



## **Economic- Geographical View of the Flora and Fauna: The Case Northeastern Montenegro**

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### **Abstract**

The paper presents economic and geographical view of the flora and fauna of northeastern Montenegro. The importance of forest vegetation, grass cover, anthropogenic vegetation cover, and the peculiarities of flora, fauna evaluation. In the absence of more detailed geographical survey of wildlife, it is difficult to talk about the fauna of the considered geographic space, as a whole. A little more detail, relevant and valuable for the evaluation in terms of human needs, we know about hunting fauna, terrestrial and aquatic ecosystems. Therefore, in the text the meaning of rated value of fish fauna and flora of hunting game, in terms of tourist and recreational needs.

**Keywords:** northeastern Montenegro, wild vegetation, grass cover, plant life, fish fauna, game species

### **Introduction**

Although the social need for geographical studies of flora and fauna of northeastern Montenegro is disputable, not on the planning position to meet its own current and other needs. In this respect far behind the European and evening boring countries. Positive examples of regional development, with well-defined strategy of development of natural resources, was recorded in the regions of Baden Württemberg in Germany, Lorraine in France, Westphalia in the UK, Veneto and Friuli in Italy, Slovenian arrests (Vojinović, Riznić, Borić, 2009). This development concepts practical, since it includes all who want to cooperate it

does not cost much and gives excellent economic results, which is of particular importance for under developed economic areas as what is after all the northeastern region of Montenegro. Starting the changes that make this part of northeastern Montenegro led to the inclusion in the modern system of economy, was the main motive of which I managed in geographical view of flora and fauna of the studied area. Starting from the classification of natural resources Dinića(1981) and Lujala (2003) we tried to find answers to many questions related to the geographic flora and fauna of northeastern Montenegro. So we founded our theoretical setting from which we start with the goal of defining and observing the flora and fauna in the context of its exploitation and use. Obviously, the flora and fauna can be from different aspects involved in the economic development of north-eastern Montenegro and can meet many needs of modern man, such as rest, gathering strength, walking, hanging out with friends, enjoy healthy food, cuisine, landscapes, etc. Today is increased, the demand for green destinations and protected natural areas, clean and free space, increasing demand for healthy food and environment. And it is this part of the northeastern Montenegro is an ecological oasis, not making good use of our stop port unity. The more than half of the, vegetables in the north-eastern part of Montenegro has an immediate wild relatives in our flora (wild lettuce, carrots, dandelion, garlic, nettles, sorrel, cabbage). There are wild species of fruit crops - wild pear, wild apple, cherry, hazel, dogwood, blackberry, raspberry, hazelnut, dog rose, hawthorn, blueberry, strawberry, which is a real treasure for tourism development. There are significant and honey plants (lime, acacia, lemon balm, thyme, mint, sage), and aromatic species (onion, juniper, basil, mint). The advantage of wild plants, in food occurs primarily in the fact that growing without pesticides, insecticides, fertilizers and chemicals, under optimal natural conditions. They are rich in bioactive compounds, are biologically more valuable, more resilient, have more vitamins, minerals, enzymes in the relationship, which is beneficial to our bodies. In the northeastern, part of Montenegro was reported about 60 species of medicinal plants, many of which are widespread and

protected from contamination (chamomile, nettle, thyme, linden, birch). Forest vegetation plays an important role in protecting public health and its beauty, and contributes to its aesthetic education, which is today in solving the environmental problems of particular importance. When it comes to hunting wild animals can arrange bird watching, photographing, fishing hunting ([www.maturskiradovi.net](http://www.maturskiradovi.net)). Of course, no matter how much natural wealth of flora and fauna of the northeastern part of Montenegro was great it is unlimited. Therefore, their use must be planned and rational. Thus confirm clearly formulated position Vasović and Biočanin (2007) "The current generation should create, yourself an appropriate quality of the environment, but this right must retain the next generation. In accordance with the concept of sustainable development is expected to work culture is based on humane principles of ecumenical environmental and social performance. Trends in environmentally justified our society is a compelling necessity, but also obligations".

### **Related work**

The problem of dealing with flora and fauna are: botanists, biologists, ecologists, economists, agronomists, sociologists, biologists, planners, historians and many other experts, which just shows that this issue deals and geographer - recognizing the fact that the geography of correlative science - science that successfully connects the research fields of natural and social sciences and in many areas of research have synthetic importance(Rajović,2007).

Dealing with the flora and fauna, many authors in their theoretical work, this complex natural process observed from several angles, either directly, or in the analysis of the overall socio-economic developments. It created a rich scientific base, the necessary orientation for further research.

In defining the objective of the paper we have taken the view that the flora and fauna of northeastern Montenegro, the example of the municipality of Berane, Andrijevića and Plav look in the context of their exploitation and use. A man

whose activity is a natural vegetation cover changed significantly, so we can talk about anthropogenic vegetation cover. In the above situation, it seems that every fundurani investigative work in the field of studying the flora and fauna, is welcome, therefore, believe that, in this context, and this modest contribution will be useful.

Searching sources of information, literature and the Internet, found the descriptions of similar studies and studies on the flora and fauna of Montenegro, the neighboring region, and developed European regions. Numerous studies have posed and successfully solve geographic questions about the importance of flora and fauna in the context of their exploitation and use, where they are using different methods of research. Far would lead us listing of such research, therefore, in this paper we limit only to the research carried out in Montenegro, or those relating to the flora and fauna of north-eastern Montenegro.

Famous botanists Pančić Lakušić, Blečić, Tatić in his works, the geography of interest: Pantoczek and Pančić (1873), Blečić (1953), Blečić and Tatić (1957), Lakušić (1968), Blečić and Lakušić (1970), among others describe new species for science floristic (*Wulfenia glecicii*, *Myricaria ernesti-mayeri*, *Valeriana braunii-blanqueti*, *Protoedraianthus maje*, *P.tarae*, *Edrianthus jugoslavicus*, *E.vesovicii*, *E.zogovicii*, *E.sutjeskae*), introduced a new, endemic, relict, medicines, bald, rare species of flora of Montenegro, which is an overview (Prodrumus) and description of new communities of science, whose main themes related to national parks north-eastern of Montenegro: Biogradska Gora, Prokletije as and potential objects of nature: Komove and canyons and gorges Lima and its tributaries.

On Komovi growing and large number of endemic species. A special decoration Ljubana, Štavne, the Carina and Margaret in late May and early June gives Violet (*Viola orphanidis* spp. *nicolai*) which is found and described Pantoček (1873) and gave her name to King Nikola. Koma rock mountains are covered with large floral smokehouse they found Josip Pancic back in 1875. There can be

encountered several types of "prkosnica", Pančić "kandilice", metal gray partridge, loggerhead milkweed, mountain ralnolist, lady's slipper, the Montenegrin milkweed. Economic aspects of evaluation of the wild game indicate the possibility for use for tourism purposes. This issue is dealing with: Knežević (1979), Jović and Vučković (1981), Knežević (1990), Kićović (1995), Rajović (2005), Marić (2010).

### **Research methodology**

Geographical study of flora and fauna in northeastern Montenegro until now little attention was paid to. Activities in this area are basically reduced to partial consideration of this issue at some scientific meetings and publications in the field of biology, tourism, agriculture and others. This research aims to meet the professional and the general public with the flora and fauna of northeastern Montenegro in the geographical context of its exploitation and use. Objective of this study it was possible to realize the combined use of different research methods. The core of the methodological procedure used in this paper makes the geographic (spatial) method. Specifically, parts of administrative-territorial belonging, northeastern Montenegro comprises three municipalities: Berane, Andrijevica and Plav. Application of statistical methods was necessary to define quantitative and qualitative characteristics of the research. Permitted through the entire text of the analytical method and, thanks to which we were able to identify, define and estimate the possible economic and social constraints of flora and fauna in terms of exploitation and use. Since work has essentially the synthetic character, the results published in the international literature. Among are opportunity to emphasize this: Wheater and Cullen (1997), Olaleye and Akinyemiyu (1999), Dana and Hipango (2011), Nyamekye A Samuel (2012).

### **Results and discussion**

Natural vegetation cover in terms of economy - agriculture has great economic and ecological significance. First, natural vegetation is a significant factor in nature in terms of its positive impact on the entire biosphere and the environment and purifies the air, improves the climate; enrich water bodies, preventing soil erosion and so on. Forest vegetation plays an important role in protecting the health of the population of the considered space, and its beauty, and contributes to its aesthetic education, which is today in solving the environmental problems of particular importance. Grass cover is significant potential for livestock development, since it has the best quality and cheapest fodder.

### **Economy land**

Forest vegetation in a vertical view of Montenegro, and the studied area, it is difficult to extract. This is primarily a consequence of climate and general environmental changes in the past (Tertiary, Pleistocene, Holocene) and natural plant communities in efforts to adapt to change and maintain (Blečić and Lakušić, 1970).

However we can say with certainty that the forest vegetation, this part of north-eastern Montenegro are: power crests offer unusually, mezzo crests offer unusually, based crests offer unusually and hero crests offer unusually forests, it is that the vertical terms area:

- The belt of alluvial flat Lima and its tributaries represented the hydrophilic forests of willow and poplar, alder and "hard blue forests",
- Oak forest belt extends to 1100 m above sea level is composed of oak forests and mezzo crests offer unusually forests of central European type, represented as a community of sessile oak and hornbeam.

The belt of beech and beech-fir forests, include four sub regions:

- mountain beech forest (at elevations between 700 and 900 m),

- mountain beech forest (mountain beech) (at an altitude between 1000-1300 m),
- Sub-alpine beech forest the higher altitude of 1800 m, dominated by spruce forests. With some mountainside stretch moliike high mountain forests and white bark pine, above which are represented by space based crest forest of red and white pine (Black and white pine). Some forest stands seems to dwarf pine, which exceeds 2000 m above sea level, or creeping pine, ends above 2200 m elevation (Radojičić, 1996).

In the zone of deciduous, mixed and coniferous forests, is most common, life meadows (belt of meadows) (between 1100 and 1500 m above sea level), and the highest area of mountains, covered with grass strip (grass strip). It spreads at different heights (the Cursed Mountains from 1900 to 2400 m above sea level) (Knežević, 1990).

Besides the zones forest vegetation types, depending, of local site conditions, vegetation types are represented, and the zones character. Some of these communities, such as poplar and willow edged along the mountain streams and up to 1000 m above sea level. Mountain beech forest degradation caused coppice forests and thickets where the profuse growth of hazel and birch.

Currently increases the need for multifunctional use of forests (production and general useful and special functions). Therefore, it is very important, knowledge of the state forest fund.

To view the status of forest reserves in the north-eastern part of Montenegro, are used in official statistics - a list of forest reserves in 1979, growing stock in 2000, data Kalezić (1976), data Shaw, cadastre, the Regional Business Centre in Berane (2004) and the like. However, data on the surface from different sources disagree. The probable reason is the fact that current state forest fund of the considered space, not enough is available to the experts or by their confidence

expressed some reservations, however ill changes associated with an area of forest reserves.

For the assessment of forests as natural resources and conditions used by various quantitative and qualitative indicators: forest area (forest cover), the structure of forest stands, timber volume, the volume annual increment, the quality of the felled timber and so on.

The main parameter to evaluate the value of forest cover is the degree of forest cover. Forgetting understanding of the extent of forest cover northeastern Montenegro, will use data from 1979 and 2000. Due to the ongoing list of forest stands and changes in the ownership structure of forest land shall be made at the request of the owner, or by examining the actual situation on the ground by police officer. According to the 1979 census of forests, forests occupy 63,718 ha, which means that 42.87 % of the territory of the considered area covered with forest vegetation (Table 1). According to statistics from 2000, forest area as compared to 1979, decreased by 1286.29 ha (forest area 62,432 ha, and the degree of forest cover 42.02 %). The reduction of forest areas are the result of not planning ways of management, lack of timely measures for protection against erosion of fire, etc.

Observed by breeding categories, dominated by regulated (high, low and safety) of the forest. Namely, the total area under forests in the northeastern part of Montenegro decorated wood waste 85.76% (54,643 ha), and the disordered 14.24% (9075 ha). The total density estimated to be 13,882,516 m<sup>3</sup>, i.e. 82.92 % (Table 1). The landscaped is 11,515,192 m<sup>3</sup> or 82.95 % of the total timber weight, and disordered 2,367,324 m<sup>3</sup> (17.05 % of the timber).

Table 1 Surface and structure of forest reserves in 1979

Forest stands	Area in ha	%	Timber in m <sup>3</sup>	%	Annual increment in m <sup>3</sup>	Annual increment in m <sup>3</sup> / ha
Edited	54.643	85,76	11.515.192	82,95	208.721	1,81
Unfurnished	9.075	14,24	2.367.324	17,05	31.193	1,31
TOTAL	63.718	100	13.882.516	100	239.914	3,12

Source: Republican Statistical Office of Montenegro, List of forest reserves in 1979 Edition of "Study and Analysis", Titograd, 1983. Edition" Studies and Analyses"

Annual increment of wood is 239,914 m<sup>3</sup>. It is increment in well-kept forests 208,721 m<sup>3</sup>, while in disordered is 31,193 m<sup>3</sup>. The average value of the annual growth rate was relatively small, amounting to 3.12 m<sup>3</sup> / ha, maintained forests - 1.81 m<sup>3</sup> / ha, unfurnished -1.3 m<sup>3</sup> / ha.

Table 2 Structure of forests in 2000

Surface	ha	%
High economic forest	27.196,24	43,56
Low economic forest	2.657,17	4,26
Protective forests	17.972,64	28,80
Uncultivated land	7.742,19	12,40
Bushes and shrubbery	6.858,05	10,98
TOTAL	62.432,29	100,0

Source: Republican Statistical Office of Montenegro (corresponding years)

The structure of forest najrasprostanjenije are economic forests affect 27,196.24 hectares or 43.56%, low economic forest 2657.17 hectares or 4.26%, protective 17,972.64 hectares or 28.80%, fallow land 7742.19 hectares or 12.40% and scrub and scrub 6858.05 hectares or 10.98%. According to statistics of the growing

stock from 2000 indicate a gross weight of timber harvest was 76,873 m<sup>3</sup>, of which the deciduous trees was accounted for 25,122 m<sup>3</sup> and 51,751 m<sup>3</sup> of coniferous trees. Of the total harvest of technical wood accounted for 53,474 m<sup>3</sup>, 13,525 m<sup>3</sup> of firewood and scrap 9824 m<sup>3</sup>. Annual increment of forests estimated 190,934 m<sup>3</sup>. Thus, the volume of cut is less than the increment.

To forest vegetation played an appropriate role in economic development, it is necessary in the future to pay special attention to the preservation and reproduction of forest reserves, especially of high economic and protective forests. This implies the rational use of, the reconstruction of devastated forests and extensive planting of trees, especially the field who are exposed to erosive processes. Careful cutting plan, taking into account the environmental and economic criteria.

Wood processing industry in the north-eastern part of Montenegro, one must pay special attention. Specifically, based on the use of forest wealth, this industry is, so far, its development directed to finalize the primary production (lumber, wood panels, etc.). The main goal of wood processing, must be defined production function, ie. sourcing products from the forest, which can be rescaled through dendromase production and other forest products. In addition, as the main forest product occurs virgin wood, whether in unprocessed (logs, firewood, construction wood) or processed form (furniture, cellulose). Other products include some of the woods, which are getting more and more important: game, fish, snails, wild fruits and seeds, mushrooms, resins, essential oils, juices, roots, leaves, lichens, moss, peat, stone, gravel, sand and ... ., for which there is no ban on the collection.

Before a hundred years and more livestock in large part rested on the use of forest products as an energy food, primarily oak, beech acorns and wild fruit and chestnut. Today is of this type of livestock feeding, the rest mostly just memories.

It is worth to remember about nutritional value of some wild fruits, which we sometimes lie useless, and within reach of the hand.

Acorns beech (*Fagus silvatica*), the nutrient value, almost equal, corn. It is most suitable for feeding pigs and influence to obtain soft and spreadable bacon, but it is very tasty. And fat obtained from pigs fed this way is almost liquid. Beech acorns are used to, ruminants (cattle, sheep, goats) (Ilić,2010). Besides the beech in animal nutrition, its application may have oak acorns (*Quercus* spp.). One acre of oak forest provides up to 4,000 kg of acorn, which corresponds to the amount of 1,800 kg of oats. By its food value is slightly weaker, with beech acorns, and, most similar to oats is mediocre, but has more fiber and less protein. It is used primarily in swine nutrition, but in smaller quantities, it can give cattle, sheep and goats and even horses, if it is fresh and prekrupljen. Adult pigs can eat about three kg of fresh, ie, about 1.5 kg of dry acorns, a day. Sheep and goats and 1.5 kg, and the horses and cows, to 3 pounds. Bacon and fat, the pigs, milk and butter from cows fed on acorns, are tough and not just the best taste (Ilić,2010).

Chestnut is the fruit of the wild (*Aesculus hippocastanum*) or chestnut (*Castanea sativa*). Given to cows-cows, which was gradually getting used to, and up to 5 kg per day, and beef cattle and up to 10 kg. I like horse chestnut, oak and beech acorn closing act, and must be combined with nutrients acting laxative, such as bran, fruit, root-tubers or molasses. Adult pigs, sheep and goats can be given up to 0.5 kg chestnuts a day, mixed with other feeds. Even the horses can get used to the chestnut, though far more difficult than other goods (Ilić, 2010).

Forests of the considered space is one of the most important natural ecosystems, which provide the basis for its sustainable development. North-eastern Montenegro is recognized as a tourist destination, for its beauty, which are unthinkable without the rich forest wealth. Forest belt is particularly interesting as a living space of venison, birds, fish and insects it is a pearl of the unique

natural beauty and unspoilt nature. With the tourism aspect has significant resources and potential for developing various forms of tourism such as hunting, fishing, adventure, adrenaline (Rajović, 2010).

Therefore, for the preservation of forests, is of paramount importance to prevent occurrence of adverse effects, especially fires during dry summer months. The negative impact of man, especially during long dry periods, there is an increased frequency of fire, which could cause immeasurable damage to forest resources and assets of the population ([www.e-turizam.com](http://www.e-turizam.com)).

If we start with the analysis of fire danger and all the elements affecting the process, the regional tourist information ([www.e-turizam.com](http://www.e-turizam.com)) north-eastern Montenegro can be divided into:

- increased fire risk area (coniferous) - the area municipalities: Berane, Andrijevica and Plav.
- area of moderate fire danger (oak, elm and other sawmills) - mountain resort municipality of Berane.

Prevention and fire fighting, should be an integral task of all stakeholders in forestry, as well as the general public. Starting from its responsibilities, the Ministry of Tourism and Protection of Montenegro, calls on citizens and many tourists that enjoy the natural beauty of forests considered space, respect and implement all safety precautions and careful handling, and thus contributing to effective protection and prevent occurrence of adverse effects, one of our most important natural resources.

In this sense, there are some conclusions:

- Forest condition in the subject area is such that allows permanent use of significant volumes of forest product range, as the basic raw material for industrial processing and meet the needs of the population in the wood (Various authors, 1989),

- The structure of forest significantly the share of degraded and devastated forests, which requires systematic and continuous professional Funded work on forest-breeding work, as well as plantation on land destined for forest crop production (Various authors, 1989),
- Scientific research is still insufficient preceded by numerous and various activities in forests and forest lands, which has a negative effect on the results and effects of the industry. Production function (through the provision of all the products from the forest and their evaluation) through the protective-regulatory (impact on climate, water regime, education, land, prevent erosion process, protection of buildings), the sanitary-hygiene (air filtration, neutralization of odors, noise reduction), recreational and health-tourism values (presence of many forest species, flora and fauna, natural rarity, varied relief), aesthetic-decorative-environmental features (landscape diversity, specific colors of paint, looks attractive fruits and flowers of various forest types), should be added and special functions (expressed through the socio-existential, cultural, function, preservation of natural rarities) (Krstić, 1998).

Featured assessment of forest vegetation in this part of north-eastern Montenegro, clearly indicate that it is necessary to implement several measures and activities to the modernization of the existing structure (organizational, production, personnel, etc.), Have created favorable conditions for a dynamic and versatile development of this activity and thus ensure a greater contribution of forestry to economic and social development of the studied area (Various authors,1989).For this purpose, the realization of important projects in forestry infrastrukturnih the studied area, the following projects: "Development of the Montenegrin Forestry", "Geographic Information Systems (GIS) in forestry" and "program of recovery and revitalization of river flows Lima"(Rajović, 2007 ).

Grass cover of the studied area, is diverse. His phytocoenological composition is conditioned by the complex action of local factors: geological, relief, microclimate,

soil type and moisture, and anthropogenic factors. According to the phytosociological composition and methods of use of grass cover can be divided, with meadows and pastures (Atanacković, 1982/83).

Meadows and pastures in the northeastern part of Montenegro, usually alternating with forest vegetations and agricultural areas. Meadow habitat are related to the deeper soil. In contrast, pastures are abundant in shallow soils and interrupted the circuit. Fertilizer use and improving the overgrown meadow, to prevent the spread of harmful and poor nutritional plants and thus increases the production of organic biomass and number of plants suitable for livestock. Extensive use of grassland in the past, had a negative impact on their phytocoenological composition. Zoogenic, mostly negative selection, have expanded the toxic and low-nutrient species, such as hellebore and tvrdača (Jovanović, 1990). Therefore, retrograde succession contributes to the spread of weeds and wild shrubbery. However, this vegetation plays an important role in protecting soil from erosion process.

Taking into account the habitat conditions and phytocoenological composition, grass cover this part of north-eastern Montenegro, can be divided into:

- lowland meadows in moist habitats,
- mountain meadows and pastures, mainly related belt of oak and beech forests and mountain pastures,
- mountain pastures, which reaches to the highest mountain tops (Lakušić, 1968).

Lowland meadows are mainly related to habitat of alluvial plains and relief of depression, along the major streams of Lima. Habitat conditions, especially soil properties and moisture, determine their floristic composition. Typical valley meadows meadows of wild barley and rare class blades (*Hordeo Caricetum*), meadow clover variety (*Trifolium resupinatum* balancas) and the hairy edge

(Cumosoro Caricetum hirtae) and so on. (Blečić, 1953, Randelović and Stamenković, 1983).

Mountain meadows and pastures are widespread in a belt of oak and beech forests. Flora composition of these grasslands, is caused by soil depth, slope, exposure side, so that in the considered area, reported a variety of pasture-meadow community. On the sites of oak and ash, and eroded the steep terrain, growing pasture communities (Astragali celamintheum Hungaricae). Mountain meadows and pastures are widespread in a belt of oak and beech forests. Commonly occur in the vicinity of settlements, alternating alternating with scrub community. Despite the presence of shrub and scrub communities, and weed-ruderal species, these grasslands are among the better, because the greatest amount of biomass are Trifolium (clover) species. Profuse mountain (mountain) meadows in the north-eastern part of Montenegro are full wigs and community "đipovine" (Festicio chrusopogonetum Grulla), so that the quality of hay from these meadows, reduced (Randelović and Stamenković, 1983).

Meadows of this type are widespread in the belt of oak forest, at an altitude of 1100 m. The highest quality meadow under this community, meet in the village Dapsiće, Navotine, basin Kraštica, Gradišnjica, Dolja, etc.. These meadows are usually hair in the first half of July, and then usually used as pastures. Meadow communities large "šilja" and yellow clover (Donthonio Trifolietum velenovski), is related to habitat oak and beech, and altitudes from 800 m to 1300 m above sea level.

The quality of hay from these meadows is good, but yields are very low (200 -300 kg / ha). With these meadows using cultural practices, the quality and quantity of biomass to a large extent, can be improved (Jovanović,1990). This meadow community is widespread in the basin Grnčara, Velička rivers, Zlorečica, Dapsićka rivers, etc..

Mountain pastures covers the area above 1100 m above sea level to 1500 m above sea level, a grass strip extends from 1900 m above sea level to 2400 m. The typical mountain pasture community board, wigs and hard grass (*Festuco Nardetum strictae*). For grazing sheep, pastures of this type are suitable in the spring when the tipac (*Nardus cricta*), is an herb. Dying of sheep and goats in this region, pastures of this type of win, a variety of bushes and weed communities.

Weed vegetation occurs in a number of species in agricultural areas, along boundaries and trails. Representatives are: Nettle (*Urtica dioica*), dandelion (*Taharacum officinale*), spurge (*Euphorbia cuparissias*), wild oats (*Avena dad*), mackerel (*Cirsium arvense*), Buttercup (*Ranunculus pepens*), burdock (*Lappa majok*), black mallow (*Malva silvestris*) and others. By combining mechanical, chemical and biological methods, can be suppressed weeds only in the course of a rotation crop rotation, and even during these, it recurred.

Ornamental plants are grown in gardens and yards. Often there are rosemary (*Rosmarinus officinalis*), iris (*Iris germanica*), Violet (*Viola odorata*), wild hyacinth (*Scilia bifolia*), snowdrop (*Galanthus nivalis*), lily of the valley (*Convallaria majalis*), sage (*Salvia officinalis*), sweet basil (*Ocimum basilicum*), rose (*Rosa*), selenium (selenium), Lilac (lilac), "angelic trulja" (*Burgmansia*) "plavuljak" (*Ceratostigma plumbaginoides*), mountain pine (*Pinus mugo*), maiden over (*Coreopsis grandiflora*), a plant hepatica (*Hepatica nobilis*) and others.

The composition of forest and grass community entered a large number of medicinal, aromatic, spicy, edible plants and mushrooms. Emphasizes the importance of medicinal plants, widespread in the north-eastern part of Montenegro, to the highest elevations. The prevalence of medicinal plants stand out: St. John's wort (*Hudericum pperforatum*), wormwood (*Artemisia onnua*), chamomile, basil, black mallow, plantain, Elder, dogwood, willow, nettle,

medicinal weeds, dandelion, parsley, juniper, wild strawberry (*Fragaria vesca*), dog rose (*Rosa canina*), blueberry etc.. In the studied area, registered about 60 medicinal plant species.

Most of them a prominent place in folk medicine, pharmaceutical production, which is very important for the tourism development. Medicinal plants rich in its diversity, physiological and pharmacological action, and a healthy quantity of raw materials, offers the possibilities of development health and educational tourism. From early spring to autumn at the latest, in meadows and pastures, the growth of many kinds macromycetes, among which are mostly edible and medicinal. Many of njh have the highest nutritional values. Do not forget herbs such as vervain, St. John's wort, thyme, wormwood, which are used as teas. Thanks to the widespread meadows and landscapes are varied and picturesque, which provides significant environmental and tourism value and is considered an attractive area. Meadows and pastures are covered with juicy mountain grass and meadow flowers, which give a special decorative landscape-value (Rajović and Rajović, 2010).

Collecting medicinal herbs and wild fruit, is one of the ways to increase the income of households and is performed by, mostly families. In this sense, organizations that deal with buying a small dedicated and in most cases no attention to education and information gatherers, with the consequence that the products of uneven quality, they can not achieve the sales price, at such a level which could, that the conducted even minimal measures, through various print and television information.

At harvest herbs, usually coinciding with the highest content of active ingredient in the organs of plants. Pick up: flower (Flos) soon as it starts to open, leaf (folium) when the plant begins to flower, upper part of plants in flower (herb) when the plant begins to flower, fruit (fruktus) at harvest depends on the type of plants, seeds (semen) fully mature, the bark (KORTEX) before CONVEYANCE

plants in early spring, underground organs of perennial herbs: rhizome (rhizoma), root (radix), tubers (tuber), bulbs (bulb) is removed in the autumn when fall foliage ([www.herbateka.com](http://www.herbateka.com)).

When picking wild herbs, collectors are usually adhere to the following rules: pick a sunny and dry weather, when there is no dew, remove all dirt and impurities, which decreases the quality of all, put skim plants without compacting in baskets, bags, boxes, leaving the best specimens of plants for only breeding; skim plants bear as soon as possible to dry, pick only one kind and not mix several types of plants. Air dry out in a thin, loose layer (several cm), usually on the boards, rugs, paper, in the shade and a draft. The length of drying depends on temperature and type of plant: 3 to 8 days leaves and flowers, 14 days fleshy roots ([www.herbateka.com](http://www.herbateka.com) ).

Artificial drying out in thermal dryers. Although they can be used for drying fruits and vegetables. Drying temperature: 35° to 40 ° C for aromatic plants and from 50° to 60 ° C for other medicinal plants. Packaging is done mostly in large and small sacks of paper, or in bags of multiple thick stock, ie, cardboard boxes. So that the packaging keeps plants from: moisture, oxygen from the air, which adversely effect coupled with high temperature and sunlight. For storing dried herbs are used, dry and promajna warehouse. It is essential that the premises is the relative humidity, below 60 % and a temperature lower than 25 ° C. The longest storage time is individual plants: chamomile flowers 2 years, gentian root, 5 years, marshmallow root, 2 years, 2 years of blueberries, flowers called 3 years, 2 years nettle leaf, linden flower 1 year ([www.moba.co.rs](http://www.moba.co.rs) ).

The importance of medicinal plants do not need further explanation, because we have witnessed increased use of various drugs and drug products based on natural herbs (Tucakov and Milojević and Mihajlov,1974:41-43). The problem of adequate collection and, in general, the entire treatment of medicinal plants in the northeastern part of Montenegro, will be solved by building a plant for

processing of medicinal plants in Andrijevica and Plav. Great wealth of medicinal plants and forest products can be used if the build and workshops for buying and primary processing in Berane.

Almost all enterprises in Berane, Andrijevica and Plav, were purchased herbs in small or large quantities and, above all, depending on specific requirements, which are submitted to customers and the financial ability to pay the redemption of plants (Pejić and Đerković, 1991). However, data on purchased quantities of mushrooms: porcini (*Boletus edulis*), chanterelle (*Cantharellus cibaris*), imperial mushroom (*Amanita Cesarea*), etc.. As on all other types of plants, no water, so it is impossible to track the amount by type.

Original (climax) forest vegetation in large areas destroyed by man, creating anthropogenic vegetation cover (agricultural cover) physiognomic, functional and structural, essentially different from natural.

Sentient transform natural cover in the north-eastern part of Montenegro, began late last century, but subsequent events (the Balkan Wars I and World War II) are strongly related to disordered original vegetation. Destruction of vegetation cover (forest) was carried out from the direction of the valley of Lima, that is. range of arable land, so its greatest degradation, related to the belt of oak and beech forests (Martinović, 1975).

Unlike other types of anthropogenic cover, agrarian cover, has a natural ability and historical regularities in the natural environment. Agricultural cover type is formed and functioning due to the interaction of, nature and man. However, using large amounts of energy and matter, the key functions in it, controlling man. Therefore, the stability of agricultural cover depends on the intensity of activities and specific needs of the people (Jacuhno and Pomelov, 1990).

Agricultural expansion at the expense of natural, lasted approximately 60 of the last century, when it consisted of 10,498 hectares or 15.49 % of the territory of

the considered space. Since then, agricultural cover is gradually reduced, to the early 90's of last century, consisted of 9,801 hectares or 14.40 % respectively, decreased by 697 ha. Reduction of areas under agricultural cover, not only contributed to the abandonment of arable land and orchards, but also contributes to its reduced and urban construction, construction of infrastructure facilities, roads and so on.

Today, the processes of land reclamation and pollution of the environment, more and more affected by agricultural land and ground water in rivers and lakes there is less of life, progress on land-vegetation degraded and impoverished regions devastated by erosion, some species disappear, and for many it is, threatening the viability of (Atanacković,1982/83). Therefore, agricultural cover the observed space is not homogeneous, but separated natural and other anthropogenic cover types (technical production, urban).

It is often relentlessly undermines the harmonious look of relief, particularly by building roads, exploitation of construction materials and mining. It is normal that during the construction of roads, the excess material collapses down the slopes. In several places (near Berane of mine "Ivangrad" Andrijevića in Žoljevice in Plav, above Gusinje), are also visible early in relief, made unplanned use of space. Unplanned made similar changes have been made around urban settlements Berane, Andrijevića and Plav, and certainly in this respect, the worst example, the use of gravel and sand bed of Lima, and mining coal in Berane basin, indicating that not enough care for the decorating and planning space (Radojčić, 1996).

Flood suffer the highest quality and most fertile lands of Berane, Andrijevića, Polimlje Valley and Plav-Gusinje basin. A particular problem is the erosion that affects all the river valleys and mountain slopes. Arable land in the bays, valleys and sinkholes, which is based on agriculture, is left to the degradation and erosion. The level of protection from erosion little has been done, primarily for

rehabilitation of flood, reforestation, land reclamation of pastures. Made small antierosional measures, but it takes a lot to be done especially in the upper, steeper part of the watershed Lima. Only by erosion, of the total area agricultural and forest land, according to the Municipal Secretariat for Economic Affairs, was attacked about eighty thousand acres.

Should pay attention to the uncontrolled and unplanned felling of trees in recent years (eg, cut down the poplar in Luge, an important timber resource and the defense of billowing Lima), which can cause activation of erosion in this part of the basin. Floods are the most vulnerable areas of alluvial plain in the immediate valley of Lima, with the exception of the sector in the relief flow constriction. Settlements that are located at the bottom of the depression to a greater extent are threatened by floods of torrential tributaries, flood wave than Lima. "Berane is one of the first municipalities in the north-eastern part of Montenegro, which has acceded to solve flooding problems in the urban area of Lima and to the construction of gabion protection. During the construction of fortifications on the shore of the river Bistrica and Budim" ([www.beranetown.net](http://www.beranetown.net) ).

Soil pollution from industrial facilities expressed phenomena. Almost all industrial facilities in the northeastern part of Montenegro, were built on agricultural land. Thus deprived of the best agricultural land, and with it brought the risk to be polluted industrial wastewater. Therefore, it is important to access the basic analysis of spatial and urban planning in the municipality of Berane, Andrijevica and Plav, regarding the need to protect agricultural land around urban settlements, industrial and construction facilities, as well as those soils, which are used for housing and other construction (Radojčić, 1996).

Recommended measures and works should not be allowed to bypass the forest areas, because many current forests caused erosion and rehabilitation of any disturbance of natural balance will again cause the intensification of erosion. For

forest areas, public and private, within the erosion area, provides a clear ban on felling and thinning of obligations and compliance planning documents for forest management.

Exploitation of medicinal and aromatic plants, must be planned, otherwise it can lead to extermination of many species. Particular attention should be paid to the degradation of mountain pastures and meadows as a result of unplanned and irrational grazing, fertilization, reduction of livestock, lack of quality grass species, and so on. The process of protection of flora, vegetation, animal life points out the need for raising awareness about the importance of plant life.

Pollution of the river Lima municipal water Berane, Andrijevica and Plav, indicates a need to take protective measures. Special treatment of groundwater abstraction. Privacy abyss of pollution, and soil through which water flows, has become a constant concern of the community and the individual. It is necessary to ensure protection of all wells and springs, whose waters are used for purposes of population and industry. Better protect the catchment facility supply urban areas, from possible contamination.

According to the Institute of Public Health, Podgorica (1995), air quality is in this north-eastern part of Montenegro is the new high for its clear, especially outside urban areas Berane, Andrijevica and Plav. By the quality of air, space considered, with the exception of Berane (second class, after the termination of the work of pulp factories), a zone of a first-class air quality.

The considered area is an area of outstanding natural beauty and special care must be given to, protection of nature. Bearing in mind that the problem of pollution and deterioration of environmental quality is negligible, protection and preservation of the environment, are important in terms of planning and taking account of the use and deployment of certain content. The considered area is an area of outstanding natural beauty and special care must be given to, protection of nature. Bearing in mind that the problem of pollution and deterioration of

environmental quality is negligible, protection and preservation of the environment, are important in terms of planning and taking account of the use and deployment of certain content.

### **Particulars of flora**

Flora of the considered space due to favorable climate and soil composition is lush and varied. Thus, in addition to representatives of Alpine, Central European and Mediterranean flora species are encountered and the Balkans and the autochthonous endemities (Knežević, 1979). For the appearance of the landscape, are of special importance biogeographic characteristics. They are shown as direct and indirect tourism value, ie. have significant recreational, aesthetic, health, exceptional endemic and famous tourist attraction properties. Combined with other interesting tourist values, plant life are beautiful decoration of this part of north-eastern Montenegro. Kićović (1995) rightly points out that Prokletije, Komovi and Bjelasica belong most interesting and most important vegetation areas in the country. However, little tourist traffic, poor communication. Have made to forest vegetation of the tourist value, only the complementarity with other tourist and recreational motives (Knežević, 1979). Thanks to the widespread forests, landscapes are varied and picturesque, which provides significant environmental and tourism value and is considered an attractive area. Forest belt is particularly interesting as a living space of venison, birds, fish and insects it is a pearl of the unique natural beauty and unspoiled nature. It is expected that the inclusion of the studied area into certain forms of nature protection, as well as its natural tourism development, influence to change current approach to evaluation of forest.

So will the forests be treated as a significant tourist and recreational development factor. The considered area is rich in valuable natural elements, which have not yet been placed under protection. The exception is, part of the national park Biogradska Gora and more recently Prokletije. Protected Zone

Biogradske Gore of 13,600 ha, 5.400 ha surrounding national park. The observed space, belongs to the eastern part of the park and includes the basins of the upper part of the river Bistrica. The composition of the reserve, located about ten forest communities, including beech and beech-fir boards (Faget/Aceretum Blečić et Lakušić, Aszneumo-Fagetum, moesicae Blečić et Lakušić, Abeeto-Fagetum moesiaca Blečić et Lakušić, Elum-Fagetum moesisae Blečić et Lakušić), with numerous and very rare representatives dendoflore (whose age of trees, ranging up to 450 years) (Lakušić and Blečić, 1970). Physiological functions, giving him motive recreational properties, and aesthetic and decorative, including the group of exceptional aesthetic and landscape motifs. Occupied almost, to the largest peaks of Mediterranean, Montenegrin, Euro-Siberian, Aral-Caspian, cosmopolitan and Balkan florine elements, from which many recommend extremely aesthetic and famous attributes great attractions: *Pinus heldreichii* Christ - bark pine, *Pinus peuce Gris* - molika, *Acer heldreichii* Orph. ssp. *visianii* (Nyman) Maly - "Visijanijev maple", *Ranunculus crenatus* WK - elevate buttercup, *pancicii Dianthus* - Carnation Pancic, *Viola elegantula* Schott - lovely violet, *Potentilla montenegrina* Pant .- Montenegrin tormentil, *Saxifraga contrasts* G. Beck - "Prenjska oysters", *Daphne blagayana* Frey. - "Jeremicak", *Pancicia serbica* Vis. - Serbian Pancicia, *Edraianthus jugoslavicus* Lakusic - bells, *Linum capitatum* Kit. - tee member *Wulfenia bleicii* Lakusic-Blečić "vulfenija", *Valeriana pancicii* Halacsy & Bald. - Pančićev valerian, *Lilium albanicum* Gris. Albanian-lily, *Achillea abrotanoides* Vis .- mountain yarrow, *Achillea lingulata* WK - language exchange yarrow, *Myricaria ernestii*-Mayer Lakusic ([www.nparkovi.co.me](http://www.nparkovi.co.me) ).

Legally protected species are endemic: *Adenophora lilifolia* - lily leaf bellflower, *Allium phthioticum* - Greek arch, *Aster alpinus* - alpine starry, *Daphne blagaiana* - "blagajev Jeremicak", *Eringyum alpinum* - "alpine kotrljan", *Gentiana lutea* - Gentian *Gentiana punctata* - spotted gentian, *Lycopodium alpinum* - alpine wormhole, *Myricaria Ernest-Mayer* - Mayer vresina,

Nartheicum scardicum - Sar Links Traffic, Orchis cordigera - "kaćunak", Pinguicula Balcanica - Balkan bruises, Saxifraga Federici - August - Federico saxifrage, Silene macrantha - red pucalin, and Taxus baccata - Yew, globeflower europeus - poplar, Valeriana pancicii - Pančić valerian, Wulfenia bleicii - Blečić vulfenija ([www.nparkovi.co.me](http://www.nparkovi.co.me) ).

What makes Prokletije recognizable even in European terms, it was their natural value and relatively well preserved natural environment, from pollution and degradation. Unique natural values and characteristics that do not exist on other mountains, not even in the existing four national parks of Montenegro (Durmitor, Bogradaska Gora, Lovćen, Skadar Lake), have an invaluable importance for science, culture, education, tourism and recreation. On Prokletije mountain peaks rise Bjelič, Zla Kolata (2534m), Good Kolata (2528m) and Maja Rosit (2524 m), which dominate the height. In natural conditions for development of summer-recreation and winter-sports tourism, especially at ski resources and development opportunities lake, environmental, sport fishing and other selected forms of mountain tourism, and the challenges of mountaineering and alpine terrain, Prokletije have no competition among the mountains of our country. Prokletije mountains are particularly unique for its geological diversity and biodiversity. Are characterized by specific morphostructures and morfoskulpturom, with particularly pronounced glacial, fluvial and karst forms of relief. Exceptional, aesthetic and spectacular features embossed mosaic Prokletije in the limestone zone geo-morphological complete various phenomena, such as very sharp peaks and ridges, deep hollows and vertical cut-out waves, limestone Spokes in the waves and canyon cuts through the bars (Vusalja, Grbaja and Grnčar Grlja ), windows in the rocks known as "hollow doors, gigantic moraine flanks," the sea of stones "and interesting profiles of rocky layers ([www.dmcmontenegro.me](http://www.dmcmontenegro.me)).

Specificity Prokletije among other things, lies in the properties of floristic composition of whitebark pine (*Pinus heldreichli*) and molikove forest (*Pinus*

puece), which is the area of Plav and Gusinje, down almost to 1400 m above sea level (although it was developed, mainly at an altitude of 1,800 to 2,000 m above sea level) and that the relict jungle type forests. Prokletije characterized by a large number of Balkan and Montenegrin-Albanian endemic and rare species (16) that represents exceptionally and aesthetically remarkable attributes (*Allium phtioticum* - species from the family of arcs, *Viola vilaensis* - a kind of violet, *Tulipa grisebachiana* - species tulips, etc..) (Blečić and Tatić, 1957).

Komovi Regional Park (east and northeast) currently includes 1,100 ha of hunting reserve. Spatial Plan of Montenegro and mountain recorded Turjak with Hajla, belonging to the considered area, except the extreme eastern side, which belongs to the River Ibar.

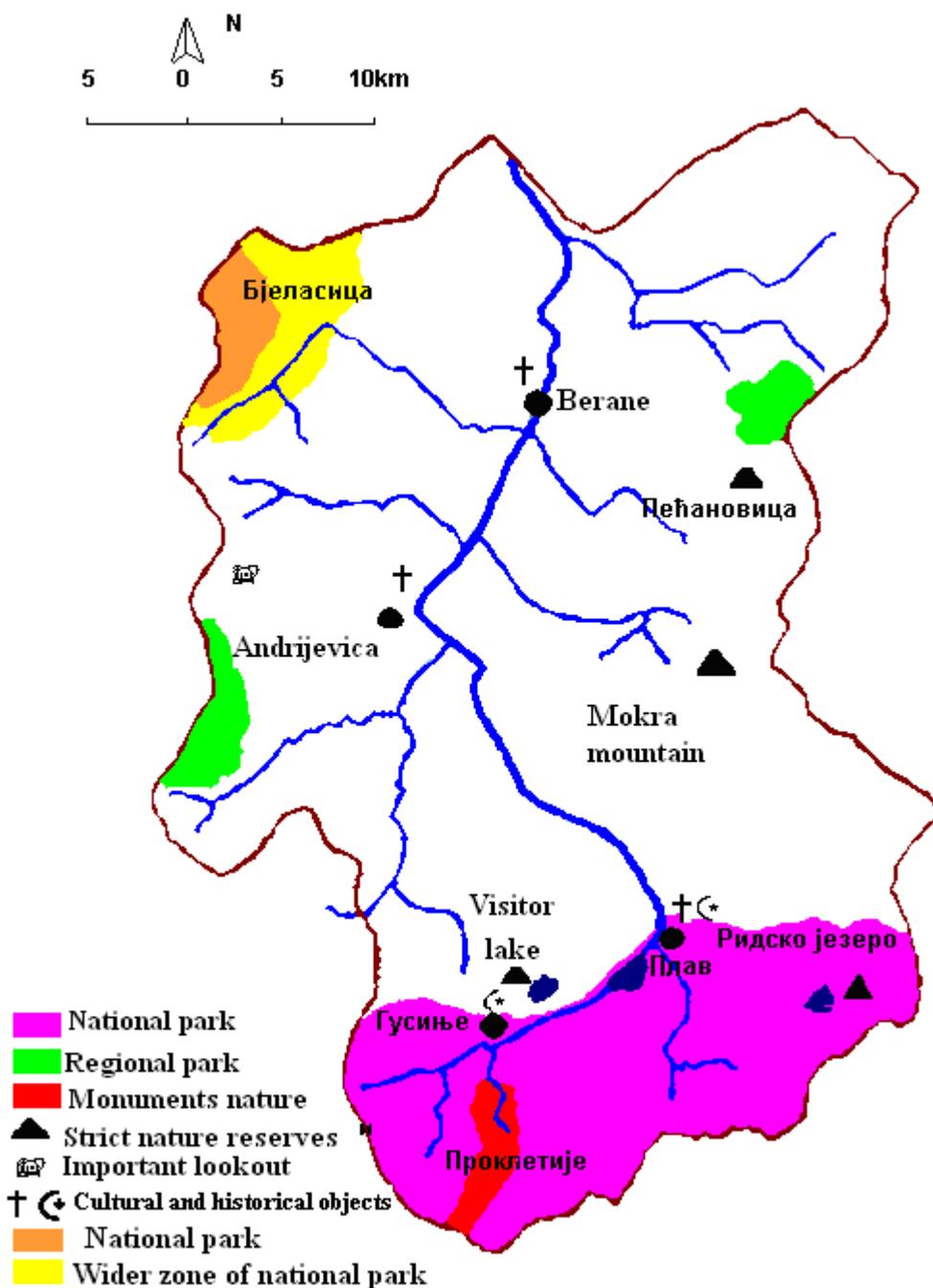
Grasslands on Komovi are spread by komskim boulders and reefs in the form of fabrics, turf terraces, stairs and ledges. Everywhere where there is erosion and smooth rocks are not high, in any Komovi a lot, grass band starts at about 1700 m above sea level and reaches to the tips of 2460 m. This rich vegetation includes communities of mountain buttercup (*Ranunculus*), and in particular crossed Buttercup (*Ranunculus hidridus*) and mountain buttercup (*Ranunculus montanus*), "klapakur" (*Ranunculus scutatus*), crosses (*Parisquadrifolia*) and other types of mountain thick juicy grass. On Ljuban, the scrapes, and especially the yellow poplar grows witches (*Trollius europaeus*), one of the most beautiful flowers of high mountains, which was in a folk song opevan. On scree Koma Christmas is kernerov poppy (*Papaver kernerii*), alpine Sunstroke (*Helianthemum slpestris*) "orfandisova" Violet (*Viola* clover (*Trifolium pallescens*) "alpine orphanidis), sneaking partridge (*Saxifraga oppositifolia*), pale clover (*Trifolium pallescens*) alpine Sunstroke (*Helianthemum slpestris*) "orfandisova" Violet (*Viola orphanidis*), sneaking partridge (*Saxifraga oppositifolia*), pale clover (*Trifolium pallescens*), "alpine grozničnica" (*Scutellaria alpina*), Albanian lily (*Lilium albanicum*), grass of uloma konstolom (*Narthecium scardicum*), marsh orchid (*Dactylorhiza cordigera*), cation Orchid (*Orchis*

sambucina) gencianolika Plantain (*Plantago gentianoides*) "Siparska" milfoil (*Alhillea abrotanoides*), alpine sasa (*Pulstatilla alpina*). Komovi rich diversity of medicinal herbs and wild fruit, and not without reason, botanists call the pharmacies in the open. One of the most popular plants is gentian (*Gentiana lutea*) and *Gentiana pavalekii*, grass of bowel (*Gentiana asclepiadea*), gentian, or "Kluzijev" gentian (*Gentiana clusii*), freckled Gentian (*Gentiana panchata*), yarrow or "Sporiš" (*Achillea millefolium*), St. John's wort (*Hypericum perforatum*), primrose (*Primula elatior*), the well-known herb mercury (mercury rising from the dead) (*Teucrium montanum*), "srčenjak" (*Poligonum bistrot*) and several species of valerian (*Valeriana officianalis*), then, Oregano, Hawthorn, mullein, and much "sremuš" other herbs ([www.komovi.com](http://www.komovi.com)).

On Komovi, growing and large number of endemic species. A special decoration Ljubana, Štavne, Carina and Margaret, makes its peak in late May and early June, Violet (*Viola orphanidis* spp. *nicolai*) which is found and described Pantoček 1873 and gave her name to King Nikola. Komske rocks are covered smokehouse, which was discovered by Joseph Pancic, back in 1875. There can be encountered several types of "prkosnica", Pančić "kandilice", metal gray partridge, loggerhead milkweed, mountain ralnolist, lady's slippers, Montenegro's milkweed. The rubble is glacial relicts herbaceous willow (*Salix herbacea*), wild carnation (*Dianthus silvester*), Nikola 'carnations and many other plant species ([www.komovi.com](http://www.komovi.com)).

In the north-eastern part of Montenegro, there are monuments that have not been protected as natural areas. It is primarily the river canyon Grlje, Skakavac waterfall, hot Oko, the sources of Gusinje, Rid and Visitor Lake, Nameless caves and caverns on Divjak (Knežević, 1990). Therefore some of these units should, be put under protection, natural resources of specific natural resources. The knowledge that these plant species participating in the floristic components of spatial units, suggesting the possibility of involvement of those same natural

resources in community care. After all, without protection of floristic species in the vegetation mosaic, the studied area, there is no real value as a tourist complex biogeographical motives tourism trends (Pantoczek and Pančić, 1873 and Pasunović, 1983).



Map 1 Existing and potential parks and nature areas in northeastern Montenegro, the example of the municipality of Berane, Andrijevica and Plav.

### **Particulars of fauna**

Animal world as an element of the environment which is an ingredient of various ecosystems, offers significant opportunities for economic evaluation. However, the physical-geographical studies, the animal world is not disputed considering in detail. Also, theoretical and methodological aspects of economic evaluation of this element of the environment, at least specifically elaborated (Dinić, 1978).

The theory of economic-geographical evaluation of a treatment of natural resources and natural conditions. As a natural source, the animal world but the direct use in human food, it can be seen as raw material for certain groups of food industry and leather industry.

The indirect impact of wildlife is the human activity and other elements of the environment are strongly expressed, although these relations are often hidden. Those men can be both positive and negative. For example, it is generally acknowledged importance of microorganisms for specific processes in the soil, the importance of insects for pollination of vegetation and the like. And on the other hand, is their damaging effect on crops (field damage that makes the game, adverse effects of animal life, as a carrier of many disease, etc.). (Dinić, 1978).

The most attractive form of modern usage of the animal world, related to tourism and recreational exploitation. Hunting and fishing, in the early stages of development of human society - the basic human activities have become one of the mass forms of human recreation. Values of evaluation criteria of the animal world in relation to this type of tourism are the most elaborate, particularly from the time of hunting tourism can make significant economic effects.

J. Dinić (1981) as basic parameters for evaluation of hunting game says the structure, number and distribution of wildlife, while the valuation of wildlife in aquatic ecosystems, benefits summary indicator zoomase.

The characteristic species of birds are sparrow (*Passer montanus* et), big tit (*Parus major*), blue tit (*Parus palustris*), black crows (*Cotvus corone*), Raven (*Corvus carah*), woodpecker (*Dendrocopos major*), black woodpecker (*Picus canus*) prugasgi Spotted Woodpecker (*Dendrocopos lilfordi*), starling (*Sturnus vulgaris*), wood pigeon (*Calumba palambus*) cuckoo (*Cuculus candrus*), quail (*Coturnih cot.*) partridge (*Perdih perdih*), owl, jay, and others.

The characteristic species of amphibians and reptiles are: forest frog (Agile frog), rows crosses (Green Toad), green frog (Edible frog), a frog grasslands (Common Frog), short lizard (Snake-eyed skink), forest gecko (lizard Meadow), Sand Lizard (Sand Lizard), lizard (Green Lizard), water snake (grass snake), Black salamander (salamander Alpine), a colorful lizard (Fire Salamanda) "dožddevnjak" (*Salamandra salamandra*), Newt (*Triturus cristatus*), Long-fingered Newt (Balkan crested newt), various kinds of snakes, and others (Arnold and Oveden, 2002).

World of insects is very diverse, although sparse due to the application of various agro-chemical means. Insect size varies and ranges from 0, 25 mm to 30 cm. Insects have enormous importance both in nature and for man, so it developed a special science, entomology, for their study. Only about 1% of all insects are pests that destroy plants grown man, destroying trees and spread diseases that affect humans and animals. Some species of insects carry pollen to pollinate the plants, some feed on harmful insects and some species even produce toxins that can destroy bacteria, for which man has not developed antibiotic ... It is important at this point, to emphasize the economic importance of some insects, eg. honey bees (*Apis melifere*) and bumblebees (*Bombus*) ([www.bionet-skola.com](http://www.bionet-skola.com)).

Honey bee of all the insects, most commonly visited flowers. It was found that compared to all other insects, bee visiting flowers are about 80%. To successfully performed pollination, is recommended to have 2-3 strong colonies, for each

hectare of orchard. The use of honey bee colonies, especially helpful for improving the fertilization in cases of explosive flowering. This flowering performance in almost all fruit species, when the prevailing high temperatures. Then the viability and functional capacity of the elements of current booming, and the presence of bees necessary. In modern beekeeping practice, worked out the procedures for the use of bees to increase the yield of the orchard. This is more of us are pioneering ventures, but they have not been represented so much to become a regular companion of modern fruit production ([www.poljoprivreda.info](http://www.poljoprivreda.info) ).

In vegetable production, more and more vegetable growers, who use the bees for pollination of flowers, instead of well-known hormones (ORTHOMONE) that are applied by hand or hand protresivanja flowers. Bumblebees and at relatively low temperatures (6 ° C) and windy conditions and cloudy weather continue with their activities, which is not the case with bees. The bees are reluctant to visit closed areas (greenhouses, etc.). However, bumblebees are active and outdoors, in greenhouses, and greenhouses, as well as in low tunnels. The advantages of using bumblebees in tomato production are: a fully fertilized tomato clusters, uniform fruit size in clusters, healthy, juicy and full of fruits, regular shape characteristic of the variety of fruits, which means increased yields, improved quality, greater weight, the higher costs and lighter fruit classification. The advantages of using bumble bees in pollination of peppers: larger diameter of the fruit stalk, fruit meatier, thicker walls, better reproduction of varieties susceptible to lack of light, regular shape characteristic of the variety, a number of first class fruits ([www.psss.rs](http://www.psss.rs) ).

It is obvious that the natural and anthropogenic phytocenoses the north-eastern part of Montenegro, inhabiting diverse fauna that form diverse ecosystems. However, it is not complete here studied. Broadly, studies were conducted only life cycles of individual zoocenoza. In the absence of further examination of the living world of the considered area, it is difficult to talk about the fauna of the

north-eastern part of Montenegro, as a whole. A little more detail, the relevant value judgments in terms of human needs, we know about the hunting of terrestrial fauna and aquatic ecosystems. We will therefore in the following, assessed value and meaning of the ichthyofauna fauna of wild game, in terms of tourism and recreational needs.

Aquatic ecosystems north-eastern Montenegro, inhabiting diverse fish fauna. In relation to a share of inland waters, which is customary when exercising in fishing, and published in numerous references of this kind, considered the water space, belong to the so-called water that are inhabited mostly fish from the trout family (Salmonidae). They are set to a height of water, given that these fish inhabit running water with speed of movement of water from 1 - 3.5 m / sec, oxygen rich and has a lower water temperature. They cover altitudes above 450 m (Sotirov and Randelović, 1985).

Fish fauna the river Lim and its tributaries, and lakes of the northeastern part of Montenegro, are species of fish from the family Cuprinidae (barbel and minnow), grayling (Thymallidae), young (Hucho Hucho), pike (Esox lucius), barbel, the great cataract, river barbel (Barbus barbus), carp (Chondrostoma nasus), maple (Squalius cephalus), "jelšovka" (Telestes Agassi), burbot, "derać" (Lota lota) (Marić, 2010).

Quite specific habitats of fish fauna of the river valleys and ponds in the former gravel pits (at the mouth river Ljuča, Gradišnjica, Krastica, Zlorečica, Murinska, Velička, Dapsićka). These bodies of water, now provide optimal conditions for the formation of artificial ponds and sport-fishing center. At the mouth of the aggressive and the source of Lima, represented the largest representative of trout genus, and also the largest fish in the waters of the studied area - young men (Hucho Hucho). Young men can weigh up to 50 kg, a young man caught in 1985 weighing 41.3 kg was declared in Novi Sad, the world's fishing trophy, the LORIST.

For rural areas of the considered space is a very interesting concept and idea of applicable production of fish, primarily trout. Rural settlements in the north-eastern part of Montenegro, are extremely rich in springs, streams, and essentially, it should be noted that it is very suitable for the mini-ponds, which would separate study should examine, and then determine the results that might be expected, and other significant parameters, ie. requirements for construction of ponds, the issue of nutrition and water quality.

It is therefore necessary, according to the instructions provided on the website ([www.gastrolog.blogger.hr](http://www.gastrolog.blogger.hr)) and monographic publication (Rajović and Rajović, 2010), to meet several conditions:

1. The basic condition for the existence of adequate amounts of water inlet, which consists in the fact that it is necessary to make pasrmske ponds near the source of larger capacity (the spring), and addition to the pure cold streams and rivers, which certainly must have a sufficient amount of water throughout the year and that is to not mute or mute a short time under the influence of natural disasters.
2. Feeding trout stream. Under natural conditions feed on bottom fauna, flying insects and the like. When breeding in ponds can be used natural food (larvae, worms, shrimp), fresh food (slaughter waste - intestines, liver, spleen) and concentrated manufactured food that is most in use. The advantage of concentrated feed is that it is easy to deposit and maintain, have high nutritional value, require less labor, reducing water pollution and the introduction of diseases, the growth of fish is consistent and quick. 1 - 2 kg of food was derived from 1 kg of fish meat.
3. Water quality. It is necessary to cool and clean water. Water temperature throughout the year to range from a minimum of 5 ° C to a maximum of 20 ° C in summer. The optimal temperature for growing trout from 10 to 14 ° C. The chemical composition of water must be first-class quality. Best production is achieved by changing the water of 72 times in 24 hours,

which means that for 1 m<sup>3</sup> Trout Farm (which can produce 30 - 50 kg of fish) to 72 m<sup>3</sup> for 24 hours. Quantities of water can be less, but not recommended less than 40 edits in 24 hours.

All the fishing waters of the considered space, assigned to the fishing organizations "Berane" in Berane, "Lim" in Andrijevica and "Plav Lake" in blue on the use, management and protection. Sport fishing deals with some 800 registered fishermen and recreationists. The significant number of people who regularly resides in nature should be with proper training, use it as an important and indispensable factor in its preservation. With sports - fishing tourism, as well as with hunting, it should draw primarily rural - tourist offer in the form of accommodation, local cuisine specialties and the like, places to eat a night in a hotel or hunting and forest facilities.

Game species is in terms of number of species and diversity of the population and spatial localization of grass and forest and mountain fitosenoze in sub mountain zone. Municipality of Berane, Andrijevica and Plav those of the East hunting area and hunting grounds of Montenegro (Decision on the establishment of hunting areas / Fig. Gazette No.14 CG-09).

Considered area includes 6 mountain hunting grounds: "Maja Karanfil" "Ridska Gora", "Visitor", "Komovi", "Berane" and "Turjak. Hunting grounds covered an entire area studied, except the area covered by permanent settlements, which were mostly scattered through the valley of Lima, Plav Lake and tributaries Lima. The hunting grounds are rich in forest-grass complexes, lakes, springs, natural shelter.

Springs and streams (the majority) does not dry out during the year, which is of special importance for the development and maintenance of game populations. But considering that the game referred to the natural nutrition, intensive cattle breeding in particular it affects the lives of big game. Departure from these basic and common feature of hunting, are present only in the extreme south of the

studied area (hunting, "Maja Karanfil", "Visitor" and "Komovi"), where they feel gaps food and water, due to the presence of "naked" Karst (Knežević, 1990).

In the northeastern part of Montenegro, the species is a large number of animals: rows ungulates (Artiodactyla) from the family of deer (Cervide), rows deer, fallow deer (*Dama dama* L.), roe deer (*Capreolus capreolus* L.), mouflon (*Ovis musimon* Pall .) from the pig family (Suidae), wild boar (*Sus scrofa* L.), rows beast (Carnivora) from the bear family (Ursidae) brown bear (*Ursus arctos* L.). Red Beast (Carnivora) from the families dogs (Canidae) wolf (*Canis lupus* L.) ([www.lovačkisavez.me](http://www.lovačkisavez.me) ).

We note the presence, small furry animals: Rows Beast (Carnivora) from the family rate (Mustalidae), marten marten (*Martes foina* Her), rate (Mustalidae), marten (*Martes martes* L.), weasel (*Mustela nivalis* L.), large weasel, ermine (*Mustela erminea* L.), badger (*Meles meles* L.), polecat (*putorius putorius* L.) from the family cat (Felidea) wild cat (*Felis silvestris* Schr.), "dvozupci" Rows (Lagomorpha) from the family rabbits (Leporidae), hare (*Lepus europaeus* Pall.), Rows rodents (Rodentia) from the family of squirrels (Sciuridae), a dormouse (*Glis glis* L.), squirrel (*Sciurus vulgaris* L.), red beast (Carnivora) from the family dogs (Canidae) foxes (*Vulpes vulpes* L.), jackal (*Canis aureus* L.) ([www.lovačkisavez.me](http://www.lovačkisavez.me) ).Deserves special attention and birds from the ranks of chicken (Galliformes) from the family forest chicken (Tetraoninae), grouse, gluhan (*Tetrao urogallus* L.), Polish chicken (Phasianinae), chukar partridge (*Alectoris graeca* Meissn.) "Pućpura" quail (*Coturnix coturnix* L.); Rows Snipes (Limicolae) from families snipe (Scolopacidae), woodcock - (*Scolopax rusticola* L.), Snipe (Small cocci ) (*Gallinago gallinago* L.), rows doves (Columbiformes) from families of pigeons (Columbidae) ringdove (*Columba palumbus* L.) dove (*Columba livia* Gmelin.),turtle dove (*Streptopelia turtur* L.), dove (*Streptopelia decaocto* FRIVA.) ducks rows (Anseriformes) from the family geese (Anseridae), wild goose (*Anser anser* L.); Rows ducks (Anseriformes) from the families of ducks (Anatidae), duck wild - deaf (*Anas platyrhynchos* L.), duck Wigeon (*Anas*

penelope L.), the duck rattle (*Anas strepera* L.), duck head (blue duck) (*Aythya ferina* L.), crested (Tufted) duck (*Aythya fuligula* L.), duck "Krža" Teal (*Anas crecca* L.), Rows crane (*Gruiformes*) from the family bar coca (*Rallidae*); Rows singer (*Passeiformes*) Coot - "baljoška" (*Fulica atra* L.), from the crow family (*Corvidae*), Hooded Crow (*Corvus corone cornix* L.), Magpie (*Pica pica* L.), Jay (*Garrulus glandarius* L.) ([www.lovačkisavez.me](http://www.lovačkisavez.me)).

According to the data in Table 3 the close of the wild game, numbers of the population is said deer (*Capreolus capreolus*) that is seen in all hunting areas in all height zones of oak, to the Visitor sat alpin, where the most numerous.

Table 3 Number of animals per species in 2000

Number of animals per species	Hunting Area "May Carnation"	Hunting area "Ridska Gora"	Hunting area "Visitor"	Hunting area "Bjelasica i Cmiljevica"	Hunting area "Turjak"	Hunting area "Komovi"
Doe	62	76	241	33	17	47
Chamois	64	69	151	-	-	24
Bear	18	21	17	38	9	47
Wild boar	35	69	22	21	19	19
Heath cock	28	63	201	25	-	114

Source: Assessment of hunting organizations on number of animals

Although shown in the database, the game population cannot be considered accurate (because the data is mainly resulting from periodic studies of individual authors assessments and hunting clubs), we can conclude that the considerable, disproportionate to the conditions that exist in the subject area, for his development. The word is therefore on the conditions (geomorphologic, climatic, hydrographical, biographical, etc..), Which operate under the three major and interrelated geomorphologic units (river valleys, mountains, alpine massifs) are

favourable for growing, maintaining and retaining hunting game ( Jović and Vučković, 1981).

Hunting organizations ("Ivangrad" in Berane, "Petnjica in Petnjica," Komovi in Andrijevisa, "MajaKaranfil" in Gusinjeand "Hridsko Lake" in Plav) would have to urgently approach the implementation of the guidelines set out in the Hunting management plan. The hunting grounds should have permanent access to the numbers of animals per species, reproduction, health, nutrition; ensuring peace in hunting ... Action to protect and improve wildlife will have a significant impact for not only the development of hunting, but also the overall economic development of the considered space.

As an example of good management of hunting grounds with the aim of breeding animals, the hunting organization Komovi from Andrijevisa is finalizing the project procurement wild rabbits. In this respect in the village of Bozice made a shelter for wild rabbits, the surface of 750 m<sup>2</sup>. This project is of great importance, since rabbits and other wild animals, this hunting ground, threatening the right of extinction. Respecting natural laws, environment and conditions necessary for survival and breeding of animals at the shelter have already placed the first rabbits that expected to continue their reproduction ([www.beranetown.net](http://www.beranetown.net) )

Should keep in mind that are would consider a strict reservation hunting area, could organize interesting and widely developed world photo camera. Here the domestic and foreign guests in the beautiful landscapes Bjelasica, Turjak, Prokletije, Visitor, Maya Carnation, Zeletin, hilly and Montenegro, Komovi, Trešnjevik, instead of killing enjoyed observing and recording High Representative hunting game.

Certain species of wild animals in the subject area but have a trophy property of significant value. At the international hunting exhibition in Florence in 1964 and awarded the gold medal for the trophy wild boar and chamois from Prokletije. In Turin 1970 at the exhibition with the boar, tusks Prokletije by an international

jury declared the trophy a record of its kind in the world. At the international exhibition in Novi Sad in 1967, wild boar tusks, won two gold medals and confirmed the high trophy value. Bears with Prokletije and Komovi reaching the weight to 300 pounds and belonged to the largest specimens in Yugoslavia (Fund professional documents Republic Institute for Nature Protection Montenegro, 1981, 1991)

## **Conclusion**

Extremely rich flora and fauna is an indispensable factor of economic development in this part of north-eastern Montenegro. Of course, no matter how much natural wealth of flora and fauna of the studied area was not large, it is not unlimited. Therefore its use must be planned and rational. The results of analysis of the current situation suggests the following conclusions:

First, according to statistics from 2000, the extent of forest cover in the observed area amounts to 42.02%. Of the total area under forest (62,432 ha) in the north-eastern part of Montenegro, the decorated trees waste 85.76% (54,643 ha), and the disordered 14.24% (9075 ha). The total density, is estimated to be 13,882,516 m<sup>3</sup>. The structure of forests are the most widespread economic forests affect 27,196.24 hectares or 43.56%, low economic forest 2657.17 hectares or 4.26%, protective 17,972.64 hectares or 28.80%, fallow land 7742.19 hectares or 12.40%, and scrub and scrub 6858.05 hectares or 10.98%.

Second, taking into account the habitat conditions and phytocoenological composition, grass cover this part of north-eastern Montenegro, can be divided into: the valley meadows in moist habitats, mountain meadows and pastures, mainly related to the belt of oak and beech forests and alpine meadows; that reach the highest peaks of mountains in the composition of forest and grass community entered a large number of medicinal, aromatic, spicy, edible plants and mushrooms. In the studied area, registered about 60 medicinal plant species.

Most of them a prominent place in folk medicine, pharmaceutical production, which is very important for the tourism development.

Third, transform sentient natural cover in the north-eastern part of Montenegro, began late last century, which will disturb the relations in the original vegetation. Destruction of vegetation cover (forest) was carried out from the direction of the valley of Lima, it is a range of arable land, so its greatest degradation, related to the belt of oak and beech forests. Today, the processes of land reclamation and pollution of the environment, more and more affected by agricultural land and ground water in rivers and lakes there is less of life, progress on land-vegetation degraded and impoverished regions devastated by erosion, some species disappear, and for many it is, threatening the viability of . Therefore, agricultural cover the observed space is not homogeneous, but predvojen natural and other anthropogenic cover types (technical production, urban).

Fourth, plant life, make beautiful decoration in this part of north-eastern Montenegro. Rightly states that Prokletije Komovi and Bjelasica belong to the most interesting and significant vegetation areas in the country. The considered area is rich in valuable natural elements, which have not yet been placed under protection. The exception is, part of the national park Biogradska worse and more recently Prokletije.Komovi Regional Park (east and northeast) currently includes 1,100 ha of hunting reserve. Spatial Plan of Montenegro registered and mountains Turjak with Hajla (belonging to the considered area, except the extreme eastern side, which belongs to the river Ibar). They are in addition to representatives of Alpine, Central European and Mediterranean flora species are encountered and the Balkans and the autochthonous endimiteti. In the north-eastern part of Montenegro, there are monuments that have not been protected as natural areas. It is primarily the river canyon Grlje, Skakavac waterfall, hot about, source code Gusinje, Rid and Visitor Lake, Nameless caves and caverns on Divjak.

Fifth, the animal world as an element of the natural environment of the considered space, which is an ingredient of various ecosystems, offers significant opportunities for economic evaluation. However, the physical-geographical studies, the animal world is not disputed considering in detail. Therefore, in the text, assessed value and meaning of the ichthyofauna fauna of wild game, in terms of tourism and recreational needs. Ichthyofauna fish the river Lim and its tributaries, and lakes make fish species from the family Cuprinidae (barbel and minnow), algae (Sotus room), grayling (Thumelidae), young (Hucho Hucho), pike (Esox lucius), barbel, large barbel, river barbel (Barbus barbus), carp (Chondrostoma nasus), maple (Squalius cephalus), "jelšovka" (Telestes Agassi), burbot, "derać" (Lota lota). Quite specific habitats of fish fauna are river valleys and ponds in the former gravel pits (at the mouth Ljuča, Gradišnjica, Kraštica, Zlorečica, Murinska, Velička, Dapsićka River). These bodies of water, providing optimal conditions for the formation of artificial ponds and sport-fishing center. Municipality of Berane, Andrijevića and Plav those of the East hunting area and hunting grounds of Montenegro (Decision on the establishment of hunting areas / Fig. Gazette No.14 CG-09). Considered area includes 6 mountain hunting grounds: "Maja Karanfil," "Ridska Gora", "Visitor", "Komovi", "Berane" and "Turjak. The hunting grounds are rich in forest-grass complexes, lakes, springs, natural shelter. Springs and streams (the majority) does not dry out during the year, which is of special importance for the development and maintenance of game populations. As an example of good management of hunting areas, hunting organization Komovi from Andrijevića, nearing the end of the project procurement wild rabbits. Bozice in the village made a shelter for wild rabbits surface 750 m<sup>2</sup>. This project is of great importance, since rabbits and other wild animals, this hunting ground, threatening the right of extinction.

Flora and fauna north-eastern of Montenegro, the example of the municipality of Berane, Andrijevića and Plav may be from different aspects involved in economic development and can meet many needs of modern man, such as vacation,

gathering strength, walking, hanging out with friends, enjoying the healthy food and delicacies, enjoying the scenery and others (Bulatović and Rajović 2007). Establishing interpersonal contacts socializing in nature, is a sociological aspect of the positive effects of flora and fauna, the people. The green color of leaves, their quiet sumo creature, phytoncide presence in the air, increasing the oxygen content have a favorable physiological effects on humans, improve his health and work ability.

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