are the following.

Black stork (*Ciconia nigra*), egyptian vulture (*Neophron percnopterus*), griffon vulture (*Gyps fulvus*), short-toed eagle (*Circaetus gallicus*), golden eagle (*Aquila chrysaetos*), Montagu's harrier (*Circus pygargus*), booted eagle (*Hieraetus pennatus*), peregrine (*Falco peregrinus*), hazelhen (*Bonasia bonasia*), black grouse (*Tetrao tetrix*), capercaillie (*Tetrao urogallus*), rock partridge (*Alectoris graeca*), grey partridge (*Perdix perdix*), stock dove (*Columba oenas*), eagle owl (*Bubo bubo*), Tengmalm's owl (*Aegolius funereus*), nightjar (*Caprimulgus europaeus*), wryneck (*Jynx torquilla*), the woodpeckers *Picus canus*, *Dryocopus martius*, *Dendrocopos medius*, *Dendrocopos leucotos*, rock thrush (*Monticola saxatilis*), chough (*Phyrrhocorax phyrrhocorax*), the flycatchers *Ficedula parva* and *Ficedula semitorquata* and barred warbler (*Sylvia nisoria*).

Amphibians and reptiles

11 species of amphibians are recorded in Grammos Mountain. Among them *Triturus cristatus* which is one of the most rare and threatened amphibians in Europe and is included in Annex II of 92/43 EEC Directive. 18 species of reptiles are recorded from the area of Grammos. Here, the northeuropean species *Lacerta agilis* and *Vipera berus* find their southern limit. The presence of northeuropean species, emphasizes the continental character of the area.

HUMAN ENVIRONMENT

Settlements and architecture

The settlements of the area in and around Grammos Mountain are up to 34. Seven of them are abandoned and not inhabited by people, nowadays. Many of the others are inhabited only during the summer period.

The majority of the villages are built in the altitude between 600 and 1000 meters into the zone of *Quercus* forests. The villages Grammosta and Aetomelitsa are located at elevations of more than 1200 meters.

The architectural values of the settlements are quite significant. The old buildings are made of stone and especially in the villages of Sarantaporos, ought to the indigenous craftsmen, the typical traditional architectural style that is found in Epiros, is dominant. Rock is still nowadays the main building material. Wood, though there is plenty in the area, is not used as in former times, as modern materials take over. The same happens with slate that was in the past, used for the construction of the roofs. Churches, big and small ones and also monasteries, constitute important architectural elements. Many of the villages have a great number of churches, a fact that indicates the religiousness of the traditional societies.

Watermills, water saws, fountains, springs compose notable human-made elements of the countryside, wherever the water is prominent.



Historical monuments are spread in the area the last decades reminding the history and especially the wars that took place in the region.

Demography

The demography of the area is typical of every montane and isolated area of Greece during the last decades. The population from above 16.000 inhabitants just before the Second World War dropped to below 5.000 during the last (1990-2000) decade. The municipal of Nestorio with 1.928 inhabitants constitutes the central of the area and includes the larger settlement.

The basic demographic problem is the high percentage of the elderly population and the serious reduction of young population groups.

Land use

Forestry is the dominant land use due to the montane character of the land. Forests compose slightly more than 50% of the total landcover. Pastures on the other hand come at the second place covering 44% of the area, extending mainly in the alpine zone. Agricultural land covers about 3% of the area while the rest constitutes barren land, rocky terrain and civil infrastructure. According to the data of the National Forest Service, 48,4% of the area is under forest exploitation and 36,4% are exploited for animal husbandry. Conflicts and problems related to the land uses are the following.

- Uncontrolled grazing and grazing into the forest stands. Also, overgrazing is happening in certain sites, especially in the summer due to transhumance. In some cases overgrazing becomes competitive for the wild ungulates.
- Forest road network. It appears over-expanded and in certain cases its density surpasses the real needs. It has become easy to trespass to critical and sensitive sites for the wild flora and fauna.
- Uncontrolled garbage disposal. It is carried out in the vicinity of the villages without any particular schedule or management.
- The mined areas in the prefecture of Kastoria that last from the civil war. Although minesweeping has result to reduction of the "dangerous" areas and the majority of them is known, mines still pose a serious problem for the ultimate management of Grammos. Another problem for the management is the military activation in the area and the presence of the army. At the moment it is essential due to the severe phenomenon of mass illegal migration from Albania.

Economic activities

In the **primary production** the dominant activities are animal husbandry and forest exploitation. Agriculture almost does not exist on montane villages but in submontane villages is an important economic activity. A characteristic of the last decade is the occupation of Albanian emigrants to the rural activities as well as to constructing ones.

The ploughing cultivation is the most extensive and is located at the most at the submontane zone, north of the massif. Garden cultivation covers small surface and is located in the settlements. Orchards do not appear regularly but in the form of dispersed trees. The commonest are apple trees followed by walnuts, hazelnuts, pears and cherry trees. A small surface that doesn't exceed 2,5 hectares is cultivated as vineyards.

Animal husbandry appears at the months from May to October in the subalpine and the alpine zone and comprises of nomad's exploitations, which usually own over 500 animals. The nomads come from the regions of Preveza, Igoumenitsa and Thessalia and hire the pastures from the communities, for the summer period. The number of the nomadic goats and sheep is estimated to reach 32.000 while cattle does not exceed 2000. The most significant pastures of the area are of Grammosta, Arrenon-Souflika, Aetomelitsas and Giannohoriou.

Apiculture is a section of primary production that shows rising in the last years. The majority of the exploitations are located around settlements.

Forest exploitation consists the most important activity of primary production offering profits to the cooperative associations of the region and further more to a large percentage of the inhabitants. Forest exploitation of the area is regulated by the property status. The forests are discerned under private, state and community ownership. Their management is regulated by management plans that assess the annual production.

The only **secondary production** that practically exists in the area around Grammos is of manufacturing furs. This activity became very profitable for the local economy in the period 1966-1981. Nowadays it is still



profitable and has partly changed to manufacturing leather clothes. Another activity that should be mentioned in the wider region is mineral digging from quarries at the north.

The **tertiary production** includes activities and services related with trade, hotel accommodations, banking, insurance and tourism. Special attention should be paid to tourism because is the branch of all that provides the better abilities of development.

Tourism is very restricted in the region throughout the year. Exception to this is the River Party that organizes the municipal of Nestorio every year. In fact, it is a concert that lasts three days and takes place beside the banks of Aliakmonas near the village. River Party is promoted from the media in a national level and every year, more than 30.000 people are gathered in Nestorio during the musical events.

The rest of the year Grammos massif is occasionally visited or walked. Most of the rare visitors are hunters or have origins from the region. The main reasons for the low levels in tourist attraction are,

- The distance from the main urban centers. Thessaloniki is 250 km away and Athens 630 km.
- The fact that the area is a passage for illegal migration from Albania.
- Intense military presence
- The mines from the civil war
- The lack of special infrastructure
- The lack of promotion of the area
- The confinement of the tourist interest in the capitals of the prefectures, Ioannina and Kastoria.

Hunting is an activity connected with tourism and has become intense in the area in the last decades as the number of local hunters and the ones that come from other regions is high. The game that basically interests the hunters is wild boar, hare, dove and partridge. Poaching is very often due to the lack of forestguards.

EVALUATION

Evaluating the most significant features of the natural environment, in general, the area presents:

- Extensive forest ecosystems with a high degree of diversity and naturalness that include significant habitat types. Some of the habitats, comprise priority types for the EU.
- Extensive and unbroken alpine zone with endemic flora and significant habitats.
- Prominent value for the flora
- High value for the brown bear and chamois.
- Prominent value for the avifauna, in particular raptors, forest species and alpine species.
- Prominent value for the amphibians and the reptiles
- Prominent value as a natural landscape

In addition to the natural environment and the wildlife features mentioned above, the area presents:

- Notable historical value.
- Ability of development environmental friendly procedures in agriculture, livestock raising and sylviculture.

- Significant tourist attraction for visitors interested in environmental friendly out-door activities and recreation. Also, provides the essential elements to develop ecotourism.

The features mentioned above are considered as adequate for the future sustainable development of the area.

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