

International Workshop for CEE Countries

“Tourism in Mountain Areas and the Convention on Biological Diversity”

1st – 5th October, 2002

Sucha Beskidzka,

Babia Gora National Park, Poland



Organized by

Ecological Tourism in Europe, Bonn/Germany
Academy of Sciences, Institute of Tourism, Krakow/Poland

Supported by

The Federal Agency for Nature Conservation and the German Federal Ministry of Environment, Nature Conservation and Nuclear Safety.



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CASE STUDY

THE TOURISM POTENTIALS AND IMPACTS IN PROTECTED MOUNTAIN AREAS

POĽANA PROTECTED LANDSCAPE AREA – BIOSPHERE RESERVE, SLOVAKIA

September 2002

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Introduction

Aim of this study is to analyze possible implementation of sustainable tourism in the protected mountain area – Poľana PLA/BR.

Biosphere Reserves serve as an example of sustainable life and also as an example of acceptable balance and common relationship between man and his environment. They also play an important role not only for local inhabitants but for the whole society, as well.

Seville Strategy following the principles of the Convention on Biological Diversity and Agenda 21 provides recommendations and principles for developing effective biosphere reserves and for setting out the conditions for the appropriate functioning of the World Network of Biosphere Reserves. Knowledge of any character gained from such precious natural area can help to understand the impact of human activities, including tourism upon nature and vice versa.

The Slovak republic has been associated with United Nations Educational, Scientific and Cultural Organization and its Man and Biosphere Program (UNESCO/MAB) since its beginning in 1971 (at that time as a part of Czechoslovak Federation). An important action of this Program was the inauguration of a global network of biosphere reserves in 1974.

The Czechoslovak National UNESCO/MAB Committee accepted that establishment of individual biosphere reserves would be an important tool for innovative landscape conservation and for balanced management of natural resources and cultural values. In 1976 the first three Biosphere Reserves within Czechoslovakia were declared that the MAB International Coordinating Council in Paris acknowledged as legitimate members of the global network of Biosphere Reserves. After more than a decade further three Czechoslovak Biosphere Reserves were established together with Poľana Protected Landscape Area (1990).

Nature and landscape protection in Slovakia underlies the Act of the National Council of the Slovak Republic No. 287/1994 Coll. of Laws on Nature and Landscape Protection. In accordance with this Act the system of complex nature and landscape protection is implemented into following categories: 1st level of protection – the territory of Slovak Republic not included in any of the higher levels of protection, 2nd level of protection – Protected Landscape Area (PLA), 3rd level of protection – National Park (NP), 4th level of protection – Protected Site (PS), 5th level of protection – Nature Reserve (NR), Nature Monument (NM), National Nature Reserve (NNR), and National Nature Monument (NNM). At present Poľana BR possess the national legal status of Protected Landscape Area and thus being fully in conformance with the requirements of the UNESCO/MAB program.

1. GENERAL DESCRIPTION OF THE AREA

Protected Landscape Area (PLA) Poľana was declared in 1981. The primary aim of the protection was an intention to protect abiotic part of nature together with plant and animal associations and species and at last, but not at least the protection of unique and peculiar landscape feature. By decision of the Bureau of The International Coordinating Council of the Program on Man and Biosphere, as a part of the UNESCO, the Poľana PLA was recognized as part of the international network of Biosphere Reserves (BR) in 1990.

The project area is located in Central Slovakia and it belongs to the Central Slovakian Volcanic Mountain System of the Western Carpathians. The geographical coordinates of middle point are



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48 degrees 39` northern latitude, 19 degrees 29` eastern latitude. The Poľana PLA/BR covers administrative borders of following districts: Zvolen, Detva, Banská Bystrica and Brezno and following villages: Čierny Balog, Detva, Dúbravy, Hriňová, Hrochoť, Hronec, Ľubietová, Očová, Poniky, Povrazník, Sihla, Strelníky, and Valaská.

The project area is identical with borders of the Poľana PLA/BR. It lies outside of the main transportation highways. The closest transportation route lies eastwards and it copies the Poľana LPA/BR boundary on leg approx. 13 kms long (road 529 Zvolen – Brezno connected to D1 highway).

According to the Regulation of the Ministry of Environment of Slovak Republic No. 431/2001 of the Coll. of Laws the total area of the Poľana BR is 20,360 ha, area of the core zone with 6 cores represents 1178 ha, the buffer zone covers 9,183 ha, and the transition zone 9,999 ha.

Poľana PLA/BR belongs among the biggest extinct volcanoes in Europe and the highest volcano mountains in Slovakia. Owing to its elevation range of almost 1000 m (the lowest point at an altitude of 460 m and the highest at 1458 m) there is a presence of thermophilous as well as mountainous species of plants growing and animals living on a relatively small area.

review of hectareage*	
total	20 360.4804 ha
forest land	17 102.3626 ha
agricultural land	3 001.4072 ha
water surface	102.4992 ha
built-up area	48.6161 ha
undefined	105.5953 ha

* according to the Regulation of the Ministry of Environment of Slovak Republic No. 431/2001 of the Coll. of Laws

Poľana PLA/BR contains 3 National Nature Reserves with the total area of 874,990 ha, 6 Natural Preserves (83,520 ha), 1 National Nature Monument (3,980 ha), 7 Nature Monuments (8,813 ha) and 4 Protected Sites (4,280 ha).

In 1999 Poľana Biosphere Reserve obtained EUROSITE Award by the IUCN European Regional Office. The EUROSITE Award was given for the high quality care of the PLA during the last two years and, at the same time, for the management plans for the future period. The Award is a joint success of the Slovak Environmental Agency – Administration of the Poľana PLA, MoE SR, as well as governmental and non-governmental bodies and individuals.

1.1 History of protection

The first official proposal for the protection and conservation of the project area emerged from plant sociological studies led by Mr. Mikyška (1934) and later from animal community studies led by Mr. Turček (1951). At that time specific needs for the protection of diversified biotops and biota of this region were clearly identified. Subsequent geological investigations approved exceptional geological and geomorphological features that are characteristic for Poľana.

In span of years from 1964 to 1980, four Nature Reserves (*Hrončecký grúň*, *Ľubietovský Vepor*, *Poľana* and *Pod Dudášom*) and five Nature Monuments (*Bátovský Balvan*, *Jánošíkova Skala*, *Kalamárka*, *Veporské Skalky* and *Bystré* waterfall) were declared. Complementary research



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identified the need for establishment of a Protected Landscape Area that was declared by the Ministry of Culture in 1981 according to the Regulation No. 97/81 of Coll. of Laws. Main subjects of protection were as follows: protection and care for areas with high natural values and management for the optimal use of cultural, scientific, economic, hydrological, and health resources of given area. The protection of the area at legal basis ensures the protection of rare ecosystems and important abiotic components of the environment as well as preservation of primeval forest communities and characteristic landscape.

Scientific supervision of conservation activities was initially provided by Regional Center for the Monuments and Nature Conservation seated in Banská Bystrica (1981 – 1992) and later by the National Center for Nature Conservation in Liptovský Mikuláš.

The Administration of the Poľana PLA was established in 1984 which staff started the coordination of rational use of nature resources and the use of optimal measures within nature conservation. Between 1984 and 1990 further proposals were made for adequate protection of small but highly valuable localities: *Vrchslatina*, *Pri Bútľavke*, *Havranie Skaly*, and *Mačinová* as for Nature Reserves; *Príslopy* and *Horná Chrapková* as for Protected Sites; *Buk pod Klúkou*, *Brest na Hukave*, *Spády* and *Kamenistý stream meanders* as for Protected Nature Monuments.

Delineation of conservation zones in the Poľana PLA was outlined in connection with the application for inclusion of this area into the network of biosphere reserves in 1989. Poľana PLA was recognized as part of the international network of Biosphere Reserves (BR) in 1990.

1.2 Nature

Nearly 90% of the Poľana PLA is covered by forest reaching from the 2nd to the 7th forest vegetation zone with the majority of conifers (62 %). The southernmost part of this area represents the northeastern boundary of thermophilous flora and fauna species abundance as Mt. Poľana is exposed to warm incoming air masses from the south. Unique is also the special landscape feature as it alternates forests with meadows, permanent grasslands with pastures and settlements.

1.2.1 Geology and morphology

Poľana Biosphere Reserve is formed by Upper Tertiary rocks: veporids in the east, and volcanic rocks - resistant andesites alternating with less solid tuffs and tuffaceous rocks - in the central and western parts. The volcanic activity of the Badenian and Sarmatian periods (12 to 13 million years ago) mainly affected the center of the reserve, near Kyslinky, which is a well-defined erosive caldera, opening westwards. Its north - south diameter is about 6 km, and its circumference about 20 km. After a relatively long dormant period, during which much of the volcano was eroded, volcanic activity recurred. On the whole, there were four periods of volcanic activity. The stratovolcano of the last period, which probably reached to an altitude of 2 500 m, buried all earlier units and created Poľana's final form. Through weathering and erosion, a typical centripetal net of streams developed on inner slopes of the caldera. The deep depression with steep slopes, almost of a circular shape and well visible on satellite images, was slowly formed over eons. The ridge is broken only from the west by a mountain stream Hučava draining the crater's inner part. With this one exception the surface run-off from the mountains surrounding the caldera is centrifugal. *Hrb* quota (1255 m a.s.l.) represents the geographical center of Slovakia.



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1.2.2 Climate

According to the Slovak Climate Classification that part of Poľana BR below 800 m above the sea level belongs to the moderately warm zone. Higher altitudes belong to the cold climatic zone. The mean annual temperature ranges between 2.5 and 8.0 °C; the mean annual precipitation varies from 650 to 1300 mm. The precipitation totals reach higher values in spring and summer (April – September) with the maximal value in June, followed by autumn and winter with the minimal value observed in January.

1.2.3 Soil

Tertiary volcanic rocks build the larger part of the territory (60%), the minor part (40%) is built by crystalline rocks. The existence of a narrow transition zone, in which soils have either a mixed substrate or upper soil layers originated from a different rock than the lower layers, is an evidence of former earth ground solifluction.

On the volcanic bedrock cambisols and andosols were formed. Base-saturated cambisols occur up to 700 – 800 m above the sea level, while base-unsaturated cambisols prevail above 800 m. In the upper part of the mountain andosols are present. Andosols as a term has its origin in Japanese where *an-do* means black road or soil. Presence of this type of soil is unique, with a high content of volcanic glass and thick humus horizon. Andosols have very favorable physical and chemical properties and a high fertility of these soils allow trees to reach extraordinary dimensions. The crystalline properties are typically characterized by special kind of clay materials, allophane, imogolite, halloysite and ferrihydrite. Allophane is a round sphere, extremely reactive (up to 800 square m per gram) but lacks the cohesion of typical clays found in other common soil types, such as smectite. The soil is light and very porous. It can store large quantities of water, much more than any other soils. Andosols have a tendency to bind organic matter and therefore often contain much more organic materials than other soils under similar conditions.

Generally, in the soil cover of the Poľana LPA/BR prevail soils with favorable properties that can also be regarded as pedologically unique ones. These soils were also ranked by their resistance against erosion and immissions. It follows from their order that soils with positive environmental functions clearly dominate the area.

1.2.4 Flora

Poľana Biosphere Reserve is characterized by a blend of thermophilous and mountain plant species. This pattern reflects many environmental factors: the vertical zonation of climate over an altitude range of nearly 1000 m, alternating rock and soil types, the prominent influence of slope aspect and, last but not least, the region's outlying position south of the main West Carpathian arc. Thus, despite the common floristic rarity of volcanic bedrocks, Poľana's vegetation is quite rich. Remnants of beech-oak and oak-beech forests remain only in the southwestern foothills. Beside the oaks (*Quercus cerris*, *Q. petraea*, *Q. robur*) and the beech (*Fagus sylvatica*), these forests also include the hornbeam (*Carpinus betulus*) and the limes (*Tilia cordata*, *T. platyphyllos*). The most frequent forest communities in the area are beech and fir-beech forests. They are known for their remarkable standing crop and lofty trees, which often attain extraordinary dimensions on favorable humus-rich andosols.



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In addition to the dominant stand-forming trees, these highly productive stands also include Norway spruce (*Picea abies*), sycamore (*Acer pseudoplatanus*), elm (*Ulmus glabra*), and ash (*Fraxinus excelsior*), growing as a scree forest stands. The tallest beech trees grow on warm, south-facing slopes.

The summits are occupied by primeval spruce stands, encircled by a narrow zone of spruce-beech-fir forests. Poľana's native spruce forests are the southernmost forests in the West Carpathians. They also include rowan (*Sorbus aucuparia*) and sycamore (*Acer pseudoplatanus*), with a shrub layer formed by black honeysuckle (*Lonicera nigra*), Silesian willow (*Salix silesiaca*), mezereon (*Daphne mezereum*), alpine rose (*Rosa pendulina*), and other species. There are also mountain and subalpine species growing in the two-layered herb understorey, such as Austrian leopard's bane (*Doronicum austriacum*), alpine blue sow-thistle (*Cicerbita alpina*), hedge-garlic adenostyle (*Adenostyles alliariae*), plane-leaved buttercup (*Ranunculus platanifolius*), Hungarian tassel-flower (*Soldanella hungarica*) white false helleborine (*Veratrum lobelianum*), greater woodrush (*Luzula sylvatica*), and villous smallreed (*Calamagrostis villosa*). Secondary meadows and pastures have developed on many large deforested sites in the southern foothills around the typically scattered settlements, farms and pastures.

The ecosystems of mires, springs and waterlogged floodplains along mountain streams are shrinking, and thus their plant species belong to the most valuable and endangered biota; they include populations of grass of Parnassus (*Parnassia palustris*), sundew (*Drosera rotundifolia*), globe flower (*Trollius europaeus*), and Siberian flag (*Iris Sibirica*). On wet meadows orchids are particularly frequent: green-winged orchid (*Orchis morio*), fragrant orchid (*Gymnadenia conopsea*), and others (*Dactylorhiza sambucina*, *D. incarnata*, *D. maculata*, *D. ruperti*). In spring, one of the most memorable sights is of flowering crocus (*Crocus heuffelianus*). On many cliffs, one can find polypodies (*Polypodium vulgare*, *P. interjectum*), alpine woodsia (*Woodsia alpina*), spleenworts (*Asplenium septentrionale*, *A. trichomanes*), and alpine rose (*Rosa pendulina*). Yew (*Taxus baccata*) is present on a few sites. There are also several characteristic xerothermophilous plant species in Poľana, such as rose campion (*Lychnis coronaria*), wormwood (*Artemisia absinthium*), wild basil (*Calamintha clinopodium*), noble sneezwort (*Achillea nobilis*), and hoary cinquefoil (*Potentilla argentea*). Among the rarest species belong Carpathian endemic dame's rocket (*Hesperis nivea*) and a Sudetic-Carpathian endemic Sudetic pansy (*Viola sudetica*). Poľana Biosphere Reserve also possesses a rich cryptogamic flora, particularly of ferns and bryophytes; mycorrhizal associations, moist soil and decaying wood offer abundant substrata for symbiotic, saprophytic and parasitic fungi. The presence of many epiphytic lichens, such as meadowsweet usnea (*Usnea filipendula*) and presence of species such as *Strigula stigmatella*, *Gyalecta ulmi*, *Arthronia vinosa*, *Thelopsis rubella* shows that harmful pollution did not reach the area of the reserve. Aquatic habitats are rich in algae and blue-green algae.

So far, 1200 species of higher plants were found in the project area out of which 200 are protected.

1.2.5 Fauna

The variety and species-richness of the Poľana Biosphere Reserve reflects its environmental diversity. There are many biogeographically outstanding and biosociologically significant animal species, whose rare populations are often endangered and thus strictly protected. The



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mollusc fauna includes several Carpathian endemics, such as *Trichia bakowski*, *Vestia elata*, *V. turgida* and *Vitrea transsylvanica*.

Insects are the most species-rich class of invertebrates. Straight-winged insects, e.g., field grasshoppers (*Chortippus albomarginatus*, *C. biguttulus*, *C. dorsatus*, *C. mollis*), green grasshopper (*Decticus verrucivorus*), and chirping bush cricket (*Tettigonia cantans*) are frequent on meadows with solitary hummocks and rocks. Two-winged flies, particularly of non-biting midges (*Chironomidae*), are characteristic of unpolluted streams.

The beetle fauna is very diversified. In remnant primeval forests one may find ground beetles (*Carabus variolosus*, *C. irregularis*, *C. auronitens*), wood-borer (*Eurythyrea austriaca*), scarlet flat bark beetle (*Cucujus haematodes*), and the longicorn beetle (*Rosalia alpina*). Mountain and boreomontane relics include the ground beetle (*Carabus arcensis*), snapping beetles (*Lacon fasciatus* and *Ampedus tristis*), and dung beetle (*Aphodius alpinus*). Rare thermophilous species are represented by ground beetle (*Carabus arcensis*) and the wood-borers (*Eurythyrea quercus* and *Anthaxia funerula*).

Poľana BR is also notable for its fragile and colorful butterflies: black apollo (*Parnassius mnemosyne*), swallowtail (*Papilio machaon*), blues (*Erynnis tages* and *Pyrgus malvae*) hairstreaks (*Melitaea cinxia* and *M. didyma*), coppers (*Lycarna tityrus*, *L. alciphron*, and *L. hippothoe*), forester (*Zygaena briyae*), and other species of Lepidoptera (*Kessleria albithoracella*, *Agonopterix daronicella*, *Alcis jubata*, *Idaea aureolaria*, *Catastia marginea*, *Odezia atrata*, *Hyppa rectilinea*).

The vertebrate fauna is also very diverse. Poľana gives home to some 24 species of fish and 10 species of reptiles. Trout (*Salmo trutta fario*) lives in brooks and mountain streams, together with some of 11 species of amphibians; the most endangered are newts (*Triturus vulgaris*, *T. alpestris*, *T. montadoni*) and fire salamander (*Salamandra salamandra*). Common tree frogs are also present, although populations have declined remarkably in both number and density in recent years. The Dalmatian frog (*Rana dalmatina*) reaches the southern part of the reserve.

Nine species of reptiles are found in Poľana. Common lizard (*Lacerta vivipara*) lives in mires, wet meadows, and stream banks, while wall lizard (*Lacerta muralis*) can be found in sunny rocky and forest-steppe habitats. The green lizard (*Lacerta viridis*) is very rare. Smooth snake (*Coronella austriaca*) lives in rocky areas. Two other species of snakes are seriously endangered: common viper (*Vipera berus*) and aesculapian snake (*Elaphe longissima*), found on the sunny slopes of Hrochot'ská Valley.

The avifauna is extremely rich with its 174 species out of which 128 nests in the area. Characteristic nesting birds in primeval mixed and coniferous mountain forests are pygmy owl (*Glaucidium passerinum*), Tengmalm's owl (*Aegolius funereus*), ring ouzel (*Turdus torquatus*), three-toed woodpecker (*Picoides tridactylus*), and crossbill (*Loxia curvirostra*). Grouse species include both hazel grouse (*Tetrastes bonasia*) and capercaillie (*Tetrao urogallus*), whose decline in recent decades is due to the interaction of many factors, related particularly to the past timber exploitation.

Many species nest in meadows and pastures with scattered trees and broken rocks: corncrake (*Crex crex*), quail (*Coturnix coturnix*), and wheatear (*Oenanthe oenanthe*). The edges of the meadows give suitable habitat for wood lark (*Lullula arborea*). Small clearings with mown meadows and lonely houses, locally called "lazy", are not only a significant landscape element but also a habitat of species-rich avifauna. Among the rare nesting birds found in these human-influenced but environmentally balanced habitats are kestrel (*Falco tinnunculus*), fieldfare (*Turdus pilaris*), and spotted flycatcher (*Muscicapa striata*). The population of lesser grey shrike



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(*Lanius minor*) nesting in orchards is an important phenomenon in Central Europe. The rare and colorful kingfisher (*Alcedo atthis*) nests along streams.

Mammals are also well represented in the Poľana BR. There are altogether 59 species found. Several species of bats live in snags, rock crevices, hay barns and old buildings. The seriously endangered otter (*Lutra lutra*) can sometimes be encountered along the streams. In quiet parts of the forest live about 40 brown bears (*Ursus arctos*), Northern lynx (*Lynx lynx*) and wolf (*Canis lupus*). The most common game animal is red deer (*Cervus elaphus*).

2. THE HUMAN DIMENSION

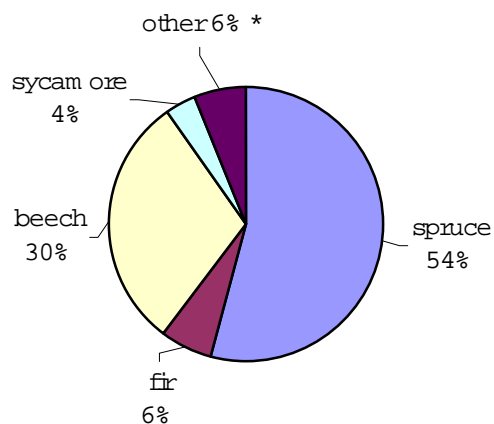
2.1 Forestry

The Poľana PLA/BR total area represents 20,360 ha out of which 17,287 ha is forested (85 %). Forests consist of mixed coniferous and broad-leaved species which composition is similar to the original. The composition is 62 % of conifers (Norway spruce 54.1 %, silver fir 6.2%, European larch 1.5 %, Scots pine 0.3 %) and 38 % deciduous trees (beech 30.1 %, sycamore 3.6 %, ash 2 %, oak 1.3 %, hornbeam 0.6 %, elm 0.2 %).

On the project area all three forest categories are present. Management forests cover 6,920 ha, protection forests forest 1,184 ha and forests with special purposes 9183 ha.

Project area is under management of two resorts: Ministry of Environment dealing with nature protection and Ministry of Soil Management under which Forestry Division works. State Forest Enterprise must follow Forestry Plans and manage forests. Forests are managed according to ten-year Forestry Plans that are elaborated under cooperation of foresters from Forest Enterprises and representatives of Poľana PLA/BR Administration. Nowadays, 62,1 % are state owned forests and are managed by two Forests Enterprises (FE): FE Čierny Balog and FE Kriváň.

tree species composition



* larch 1.5 %, pine 0.3 %, ash 2.0 %, oak 1.3 %, hornbeam 0.6 %, elm 0.3 %



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Problems recognized

❖ Administration of Poľana PLA/BR

District Authorities in Banská Bystrica, Division of Nature Protection collaborates at elaboration of Forestry Plans. Certain requirements were applied to use sparing management methods in forests. Requirements were confirmed and nowadays in the buffer zone of the Poľana LPA/BR grow forests categorized as forests with special purposes in which management should subordinate interests of nature protection. The biggest problem recognized in this area is that the management of forests with special purposes only little differs from the management in the management forests. Such technologies are used, which damage natural regeneration and causes erosion. Reforestation anticipates natural regeneration, fencing is not used what results in damage caused by grazing (especially the absence of fir is enormous).

Cutting once during the growing season is not sufficient, especially on fertile localities, as wild plants overgrow seedlings. In forests with special purposes often extraction of whole stems by processor is used, requiring a lot of space what damages standing trees. Consequent burning of branches is also problematic measure used.

❖ Forestry Enterprise Kriváň

On the project area three FA of the FE Kriváň operates: FA Očová, FA Poľana and FA Kyslinky. Protection interests often require untraditional methods for wood extraction that is more expensive and it is not possible to finance from inner budget. The FE Kriváň does not agree to abandon the control of bark beetle population, as according to their opinion nature is not able to handle the outburst by itself. It is suggested to remove fallen stems of dead trees.

Their opinion is to manage forest (at least to use basic and necessary defensive measures) of the Poľana BR, except for research localities and primeval forests, and thus prevent the natural development of forest from injurious agents.

FE Kriváň would like to cooperate in the field of protection from forest fires and uncontrolled (illegal) woodcutting.

❖ Forestry Enterprise Čierny Balog

FE Čierny Balog manages about 32,000 ha of forests via 8 Forestry Administrations. Three Forest Administrations (FA Sihla, FA Hronec, FA Osrbliu) manage forests within the project area of Poľana PLA/BR.

FE Čierny Balog does not use any clear cutting measures for past 10 years. Areas cut never exceed 1 ha. Manipulation with oil substances is also minimal. Ecological oil enviropal is used and woodcutters use plant-based oil. Damages caused by grazing represent still problem but the situation over last 11 years has improved. Harvestors are not used on places where natural regeneration could be damaged

Recommendations

It is essential that soft-forestry and site-adopted methods are applied. They include:

- The promotion of indigenous tree species, most of all fir and beech; only this composition will maintain the original attractive appearance of the local forests that in turn is a key factor for ecotourism development in the area.



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- The omission of clear-cut system as a whole and its substitution by shelterwood system; the shelter wood system must however not be applied mechanically, but only after a sufficient basis for natural regeneration develops, otherwise weeds (ferns, *Senecio sp.*, *Calamagrostis*) will prevail in local humid natural conditions.
- The expansion of the Butlavka National Nature Preserve and the Poľana National Nature Preserve as to include larger portions of old-growths in the 6th vegetation stage
- Woodcutting and extraction by heavy machinery raises the runoff by factor 10 and should therefore be avoided. The use of horses for wood extraction should be promoted by incentives.

2.2 Hunting

The Poľana Protected Hunting Reserve was founded in 1975 for the purpose of systematic research, biologically based breeding, improved breeding, as well as trophy value. It serves as unique gene pool of red deer (*Cervus elaphus*). This reserve has almost identical boundary with the PLA/BR. Parallel coexistence of a biosphere reserve and a hunting reserve may appear rather controversial. However, it reflects the long-lasting rights and management of the area concerned. Even the core zone, unless properly fenced, cannot avoid game management. In forests live about 40 brown bears (*Ursus arctos*). In order to control the population size of this big predator, there is an annual hunting season for three or four specimens.

Problems recognized

Black hunting could be a problem for the Poľana BR but at present it does not represent a threat and game population is under control of legal and well-educated hunters of Hunting Associations.

Recommendations

Possibilities of the fee hunting adaptation including the regulation of brown bear population under control of legal and well-educated hunters of Hunting Associations, as well as the Poľana PLA/BR Administration.

2.3 Agriculture

Agricultural land of the Poľana PLA/BR covers 3 001.4 ha (14.7 %) of the total area. State owned agricultural land represents 428.5 ha, privately owned 202 ha, church 5.3 ha, local communities agricultural land covers 1.3 ha and so far not reclaimed agricultural land covers 2 364.3 ha (78.8 %).

The agriculture in the project area has a long tradition; in the 18th century it represented the main way of living. At the end of the 18th century typical scattered settlements – *lazy* (phonetically resembling word “les” meaning “forest” in Slovak) – were created. Even if these settlements were built up on deforested areas they represent a positive synergetic relation between man and nature. The arable land was gradually compartmentalized into texture of terraces-like fields. Borders that served as infiltration belts, which at the same time protected the soil from erosion and considerably increased the biodiversity and ecological stability of agriculturally managed land, diversified these terraces.



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Especially interesting is the southeastern part of the Poľana PLA/BR that deserves an attention thanks to traditional way of land management preservation. However, poor interest in agricultural land by local people arises problems: the arable land loses its value and at the same time there is a threat that the picturesque and scenic view of the landscape, which is often a destination object of many tourists, will disappear.

The Andosols (Chap. 1.2.3.) as special soils having a tendency to bind phosphorus so tightly that phosphorus base fertilizers are often needed when growing crops on these soils, fortunately they occur in forested areas so the artificial NPK fertilization as a potentially dangerous source of possible eutrofication, is not necessary on arable land.

Agricultural land use

Mountain meadows and pastures are mown and used for grazing cattle and sheep. Although these activities have changed the original floristic composition of these areas to a certain extent, on some the original plant and animal communities were preserved.

Conception of an extensive land use, elaborated by the Poľana PLA/BR Administration and the Research Institute of Grasslands and Mountain Agriculture, seated in Banská Bystrica, was adopted by different state owned farms. The main objectives are to protect flora, fauna, and water resources. The conception contains also rules of land use as for following activities:

- mowing (once a year, using hand scythe or hand power scythe)
- fertilizer use (use only organic fertilizers)
- meadows and grassland management (preserve original flora and fauna composition)
- hurdling (mind regular hurdle relocation to avoid water erosion)

Problems recognized

- management of agricultural land in the Poľana PLA/BR except for the production function must follow the requirements of nature protection, to protect resources of drinking water, preserve biodiversity and at the same time to subordinate to the recreational activities
- It is also necessary to solve completely the problem of land ownership, as most of the land is without ownership ranking

Recommendations

- in times of low yield production the compensatory payments as a form of substitute are proposed. This problem is discussed in the project "National Plan of Rural Development" supported by SAPARD funds
- adjust land ownership the way that abandoned land could be managed without any limitations, except for subordinated to the nature conservation objectives
- subsidized promotion and marketing of local agricultural production as bio-products, development of a visual identity for products from the Poľana Biosphere Reserve

2.4 Tourism opportunities

Tourism isn't the major activity of the project area and it is only a supplementary activity, although the potential is very high. There is only one recreation center, with accommodation for 150 people in the Biosphere reserve (The Poľana Hotel). There are three ski lifts and one



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tennis-court near the Hotel and swimming pool, sauna, bowling rink, and fitness indoors. In the buffer and transition zone there are three localities with a total of 50 cottages and 20 recreation chalets able to accommodate 450 people. The Poľana BR is visited by approx. 13 000 national visitors and 5 000 foreign visitors each year.

Major tourist activities are hiking, cycling, hunting and rock climbing, together with recreation and organization of workshop and seminars in the Poľana Hotel. Also scientific excursions are organized. Rock climbing and cycling is allowed only on selected sites, in accordance with rules accepted by the nature conservation authorities.

The Poľana BR has 120 kms of marked hiking trails and localities (Kalamárka, Chrapková) popular with climbers. Kalamárka Nature Preserve with the 5th level of protection represents the remnant of a volcanic andesite flow. After the removal of pyroclastic material a rock plain was created with ring of turrets, stacks and fortification-like formations reaching height over 10 m. The rock climbing in this area does not represent a threat as rock climbers keep strict regulations. But the use of other rocks formations must be avoided, should any attempt to do so take place in the future.

General observation

- The recreational potential of the project area is higher than it is actually utilized. Therefore, it is necessary to carefully think about what kind of tourist activities in the future and in what extent should be encouraged
- The problem of a potential lack of accommodation facilities could be solved using existing vacant residential buildings in Podolanie region, although it necessary to adapt it to required standards
 - Protection area of the water dam Hriňová, being a part of the Poľana PLA/BR, limits possible recreational and tourist activities, especially in Snohy and Vrchslatina villages as these are not equipped by proper sewage tanks
- Insufficient number of rangers (at present time 1 professional ranger). Lack of rangers due to unattractive financial motivation. Guarding of the protected area is carried out also through the help of "nature patrols" who work on volunteer basis. They have certain authorities but first they have to undergo a special instruction. Possible solution would be to involve students from the Technical University in Zvolen to help with guarding of protected areas as a part of the compulsory practice during their study

Except for individually organized tourism "Mountain Trekking Association", consisting of three organizations - Slovak Cycleclub Poľana in Detva, Hucul Club in Lom na Rimavicou, Slovak Aeroclub in Očová - organizes a number of tourist activities, aimed at target group of people with close relation to traditional values and nature. Its aim is to utilize the potential of the region using "ecologically friendly" way of tourism and at the same time to lead visitors to realize and understand the need for protection of natural and cultural heritage of the region.

Recognized problems

- **Soil-related limitations**

Some limitations are related to the andosol properties. These soils that occur in areas through which lead the most attractive tourist routes lack inner cohesion and exhibit a property called pihotrophy, which mean they can all of a sudden start to behave like a liquid when they contain



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high amount of water and are subject to physical stress. This can cause problems such as erosion, landslides and various engineering problems.

Several field observations of andosol permeability were done. Using the infiltrometer method and classification of soil permeability it can be illustrated that the lowest values of permeability, compared them to the soil permeability value measured under forest stand ($0.3779 \text{ mm}\cdot\text{min}^{-1}$) or ride ($0.231 \text{ mm}\cdot\text{min}^{-1}$), were measured at anthropologically influenced soils (hiking path – $0.022 \text{ mm}\cdot\text{min}^{-1}$; clearing – $0.032 \text{ mm}\cdot\text{min}^{-1}$; skidding road – $0.0159 \text{ mm}\cdot\text{min}^{-1}$). Such soils are more exposed to surface destruction and to the potential erosion. This means that wood cutting and extraction by heavy machinery can raise the runoff by factor 10 and the same holds for hiking and cycling routes.

- **Inconvenient placement of main tourist center (Poľana Mountain Hotel)**

The main stream of visitors is currently coming directly to the heart of the reserve, namely to the Poľana Mountain Hotel, to which there is an unrestricted car access. The visitors load should however be relieved and distributed more evenly over a larger areas, including mainly the foothills and the Skliarovo region in particular. The very attractive route connecting Poľana Mountain Hotel and Skliarovo and offering top quality tourist experience is omitted by tourists due to an entire lack of any, even soft tourist infrastructure. Corresponding infrastructure should therefore be developed in Skliarovo and in Kyslinsky as well (however Kyslinsky locality has already partly been developed by the opening of the Hrochotsky mlyn pesnison. The tourist community has responded to this immediately in a very positive way).

- **Cycling and horseback riding**

The major problem relating to tourism is cycling. Cycling is permitted only on marked cycling trails but cyclists often do not keep to these marked trails and they enter the area of Nature Reserves or National Nature Reserve with the highest degree of protection. Markposts are also often destroyed. Also see soil related limitations.

In terms of horseback riding, Hucul Club in Lom nad Rimavicou organizes horseback riding training, as well as ride routes that can be adapted to the wishes of visitors, either on horses or in the carriage and sledge. According to visitors interests even ox-raid trips are available. According to to-date observations this kind of tourist activity is so far not spread to a degree where it would pose a threat to the integrity of the area.

Recommendations

Any cycling activities must be kept away from trails leading through nature preserves and this policy must be effectively enforced. Also, instructions for bikers should be available to them at the information centers in order to minimize the impact of cycling on the environment. It has been found that the riding technique, such as the way the breaks are being used may be essential. All general rules concerning the use of bikes on trails must be effectively enforced (such as the right of way for hikers and pedestrians).

Re. horseback ride type of tourism must be controlled and not to be allowed to enter areas with the highest degree of protection or valuable sites where biodiversity could be adversely afflicted.



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➤ **Hang-gliding and airplane sightseeing**

Slovak Aeroclub in Očová organizes sightseeing flights above Poľana PLA/BR and its surroundings. Both propeller-driven and aero-town planes (Zlín, L60S, L135W, L13, L23) and gliders are being used and potentially disturb endangered birds' species in their time of nesting by noise or develops stress (shade) from resembling natural predators. The same applies to the hang-gliding activities in the project area.

Recommendations

To make it compulsory for flight providers to consult sightseeing routes, its duration, frequency, flight height, and timing with authorities of the Poľana PLA/BR Administration so possible disturbances can be avoided.

➤ **Skiing**

At present time three ski-lifts are functioning during winter season and there is also a possibility of cross-country skiing. This type of tourism is not dangerous unless skiers use down-hill skiing slopes and stick to paths avoiding localities with the highest level of protection.

➤ **Poľana Hotel visitors**

-organizing of various seminars, workshops and congresses is the main tourist activity in the Poľana Hotel in off-season time. Thus, the biggest threat represents not controlled tourism of large amount of people who "do not know, how to behave in protected area due to the lack of such knowledge" (noise, smoking, etc.)

Recommendations

Provide guided tourism option for short-stay "non-tourists" (workshop and seminar participants) on basis of paid guiding or even make it compulsory for groups with more than 15-20 members to have a responsible guide who guarantees the adherence to the visitors' rules.

➤ **Other types of tourism**

As a certain way of tourism also research activities could be considered.

Research activities

Until the establishment of Poľana PLA only individual scientists carried out research in the region on selected sites according to their own interests. Subsequently, the PLA Administration began to involve various scientific institutions in interdisciplinary research programs. Across the project area 10-km long research transect has been located, including a variety of geological formations, exposures, altitudes, and succession stages of forest as well as non-forest vegetation. In 1991 an interdisciplinary project "Landscape Ecology and Forest Environment of



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Poľana BR for its Rational Management and Use” was proposed. The project main objectives are to monitor the ecological status of the landscape structure, evaluate changes in the basic environmental components (relief, soil, water, air, and forests), and assess human impacts on the landscape, with special attention paid on forest ecosystems and their soils. A further objective is to propose an optimal management approaches for the use of natural resources of the biosphere reserve and neighboring region.

Involved organizations and institutions include Forestry Research Institute in Zvolen, Forestry Faculty and Faculty of Ecology and Environment at the Technical University in Zvolen, Forest Ecology Institute of the Slovak Academy of Science in Zvolen, Department of Surveying in the Faculty of Civil Engineering at the Slovak Technical University in Bratislava,

The Poľana PLA/BR is also a monitoring site within the international cooperative program on the evaluation and monitoring of air pollution impacts on forests organized by the International Union of Forestry Research Organization (IUFRO). Finally, the section of Hučava stream in the reserve has been included in the Slovak participation of the GEOMON (small watersheds) monitoring program.

Students and young scientists also carry out educational research activities. These result in elaboration of diploma works or Ph.D. thesis.

Problems recognized

Research activities or organizing of scientific excursions do not represent any threat to the project area as these activities are done under supervision of well-educated people and behaving respectfully in protected areas.

Potentials for further tourism development

With regard to the geographical position, specific natural conditions, preserved folk traditions and existing manpower resources and according to the SAPARD project “Program for Rural Development” the project area strongest tourist activities represent: hiking, cycling, hunting, horse riding, skiing, agro tourism, presence of mineral springs, rock climbing, and medical – recreational visits. The area is well accessible and it lies in the center of Slovakia with good transportation infrastructure developed. Considering the high unemployment rate of the region it offers potential for development of sufficient manpower working in the tourism industry.

The major hiking trails within the Poľana PLA/BR are led through valleys, mountain meadows, pastures or forested ridges. They offer tourist beautiful views of surrounding mountains, if one is lucky he can watch red deer or roe deer, often are flights of birds of prey, it is also possible to find footsteps of wolf or bear.

Uniqueness of the project area consists in manifestation of particular folk art that is characteristic for this region as for traditional costumes, folklore, songs and dances, habits, as well as handcrafts. Typical for this region is a traditional musical pipe instrument called *fujara*. For the whole landscape is also characteristic terraces-like managing of agricultural land providing beautiful views and ensuring high biodiversity potential of the area as well as carved and colored wooden crosses with motives of nature placed at important crossings.

Another attraction of the project area surroundings is Čierny Balog village. In this village a historical narrow gauge forestry railroad can be found. In the past it served for wood transport



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on the total length of 132 kms. At present the railroad on the distance from Čierny Balog to Hronec (10.4 km) became a state technical monument and it is a favorite destination of tourists.

2.5 Settlements

The whole area is sparsely populated and it belongs among the less urbanized protected areas in Slovakia. There are only three villages (*Iviny*, *Snohy*, and *Vrchslatina*) and few settlements. There are only 400 people permanently living in the area. Most of the 360 permanent inhabitants are retired, and those in employment mainly commute to industrial enterprises outside the region; only few work in forestry or agriculture.

Archeological research has shown that the region was first inhabited in the late Bronze Age, the colonization continued through the Iron Age and was completed in the early Middle Age. From the 13th century, increased immigration and settlement coincided with the progressive mining of ores and precious metals and with the development of metallurgy. The blast furnace built in the village of *Tri vody* in 1792, now conserved as an industrial monument, was one of the earliest in the Hungarian Monarchy of those days.

Since the 17th century intensive human activities have greatly affected the landscape of the Poľana BR. In addition to the expansion of agricultural land and pastures the demand for mining and metallurgy increased exploitation of forests. There was a need to cut forest even in more remote areas from which the timber was transported by floating on the rivers. In the early 20th century a narrow-gauge railway replaced this method of transport.

3. PLANNING AND MANAGEMENT

3.1 Management structure and responsibilities

The Administration of Poľana PLA/BR works through scientifically based management and multilateral coordination of economic activities. According to relevant legislation, the Administration defines policies for all economic sectors, in relation to the demands of nature conservation and with regard to both renewable and rationally exploitable resources. The Administration follows plans elaborated annually and based on long-term objectives. General guidelines for nature conservation are derived from "Territorial Projection of Nature Conservation function" approved by the Ministry of Environment of the Slovak Republic.

The Poľana PLA/BR is directed by the Center for Nature and Landscape Protection of the Slovak Agency of Environment. The Administration is only a specialized organization for nature conservation and it does not represent a juridical subject. Regional Office of Environment regulates any construction activities, resorts of forestry and agriculture, as well as other local activities.

The Poľana PLA/BR Administration structure is as shown on figure below:

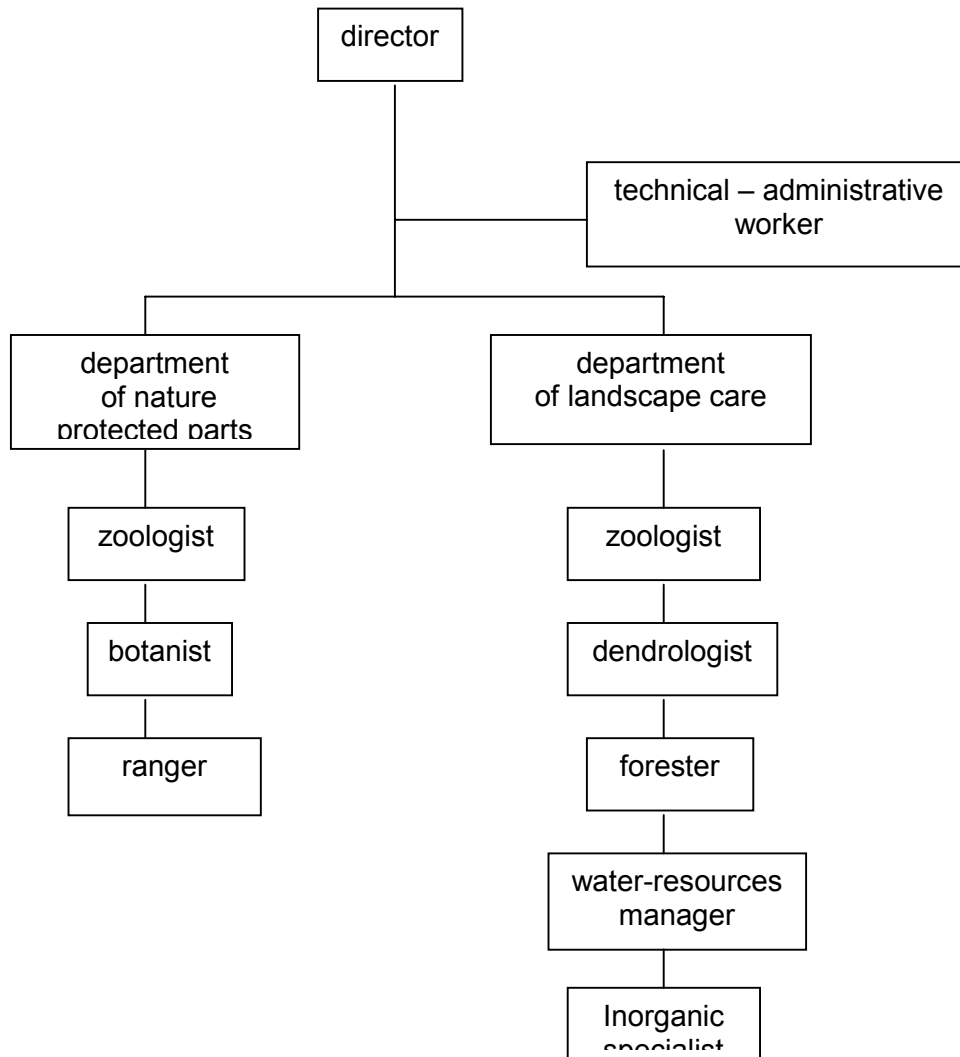


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An essential component in different action coordination is the regional plan of nature conservation and landscape zonation. According to the Seville Strategies the whole area is differentiated into zones. In each zone different management measures are being used. The core zone (1,178 ha) includes six dispersed cores. There is no management allowed in the core zones and they are left to spontaneous natural processes and it also serves for research purposes. Human interference is permitted only according to decisions of a committee, e.g. in the case of a serious natural disaster (windfalls).

The buffer zone (9,183 ha) protects cores and the management subordinates interest of the nature protection, e.g. within forestry natural regeneration should be implemented to preserve the gene pool of local forest trees. The rest of the BR represents the transition zone (9,999 ha)



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in which natural resources are generally managed subordinating the interest of nature conservation and sustainable development.

The Poľana PLA/BR is under the 2nd level of protection. Special attention has been paid to specific sites with rare biotops and endangered communities, which are under a more strict protection level than the rest of the project area. These are managed as small protected areas (23 at present time) covering 1 300 ha (6 % of total area).

3.2 Existing and planned tourism and biodiversity strategies

At present, there are no visitor management plans or local agenda 21 existing for the Poľana PLA/BR. Visitor management plan is under preparation.

Documents elaborated dealing with present state and planned strategies are:

- IUCN Project “Biodiversity Protection in the Protected Landscape Area – Biosphere Reserve Poľana and Management of its Grasslands” aimed at rational and sustainable use of grasslands in the Poľana PLA/BR, 1996
- ”Possibilities of Seville Strategy Implementation in Poľana BR”, 1996
- “Action Plan for Poľana Biosphere Reserve for 2001 – 2002”, aimed at recognition of problems in the field of legislation, biodiversity protection, research, environmental education, management, regional planning, and activities carried out by local authorities, NGOs, associations, 2001
- “Territorial Projection of Poľana PLA” – aimed at analyzing of present state and recommendation of further use of the Poľana PLA area, elaborated in the 70s, updated only for functional areas
- “Regional Territorial System of Ecological Stability” – document dealing with development of natural resources in the ecosystems and the reinforcement of the interconnection between ecosystems
- except for these existing documents the Poľana PLA/BR Administration has accepted “Principles of visitors behavior in the area of the Poľana PLA/BR” subordinating principles of nature protection and sustainable development of the area

Information system

- o information panels were placed at every important entrance to the area of Poľana PLA/BR (Detva, Hriňová, Hrochotský mlyn, chata pod Hrbom, Sihla, Lom nad Rimavicou). Complex view of natural values of the area is available via educational trail “Kyslinky – Zadná Poľana – Kyslinky” opened in 1998
- o KOZA NGO seated in Zvolen (Carpathian Nature Protection Association of Altruists - **Karpatské Ochránárske Združenie Altruistov**) initiated establishment of further information



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localities, available especially in existing tourist accommodation facilities in Hrochotský mlyn, Lodge pod Hrbom, Poľana Hotel as well as in local groceries in Iviny, Sihla and Snohy villages. These localities sell information material about Poľana PLA/BR but people involved are not educated in environment or nature protection and this “information activity” is done on voluntary basis

Cooperation with NGO and voluntary organizations

In Slovak Republic institutions active in tourism industry are Ministry of Economy, Slovak Agency for Tourism, as well as local administrations, institutions, associations, and NGOs. Cooperation of the Poľana PLA/BR with different NGOs and voluntary associations has a long tradition and it results in positive mutual relations.

- **SZOPK (Slovenský Zväz Ochrancov Prírody a Krajiny – The Slovak Union of Nature and Landscape Conservationists**, established in former Czechoslovakia); the branch of SZOPK at the Poľana PLA was established in 1985. Its activities were oriented to a practical help to the protected area (fencing of protected areas on unused agricultural land, inventory researching, removing waste, repairing of haylofts to prevent a traditional way of some agricultural management), as well as to the environmental education (lectures, excursions, discussions).
- **IUCN – active cooperation with the Dutch government on the basis of organization and financing survey of mountain meadows, pastures and grasslands with proposal of their further use.** This survey contributed to the discovery of new species not known in the area up to that time (www.iucn.org).
- **Živá Planéta - Living Planet Civic Association – this NGO coordinates the National Agro-environmental Program for Slovakia and particularly a pilot agro-environmental program involving a part of the Poľana PLA/BR and its adjacent areas.** The program is aimed at promotion of management in abandoned areas due to the agriculture interests decline.
- **KOZA (Carpathian Nature Protection Association of Altruists - Karpatské Ochránárske Združenie Altruistov) – established by employees of the Poľana PLA/BR Administration and students of the Faculty of Ecology and Environment at the Technical University of Zvolen in 1996.** Main objectives of this association are to raise awareness about natural valuable areas and support environmental education of children and local inhabitants. It also promotes sustainable way of farming that helps to protect the biodiversity; it helps to preserve important biotops that are endangered by natural succession due to grazing reduction (most endangered are meadows showing a high biodiversity value, wetlands, fields still using traditional way of farming, organizes working camps where volunteers manually mow the most valuable fragments of plant associations, clean streams, maintain hiking paths, execute nature patrolling, etc. KOZA’s basic principle is that environmental aspect should become an important component of teaching process, as well as of everyday life (www.koza.sk).



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- DAPHNE – main goal of this NGO cooperating with the Poľana PLA/BR Administration is to improve biological diversity and renew the harmony between man and nature, while conserving and restoring the integrity of Central European ecosystems. It participated in the project mapping the grasslands communities in Poľana and it also helped with the nomination for the EUROSITE Award (www.daphne.sk).
- VYDRA – (Rural Development Initiative - **VIDiecka Rozvojová Aktivita**) seated in Čierny Balog – main aim of this NGO is to prevent traditions, cultural and natural values and support sustainable tourism of the Čierny Hron region on the basis of voluntary activities. It is mostly active in environmental education, monitoring of environment, organizing seminars, workshops and cultural meetings to increase awareness of sustainable development of the region (www.vydra.sk).

Other relevant problems recognized and needs for further development

▪ **Legislative**

- update land-use planning in correspondence with nature protection within the Poľana PLA/BR
- update the Poľana PLA/BR zonation according to upgraded Act of the National Council SR No. 287/1994 Coll. of Laws on Nature and Landscape Protection
- complete construction of small protected areas for protection of gene pool and elements of ecological stability

▪ **Biosphere Reserve and management**

- establish gene base for chosen forest stands in order to preserve forest gene resources
- ensure elimination of invasive plant species in protected areas with the 4th and 5th level of protection
- ensure management of wetland areas
- use requirements for nature-close way of forests management with emphasis put on natural regeneration, excluding of clear cuts and growth of not native tree species, and prolongation of regeneration period
- secure more intensive management of abandoned pastures and grasslands
- create post of manager for the Poľana PLA/BR projects and research coordination, cooperation with land owners, authorities and foreign partners
- create post of manager for education and information providing

▪ **Research and environmental monitoring**

- concentrate research on existing research transect and elaboration of research activities synthesis
- monitor rare and endangered species of animals and securing their protection
- ensure inventory of invertebrates
- map medicinal plant species
- ensure inventory of invasive plant species in protected areas with the 4th and 5th level of protection



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- complete and actualize bibliographical papers on the Poľana PLA/BR, edit monographic paper on the Poľana PLA/BR
- build up ozone and imission monitoring stations (their synergetic influence causes damage to the summit section spruce forests)
- monitor water quality on chosen streams within the Poľana PLA/BR
- **Municipality activities**
 - secure cooperation with local authorities
 - clarify property rights and land ownership in correspondence with land use subordinated to nature protection objectives
- **Environmental education**
 - complete the net of information centers and secure their functionality
 - elaborate educational projects for students and local people, use of audiovisual materials for environmental education
 - secure regular distribution of information on activities and new knowledge on the Poľana PLA/BR

4. INSTITUTIONAL AND LEGAL FRAMEWORKS

4.1 Legal frameworks contributing positively to the implementation of sustainable tourism and the conservation of biodiversity

The main problem that currently exists in this field is the fact that tourism development projects or schemes supported or sustained by the Ministry of Economy are not checked on the merits of sustainability and environment-friendliness by professionals educated on biodiversity protection and nature conservation. There is NO co-ordination whatsoever between the Ministry of Environment and the Ministry of Economy. This shall be solved by new legislation to be passed in 2003.

- **Act of the National Council of the Slovak Republic No. 287/1994 Collection of Laws on Nature and Landscape protection**

- nature conservation in Slovak Republic is ensured by adopting the Act No. 287/1994 Coll. of Laws. According to this Act the nature and landscape protection is defined as the prevention and limitation of impacts that endanger, damage or destroy life conditions and forms, nature heritage and landscape features, decrease its ecological stability, as well as the removal of the results of these impacts. Nature protection is also defined as the care of ecosystems. This Act except for categorization of protected areas with particular level of protection defines categories of protected species (plants, animals, minerals, and fossils).
- In 1992 the Convention on Biological Diversity was signed in Rio de Janeiro, the Slovak Republic has signed the Convention in 1993. Slovakia has accepted it as an Article No. 34/1996 Coll. of Laws.
- In the Slovak Republic no Act has been accepted yet dealing with tourism or development of sustainable tourism. Such Act is under preparation and should be



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accepted in 2003. The Ministry of Economy, Department of Tourism, administers tourism industry in the Slovak Republic. There is no interconnection between the Ministry of Economy and the Ministry of Environment as for tourism and feasibility of sustainable tourism development

▪ **Agenda 21**

- Slovakia have positive examples of Agenda 21 rules implementation via self-governments which have understood the importance of sustainable development principles Up to now they are mainly the municipalities and micro regions, especially with “Program of Village Revitalization” which started in 1991. The presented issue includes case studies realized within the frame of significant projects: Support to Sustainable Development in the Slovak Republic (1999 - 2000), Sustainable Towns/Regions in Slovakia (1997 - 2000), and Phare LIEN & Partnership micro projects (1999-2000). Many local authorities are the Local Agenda 21. The Poľana PLA/BR has not elaborated its own Agenda 21 yet.

▪ **Seville Strategy**

- the Poľana PLA/BR Administration has elaborated the “Possibilities of Seville Strategy Implementation in the Poľana PLA/BR”. The document contains objectives dealing with biodiversity protection on regional as well as national level, sustainable use of natural resources, development of research activities and education within the Biosphere Reserve, and monitoring of endangered as well as invasive species

▪ **MAB**

- the Slovak republic has been associated with United Nations Educational, Scientific and Cultural Organization and its Man and Biosphere Program (UNESCO/MAB) since its beginning in 1971(at that time as a part of Czechoslovak Federation). By decision of the Bureau of The International Coordinating Council of the Program on Man and Biosphere, as a part of the UNESCO, the Poľana PLA was recognized as part of the international network of Biosphere Reserves (BR) in 1990

4.2 Institutional framework supporting the planning and management of the protected area

▪ **Agro-environmental Program**

- coordinated by the Living Planet Civic Association, supported by Dutch Ministry of Agriculture, Nature Resources Management and Fisheries and aimed agriculture management in the Poľana PLA/BR and its surroundings to support management of abandoned fields

▪ **Mountain Trekking Association – www.putovanie.sk**

- establishment supported by PHARE Program. Objectives of this association are aimed at tourism development, agrotourism and regional development of Poľana region utilizing its nature potentials and educate people to understand the need to protect natural and cultural heritage of the Slovak Republic



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▪ **Action Plan “Southern Podpoľanie Micro Region Development” (supported by SAPARD)**

- containing information, especially about natural values of the region and its protected areas. The main objective is to ensure harmonic, balanced and sustainable development of microregion, creating optimal conditions for economical growth and decrease of the unemployment rate using the economical, demographical and natural potential of the region

▪ **“Regional Operational Plan for Rural Development of Detva County” (supported by PHARE)**

- containing analysis of region rural development possibilities, the strategy of the development, priorities and financial budget. The main object is to propose a systematic, functional and sustainable development strategy aimed at economical and social development of Detva region

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6. ADDITIONAL INFORMATION

6.1 List of sites of special conservation value

Special attention has been paid to specific sites with rare biotops and endangered communities, which are under more strict protection management than the rest of the Biosphere Reserve. These sites are managed as Small Protected Areas (the 4th and the 5th level of the protection according to the Act No. 287/1994 Coll. of Laws).

National Nature Reserves (NNR)

- **NNR Zadná Poľana**

- the largest NNR, declared in 1972, covering 862.3 ha. It covers the summit section of the Mt. Poľana in altitudes between 900 and 1,458 meters above the sea level. The primeval forest of 160 – 200 years old spruce stands, with admixed rowan and beech offers a spectacular view. Fir, sycamore and elm are also present. The preserve represents the southernmost occurrence of climax spruce forest in the Western Carpathians.

- **NNR Ľubietovský Vepor**

- it covers the ridge between the summit of the same name and Hrb mountain. The reserve was declared in 1967 and its area is 124.6 ha. This reserve is formed by 120 – 170 years old mixed stands dominated by beech and fir and admixed spruce, rowan, sycamore. It is barely disturbed by human activities and thus it has an appearance of a primeval – like forest in some parts.

- **NNR Hrončecký grúň**

- situated near *Hronec* village, declared in 1964. It includes beech and fir-beech communities typical for this region. It is serves for scientific research purposes. Importance of this reserve is emphasized by the fact that it is in the area that is dominated by spruce monocultures. Thus, it represents a possibility of forest transformation to the mixed forest, as it occurred here in the past. In the core zone of this reserve (55 ha) grow trees older than 100 years.

Nature Reserves (NR)

- NR Pod Dudášom
- NR Pri Bútľavke
- NR Vrchslatina
- NR Príslopy
- NR Mačinová
- NR Kopa
- NR Havranie Skaly

Protected Sites (PS)

- Kamenistý potok Meanders
- Horná Chrapková



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- Dolná Zálomská
- Hrochotská Bukovina

National Nature Monument (NNM)

- NNM Bystré waterfalls

Nature Monuments (NM)

- NM Bátovský balvan
- NM Jánošíkova skala
- NM Melichova skala
- NM Kalamárka
- NM Veporské skaly
- NM Spády
- NM Havranka
- NM Brest na Hukave
- NM Buk pod Kl'ukou

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Hereby, we would like to thank Mr. Dušan Slávik, MSc., the director of the Poľana Protected Landscape Area – Biosphere Reserve, as well as employees of the Poľana PLA/BR Administration for their prompt help providing information needed for elaboration of this case study.