

# Зелені Карпати

SPECIAL ISSUE



MAGAZINE ZELENİ KARPATY



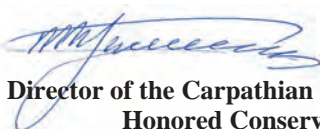


## FIFTY GLORIOUS YEARS

*Dear colleagues, friends and team-mates,  
dear readers of the Green Carpathians Magazine!*

With a special joy in my heart I would like to draw your attention to a significant event: the Carpathian Biosphere Reserve turns 50! For many of us, and first of all – for CBR staff members, this is definitely a remarkable day. The people, the state have entrusted us to act as guardians of the Ukrainian Carpathians, to keep a look-out upon their natural and cultural values. We've lived through numerous victories and achievements, and ahead of us – the same Carpathian mountain peaks, the level of which we are trying to reach with our mind and soul. I sincerely congratulate everyone to whom the Carpathian Biosphere Reserve is not just an institution, but is the forefront of struggle for the environment preservation; I'm greeting everyone to whom it is an object of pride, encouragement and hope. Wishing you best of luck in your personal and professional life, as well as prosperity to you and our glorious hero of the anniversary – the flagship institution in the field of nature protection in Ukraine, which is also widely known all over the world!

Yours sincerely,



**Mykola RYBAK,**  
Director of the Carpathian Biosphere Reserve,  
Honored Conservationist of Ukraine

November 12, 2018  
Rakhiv



## CARPATHIAN BIOSPHERE RESERVE: HISTORY OF FORMATION, ACHIEVEMENTS, PRIORITIES, PERSPECTIVES

**SPECIAL ISSUE ON THE OCCASION OF THE INSTITUTION'S 50<sup>th</sup> ANNIVERSARY**

2018, 12 листопада • 2018, November 12

*Заснований 1994 року.  
Виходить раз на квартал.*

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MAGAZINE ZELENİ KARPATY**

*Founded in 1994.  
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**ВСЕУКРАЇНСЬКИЙ ЕКОЛОГІЧНИЙ НАУКОВО-ПОПУЛЯРНИЙ ЖУРНАЛ  
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Тел. у Рахові – (03132) 2-21-93, в Ужгороді – (03122) 2-05-16

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**Address of the Editorial Office: 90600, Ukraine, Transcarpathian region, town of Rakhiv, Krasne Pleso street, 77**

Telephone number in Rakhiv: (03132) 22193, in Uzhhorod – (03122) 20516

E-mail: [zeleni\\_karpaty@ukr.net](mailto:zeleni_karpaty@ukr.net)

Online version of the Zeleni Karpaty Magazine is available on the website of the Carpathian Biosphere Reserve  
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## MOMENT OF TRUTH:

### QUESTIONARY ON OCCASION OF THE ANNIVERSARY

On the occasion of the 50<sup>th</sup> anniversary of the Carpathian Biosphere Reserve, the editorial office of the Green Carpathians Magazine conducted a kind of a poll to get feedback from both experienced and young team members of the this globally-known protected area, as well as the representatives of the (present and former) Ministry of Ecology and Natural Resources of Ukraine, local authorities, NGOs and wide public, international scientific community, etc. Responding to the anniversary questionnaire, each of the respondents tried to determine their own "moment of truth": when, how and why CBR began to play one of the most important roles in his or her personal life.

1. Your opinion on the place and role of CBR in the global environmental processes.
2. The most important achievements of CBR: past and present.
3. What new directions in CBR's activity should be initiated?
4. Mission of the Carpathian warden: advantages and disadvantages.
5. Your own victories and plans for future.
6. The most memorable event in your life that is related to CBR.

History of our protected area began with the establishment of the Carpathian State Reserve in accordance with the Resolution of the Council of Ministers of the Ukrainian SSR on November 12, 1968 "On establishment of new state reserves in the Ukrainian SSR" – in the territory of Ivano-Frankivsk and Zakarpattia regions, with an area of 12672 hectares.

At that time the Reserve consisted of four isolated massifs, which formed two territorial complexes – Chornohora, with an area of 7938 hectares, and Uholka (4734 hectares). The Chornohora complex was formed by three massifs: Chornohora, Hoverla and Highland, the first of which was located on the southern macro-slope of the Chornohora mountain ridge, and the last two – on the northern one.

In this form, the reserve had existed until 1979, when it was expanded according to the Resolution of the Council of Ministers of the Ukrainian SSR dated on December 12, 1979 by adding the state landscape reserve "Shyrokyi Luh", covering an area of 5616 hectares, and also a botanical reserve "Narcissi Valley" with an area of 256.5 hectares. The total surface of the Carpathian State Reserve's area had thus increased to 18 544 hectares. However, in 1980, two mountain massifs on the northern macro-slope of the Chornohora mountain range were withdrawn from it, which formed the core zone of the newly created Carpathian State Nature Park with an area of about 50 000 hectares. After such a reorganization, the Carpathian State Reserve lost its representativeness as a mountain reserve, because the unique high-altitude complexes got to be located outside its territory. The scientists and rangers began a new phase of their struggle for expanding and optimizing the territory of the Reserve. In the first place, it was proposed to attach the subalpine and alpine zones of the Chornohora massif, which at that time suffered from excessive grazing, and also to expand the Chornohora field division at the expense of valuable sycamore and sycamore-beech primeval forests on the slopes of Petros Mt., and some spruce forests in the western slopes of Hoverla Mt.

The next phase of expansion began in the late 80's, during which it was possible to achieve most of the defined objectives. Thus, in 1990, in accordance with the Resolution of the Council of Ministers of the Ukrainian SSR dated on May 30, 1990, two new massifs were included into the Reserve: the Maramures massif



with an area of 3155 hectares, and Kuziy with an area of 747 hectares, and also that expansion phase considerably expanded the existing Chornohora field division (by 2577 ha) and the Uholka-Shyrokyi Luh division (by 633 ha). To the Chornohora field division there was finally included a high-altitude plot on the southern macro-slope of Hoverla Mt., and it got enriched with valuable forest sites on the slopes of Petros Mt., and the Uholka-Shyrokyi Luh, due to the added territories, formed a single natural-territorial complex with the largest continuous primeval beech forest massif in Europe on the area above 11 000 hectares.

In 1993 a new era started in the history of CBR – according to the Decree of the President of Ukraine "On Biosphere Reserves in Ukraine" dated on November 23, 1993, as it received a status of a biosphere reserve and entered the UNESCO World Network of Biosphere Reserves. At that time, the Law "On the Protected Area System of Ukraine" was already in force, which was regulating all the aspects of the biosphere reserves activity. That Law envisaged a differentiated regime of protection, restoration and use of the biosphere reserve's natural complexes in accordance with the functional zoning of its territory.

In 1997, on the basis of the Svydovets landscape reserve of the national significance and the natural botanical monument of the national significance "The Cliffs of Blyznytsia", in accordance with the Decree of the President of Ukraine "On the expansion of the territory of the Carpathian Biosphere Reserve" dated on April 11, 1997, a new high-altitude Svydovets field division, and the Chornohora, Maramures, Uholka-Shyrokyi Luh and Kuziy divisions were considerably expanded, and also botanical reserves of the national significance "Chorna Hora" and

# CARPATHIAN BIOSPHERE RESERVE THROUGH THE PRYSM OF FIVE DECADES

**Mykola RYBAK**  
*Director of the Carpathian  
Biosphere Reserve*  
*Honored Conservationist  
of Ukraine*

"Yulivska Hora" were added to its territory. As a result, the territory of the Reserve had increased up to 57 880 hectares. A few years later, Stuzhytsia division was withdrawn from the Reserve, which, in accordance with the Presidential Decree dated on September 27, 1999 was given to the newly-established Uzhanskyi National Nature Park.

An especially important date for the life of the biosphere reserve is June 28, 2007, when the UNESCO World Heritage Committee at its 31<sup>st</sup> session in the city of Christchurch (New Zealand) decided to include the Ukrainian-Slovak nomination "Primeval Beech Forests of the Carpathians" with the total area of 29278.9 hectares into the UNESCO World Heritage List. 70% of the Property belonged to the Carpathian Biosphere Reserve.

The subsequent reorganization of the territory of CBR took place in early 2010, when (in accordance with the Decree of the President of Ukraine dated on January 14, 2010, No. 25 "On the expansion of the territory of the Carpathian Biosphere Reserve"), some sites on the north-eastern macroslope of Hoverla Mt. became parts of the reserve, and the area of such protected massifs as Chornohora, Svydovets and Maramures was significantly enlarged. As a result, today the total area of CBR is 58035,8 hectares, 39485,8 hectares of which are under the reserve's direct management, and some 18550 hectares are managed other land users under the Reserve's supervision.

Today, the CBR Administration is actively working on the next stage of the boundaries expansion. This time in Tiachiv district, which will increase its area almost by 9 000 hectares, first of all by adding some unique primeval beech forest sites.

In accordance with the Management Plan, the whole territory of the Reserve is divided into 4 functional zones.

The core zone includes 23674 hectares, representing 40.8% of the Reserve's area, the buffer zone covers 15671 hectares, representing 27% of the territory respectively, and 17620 hectares are included into the zone of anthropogenic landscapes, which makes up 30.4% of the territory of the Reserve. The zone of regulated protection covers 1071 hectares, which is 1.8% of the territory.

But this did not finalize the territorial optimization of the Carpathian Biosphere Reserve.

Thus, at the end of 2013, the administration of the biosphere reserve prepared and submitted a periodic review for MAB UNESCO BRs for a ten-year period.

The international Coordinating Council of the "Man and Biosphere" Program of UNESCO adopted its Decision based on the results of the periodic review in June 2014 regarding the Carpathian Biosphere Reserve, containing the following items:

- The Council positively evaluated the periodical review prepared by the Carpathian Biosphere Reserve and pointed out at a valuable support given by the national government in the process of the second periodic review submission providing information on the given biosphere reserve from the moment of its creation;

- The Council concluded that this protected area did not fully meet the criteria set out in the Statutory Framework for the World Network of Biosphere Reserves;

- The national authorities are also asked to review zonation of the biosphere reserve in accordance with the criteria, provided in the Statutory for the World Network of Biosphere Reserves.

In order to implement the above-mentioned Decision of the International Coordination Council of the UNESCO program "Man and Biosphere", the administration of the reserve began intensive work on the formation of the transition zone of CBR in spring 2016. As a result, in 2016, the territorial structure and, accordingly, the zonation, were upgraded to the requirements of the Statutory Framework for the World Biosphere Reserve Network criteria. The inconsistency with the above criteria was due to the insufficient size of the transition zone, which was caused by the clustered nature of the territorial structure, and consequently a significant fragmentation of the area and low ecological integrity and connectivity. The administration of the institution has reached an agreement with the Zakarpattia Regional Forestry and Hunting Administration on establishing the transition zone for the Carpathian Biosphere Reserve in the territories of



One of the buildings of the Central Office of CBR

state forestry enterprises that are under its control. By creating the transition zone, or the "area of sustainable development", as it is named in the Memorandum on Cooperation with the Zakarpattia Regional Department of Forestry and Hunting on the transition (sustainable development) zone designation within individual state forestry enterprises in order to ensure forest management based on the principles of the region's sustainable development.

In addition to the aforementioned memorandum, in 2016-2017, the administration of the Reserve signed a Declaration on cooperation between the biosphere reserve and a number of town and village councils. The subject of the Declaration is inclusion of their territory into the transition zone (the territory of the sustainable development) for the Carpathian Biosphere Reserve as required by the UNESCO Man and Biosphere Program. As of December 31, 2017, such declarations were signed with the territorial communities of the following settlements: Rakhiv, Bohdan, Luh, Vydrychka, Roztoky, Lazeshchyna, Yasinia, Chorna Tysa, Kvasy, Bilyn, Kostylyvka, Dilove, Luh and Kosivska Poliana of the Rakhiv district, and Uhliа, Shyrokyi Luh and Velyka Uholka of Tiachiv district.

The aforementioned state forestry enterprises and territorial communities form a transition zone with a total area of 136.900 hectares. The newly-created area of CBR is a holistic object now with

no fragmentation, with a high ecological connectivity and integrity, and this fact ensures, in particular, the conditions for the existence of viable populations of large predators: bear, wolf and lynx. It is important to note that the territory of the transition zone includes a significant part of the ecological network of Zakarpattia region, in particular all the latitudinal and meridional ecological corridors that interconnect those cluster areas of the biosphere reserve, which have a conservation status. All these clusters have a classical zonation, that is, they include protected areas separated with buffer zones from the transit area, or the external boundaries of the biosphere reserve.

Thanks to the work done during the 29<sup>th</sup> session of the International Coordination Board of the Man and Biosphere Program (June 12-15, 2017, Paris), there was a decision made taken as for the full compliance of the CBR's territorial structure with the criteria of the Statutory Framework of the World Network of Biosphere Reserves, which had deprived the institution of the threat of being excluded from the aforementioned international network and the consequent loss of its international status.

Thus, the Carpathian Biosphere Reserve, together with the transition zone of 136.900 hectares, covers an area of over 195 000 hectares and is one of the largest biosphere reserves in Europe.

The Carpathian Biosphere Reserve today is also one of the largest protected areas in Ukraine that protects unique natural and anthropogenic landscapes from the Transcarpathian foothills up

to subalpine and alpine zones of the Ukrainian Carpathians.

In the reserve's ecosystems 1779 species of vascular plants, 806 species of lichens, 436 algae species, 980 species of fungi, 66 species of mammals, 193 species of birds, 9 species of plantations, 15 species of amphibians, 29 species of fish and more than 3 000 species of invertebrates are under protection.

Many of them are included in the Red Book of Ukraine, the International Red List, the European Red Lists and are protected by the International Conventions.

The activity of the Carpathian Biosphere Reserve is highly appreciated both in Ukraine, in Europe and in the world.

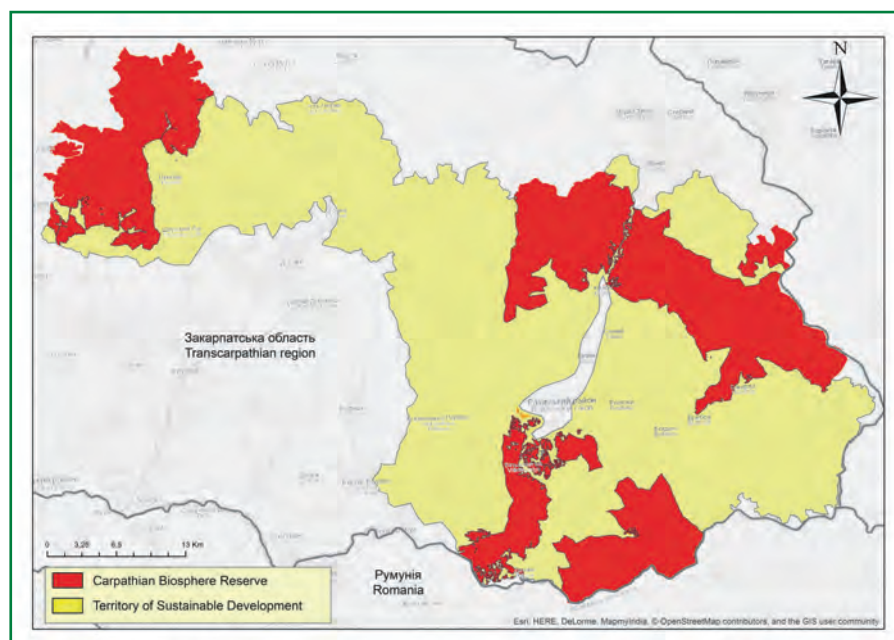
Thus, in 1997, 2002, 2007 and 2012, for the outstanding achievements in preservation and research of the natural complexes of the Ukrainian Carpathians, the Council of Europe awarded the Carpathian Biosphere Reserve with the European Diploma for Protected Areas.

The most important achievement of CBR is the creation and expansion of the UNESCO World Heritage Property, where primeval beech forests of the reserve (an area of almost 21 000 hectares) are its largest components. More than 22% of the territory of Pan-European UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and other regions of Europe" are protected at CBR.

An audit of protected areas conducted by the European Wilderness society was an important step too. According to the results of the audit held for the Uholka-Shyrokyi Luh and Kuziy-Trybushany massifs last year, the two sites of CBR became parts of the European Wilderness Network. The aforementioned areas received the corresponding certificates, and the territory of the Uholka-Shyrokyi Luh massif, where the largest component of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and other regions of Europe" is also located, has received a certificate the highest level – platinum.

Throughout its existence, the Carpathian Biosphere Reserve has become an internationally recognized protected area known for its prominent research and regional development activity, that has made a significant contribution to the conservation of natural ecosystems and sustainable development of the Carpathians, as well as into the formation of an ecological network and the development of nature conservation in Ukraine. There was created a rather powerful environmental, research,

Map of CBR with the "territory of sustainable development" – the transition zone





## Hoverla – the highest peak of the Ukrainian Carpathians

environmental, educational and economic infrastructure at the reserve. There are more than 60 constructions here of different purpose, over 140 km of roads and more than 350 km of mountain paths are maintained by CBR, although, unfortunately, due to the low funding level in recent years it is becoming increasingly difficult to maintain the existing infrastructure in an appropriate technical condition. Great expectations in this direction we lay on the German-Ukrainian project "Support for the Nature Protected Areas of Ukraine".

In order to ensure the protection of the reserve, a ranger service has been established numbering to 150 people. Its structure includes 11 field divisions, the department of ranger service and the management (director and the first deputy director).

The employees of the State Protection Service (the ranger service) of the field divisions work on a flexible schedule to provide proper protection, patrolling the territory by the defined routes, working on shifts at checkpoints, deal with law enforcement structures and perform the required environmental, eco-education, recreation and economic measures within the limits of the area under their supervision.

Scientific research in the reserve is carried out on the basis of the Regulation on the scientific and technical activity for nature reserves, biosphere reserves and national nature parks conducted by staff members of their scientific laboratories and departments. The main research topic is the Chronicles of Nature – an annual scientific report of any protected area in Ukraine. 41 volumes of the Chronicles of Nature have been issued by CBR throughout its existence.

Over the years, the Reserve has organized dozens of international scientific conferences and has participated in the implementation of numerous international scientific projects.

Ecoeducational activity of the Carpathian Biosphere Reserve is provided by the Department of Ecological Education, the Department of Recreation and Sustainable Development, and the Editorial and Publishing Department created for scientific and popular science publications. In order to popularize the reserve, as well as with ecoeducational purposes, CBR regularly issues the All-Ukrainian Ecological Popular Science Journal "Green Carpathians" (Zeleni Karpaty), the newspaper "Newsletter of the Carpathian Biosphere Reserve" and constantly updates the range of booklets, leaflets, tourism maps, calendars and other handouts.

Since 2016, the "Nature of the Carpathians" has been issued. It is an annual scientific journal published jointly by CBR and the Institute of Ecology of the Carpathians of the National Academy of Sciences of Ukraine (Lviv).

The reserve has developed a solid infrastructure for the implementation of ecoeducational and recreation activities. Since 1994, a great eco-education center – the Museum of Mountain Ecology and History of Nature Use in the Ukrainian Carpathians, which has no analogues in Ukraine, has been operating on the basis of the institution. Over the past 10 years, the information infrastructure of the reserve has been significantly expanded. Now there are three ecoeducation centers (the above-mentioned Museum of Mountains Ecology, the Museum of Narcissus and the visitor center in the Center of Europe) and four tourism information centers ("Carpathian Highlands", "Keveliv", "Carpathian Trout", "Primeval Beech Forests as the UNESCO World Heritage

Property") at the reserve. There are 18 ecotourism trails and 45 recreation areas in the territory of CBR.

Regarding the support of traditional nature management and implementation of sustainable development projects, it should be noted here that the Carpathian Biosphere Reserve, in accordance with the current environmental legislation and the institution's spatial structure, enables the local population to conduct the free-of-charge nature use activities in the zone of anthropogenic landscapes, such as hay mowing, cattle grazing and picking up mushrooms and berries for own consumption. The reserve provides furl wood by affordable prices to the population both for heating of their own houses and the timber needed for the maintenance of highland farms.

So, the Carpathian Biosphere Reserve with the team of about 300 people, confidently continues to solve the challenges set before it. The work of all the structural subdivisions is arranged in a way which makes it possible to fulfill the main tasks, and the administration of the reserve gradually implements the measures aimed at improving the logistic support of its structural units and the ranger service. The research, nature protection, ecological, education and recreation activities are being conducted at the appropriate level, and the support of traditional nature resource management is granted to the population. This year, it is planned to complete the development of a new management Plan, and to prepare forest management materials for the institution, as well as to complete the process of uploading information on CBR's lands to the State Land Cadaster, which is extremely important for the further stable work of the reserve.

And I hope, that many more new achievements and victories are awaiting us in future.

## THE ESSENCE OF BIOSPHERE RESERVES, THEIR POLYFUNCTIONAL SIGNIFICANCE AND THE GLOBAL NETWORK

*Stepan STOIKO,  
Doctor of Biological  
Sciences, Professor,  
Honoris causa Doctor  
of the Zvolen Technical  
University (Slovakia)  
and the Lviv State University  
of Life Safety*



*The opinion  
of nature  
conservation  
patriarch*

A characteristic feature of the biosphere is the availability of biological, ecosystem and landscape diversity, which has been formed during a geologically long evolution process and provides its homeostasis. As a result of various types of anthropogenic / technogenic impacts on the biosphere, a number of significant changes have taken place that negatively affect its natural diversity. Therefore, preservation of the latter is an important environmental challenge. The most reliable preservation of the natural diversity can be insured in national parks, nature reserves of other protected areas. According to the UNESCO MAB Commission, they occupy 11% of terrestrial area in different countries of the world. In today's technogeneous age, the impact of man on the natural environment will be aggravated and it is unlikely that it is possible to save the natural diversity on Earth only within particular protected areas. Therefore, it is necessary that in the ecosystems of economic / resource management importance a non-exhaustive and renewable regime of natural resources use is ensured, which would promote the conservation of natural diversity of the biosphere at the same time ensuring sustainable socio-economic development on the planet. To ensure this, it is

necessary to have a reliable reserve / stock of natural territories and resources on Earth. That is why the UNESCO MAB Commission in 1974 justified the need to create a world network of biosphere reserves (BRs).

By their functional purpose, the biosphere reserves differ from national parks, nature reserves and other categories of protected areas. Their purpose is to combine passive forms of environmental protection (conservation regime) with active forms of protection through environmentally-friendly methods of using and restoring natural resources [1]. Considering these multifaceted objectives of BRs, there was created the World Network of biosphere reserves under the auspices of the MAB UNESCO on the basis of national and international conservation programs. A biogeographer of the University of California (USA) Prof. Udvardi identified 8 biogeographic kingdoms on the planet, as well as 193 biogeographic provinces and 360 biogeographic regions [2]. The Carpathian mountain system is one of the identified regions. It is desirable that the biosphere reserves are created in each biogeographic region. They are intended not only to preserve natural ecosystems and landscapes of different types and their biological diversity, but also to justify the ecological principles of optimization of

economic systems – agro-ecosystems, forest ecosystems, aquatic ecosystems. Therefore, the biosphere reserves are created not only on terrestrial parts of the globe, but also in coastal zones of the oceans and various marine ecosystems.

According to UNESCO MAB data, 669 biosphere reserves were created in 120 countries as of 2016. In 28 countries in Africa there are now 70 BRs, in 11 Arab countries – 30 BRs, in 24 countries of Asia and the Pacific region – 143 BRs, in 36 countries of Europe and North America – 302 BRs, in 21 countries of Latin America and the Caribbean – 125 BRs. Given a huge environmental and economic importance of biosphere reserves in ensuring sustainable development, their network continues to expand.

In the transboundary areas of some countries there are areas valuable in terms of their ecological and biogeographical aspects. In order to preserve them, the UNESCO recommends establishing bilateral biosphere reserves there. The world network of such transboundary biosphere reserves includes: the Tatrzański Polish-Slovak BR (1992); Polish-Czech "Karkonosze" (1992); Romanian-Ukrainian "Danube Delta" (1998); French-German "Pferzwald" (1998); Ukrainian-Slovak-Polish "East Carpathians" (1998). In Africa, this network includes a trilateral BR on the border of Benin, Burkina Faso,



Nigeria (2002). The Ukrainian and Polish sides are preparing the justification for creation of a bilateral biosphere reserve in Roztochchia on the basis of the Polish national park "Roztoczański park narodowy" and the Ukrainian biosphere reserve "Roztochchia". In the Eastern Carpathians along the Romanian-Ukrainian border the Maramures mountain massif is located, which is unique in their biogeographic aspect. There is a real possibility to create a Romanian-Ukrainian biosphere reserve here.

On the territory of Ukraine, biosphere reserves (BRs) began to be created after the proclamation of the country's independence. The Verkhovna Rada (Parliament of Ukraine) adopted in 1992 the Law of Ukraine "On the Protected Area System", which defined 7 categories of protected areas: nature reserves, biosphere reserves, national nature parks, regional landscape parks, nature sanctuaries, monuments of nature, protected tracts (forest, steppe, boggy sites, etc.).

According to the valid Legislation, biosphere reserves are the nature conservation and research institutions of international significance, which are created for preservation of the most typical natural complexes of the biosphere in their original state, as well as for carrying out environmental monitoring and research of the natural environment, for ensuring an efficient use of natural resources and environmental safety. Today, in various natural-geographical regions there are such biosphere reserves as: the Black Sea BR (109,254 hectares, the marine area of which is 89,129 hectares); Askania-Nova (33307 ha); Danube (50252 ha); Carpathian BR (58025 ha); Polish-Slovak-Ukrainian East Carpathians TBR (it includes the Uzhanskyi NPP – 39159 hectares and the Nadsianskyi RLP – 58587 hectares); Ukrainian-Belorussian-Polish TBR "Western Polissia" (it includes the Shatskyi NPP – 48,997 hectares, the transboundary NPP "Desna" – 58,293 hectares, and the Roztochchia biosphere reserve – 74,416 hectares); the Chernobyl radiation-ecological biosphere reserve – 226964 ha.

According to the MAB UNESCO Program, the World Network of Biosphere Reserves is intended to fulfill the following tasks: to ensure conservation of the natural ecosystems that are representational for the biogeographic regions of the Earth and which play the role of reference models for the re-naturalization of

degraded landscapes; creating favorable environmental conditions for plant and animal species gene pool conservation, and for a spontaneous development of ecosystems in their natural environments; providing a scientific basis for comparative studies of both natural and cultural ecosystems, as well as for transformed ecosystems / landscapes and their respond to various types of anthropogenic impacts; substantiation of environmental principles in natural resource management and optimization of the natural environment; ensuring the natural and cultural ecosystems' monitoring in the light of technogenic impact; maintenance of ecological balance in the regions of BRs location; promotion of environmental education of the population; for ensuring international co-operation in the sphere of environmental protection.

In order to ensure the implementation of their environmental, economic, and social objectives, the territory biosphere reserves is divided into three zones that are different in their functionality: the core zone of a BR; buffer zone around the core area (buffer zone); transition zone (for management activities). The strictly protected core area includes the ecosystems representational for a certain biogeographic region that are suitable for a long-term environmental research and monitoring of natural processes. The core area's ecosystems serve as natural reference models for optimization of the cultural ecosystems within BRs' transition zone. A buffer zone, clearly delineated around the core area, is designed to protect

the strictly protected part of a BR from adverse effects, as well as for carrying out environmental education activities, ecological education and ecotourism development.

The largest and most diverse in its purpose is the transition zone of biosphere reserves, which includes various agricultural, forestry and water management areas with traditional management of natural resources. This zone may include both transformed and degraded sites that are worth to be re-cultivated for restarting management there. The table (see page 8) shows the multifaceted tasks of biosphere reserves and differentiated protection regimes in the respective zones. Such a principle is used in the Carpathian Biosphere Reserve's zonation [3].

In 1983, MAB UNESCO and UNEP held the World Congress of Biosphere Reserves in Minsk, where the Plan of differentiated environmental measures at BRs was approved. In 1992, in Seville, the International UNESCO MAB Conference on BRs was held, which approved the Strategy on the World Network of BRs and the expansion of their scientific, socio-economic and educational functions.

In terms of methodology, when creating either national or international BR network, we need to take into account the following ecological and conservation challenges: a) integration of biogeographically valuable and representational ecosystems within their territory, along with men-made ecosystem for the sake of optimization of the latter;



Landscapes of the Uzhanskyi National Nature Park  
(East Carpathians TBR)

b) national, bilateral and international approach in organizing BRs' network, which should be representational for both certain regions of countries and for the biogeographic regions of the Earth; c) ensuring monitoring of man-made impact on the Earth's geographic layer based at BRs both on the country and global levels; d) informational openness of BRs and promotion of international co-operation in the sphere of technogenic impacts mitigation.

The ecological strategy of biosphere reserves lies in the fact that that they function not as units isolated from the surrounding ecosystems and natural

complexes, but operate in social and economic integration with them. Thus, there is a new idea of nature conservation strategy in the essence of biosphere reserves – a combination of environmental protection through a strict conservation regime with environmentally justified sustainable non-exhausting natural resource management.

During the process of BR network establishment in Ukraine, there was an inconsistency between their objectives if we compare the MAB UNESCO's vision and the Law of Ukraine on the Protected Areas Network. The English version of the term "a biosphere

reserve" means preserving a certain stock of biosphere, ensuring sustainable socio-economic development in the countries around the world. In the Law of Ukraine the biosphere reserves are officially called "biosphere zapovidnyk" ("a zapovidnyk" – a strict reserve, a concept inherited from Soviet times), as adopted by the President's Decree. According to the Regulations on the Protected Areas Network of Ukraine, a reserve-zapovidnyk should provide full protection of natural ecosystems. In the biosphere reserve this protection refers only to its core and buffer zones. In the largest – transition – zone of a BR it is recommended to pursue measures aimed at optimizing traditional farming, forestry, water management etc. The term "biosphere zapovidnyk" as adopted in Ukraine does not correspond to the essence of the "biosphere reserve" as understood by UNESCO MAB.

In the English literature and international publications on nature conservation, the term "zapovidnyk" does not have an equivalent substitute, which creates certain difficulties at international scientific conferences and in preparations of scientific publications on conservation topics. That's why it is needed to adopt the international name for



**Tarnytsia Mountain  
(Bieszczady National Park, Poland) –  
East Carpathians TBR**

**NATURALNESS STATUS AND FUNCTIONAL APPLICATION  
OF INDIVIDUAL ZONES IN BIOSPHERE RESERVES**

Table

Name and abbreviation of BR zones	Naturalness of the ecosystems	Role in biodiversity conservation	Eco-functional application		Protection regime
			Priority	Potential	
Core area, A zone	Primeval ecosystems, not disturbed by human impact	Significant	Ensuring absolute protection, scientific value, basis for monitoring	Sustainable development, a basis for ecoeducation	Absolute protection
Buffer zone – B	Ecosystems are partially altered, capable of regeneration either spontaneously, or with the help of people	Medium importance	Protecting zone "A", restoration of natural ecosystems	Experimental application, research, ecoeducation, recreation, ecotourism	Regulated
Transition zone – C	Cultural ecosystems of economic importance that need to be optimized	Insignificant	Economic; promotion of sustainable development, preservation of ethnic-cultural values, recreation, ecoeducation	Ecologically-substantiated traditional management of natural resources	Regulated

a biosphere reserve – "rezervat" for the biosphere reserves in Ukraine, and bring in corresponding changes in the Law of Ukraine on the Protected Areas System. For each biosphere reserve, depending on the nature of the geographical region in which it is located, it is necessary to elaborate a differentiated regime of management and protection and to substantiate the system of nature resource management for its transition zone.

In the modern technogenic age, the effects of the impact caused by technosphere are visible in the global scale. In the biosphere we can witness irreversible processes of biological diversity loss, chemical pollution of hydrosphere, pedosphere, and atmosphere, as well as destruction of the ozone layer, and global warming of the climate has begun. They pose a threat not only to our generation, but also to future generations of the global community.

In order to define potential changes in the biosphere, and for justification of effective conservation measures, it is necessary to organize a global monitoring network for the ecological status of all the units of the biosphere – lithosphere, hydrosphere, pedosphere, atmosphere, plant and animal world – on the basis of biosphere reserves. To assess the technogenic impact on the natural environment in Ukraine, such monitoring should be organized on the basis of biosphere reserves located in various natural geographic localities. The objective information obtained will be important for substantiating environment conservation measures, rational use of natural resources, and for ensuring sustainable socio-economic development.

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## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



**Dr. Hannes KNAPP**  
*Professor, deputy chairman of  
the Michael Zuccow Foundation,  
Greifswald, Germany*

1. CBR is a member of two international UNESCO networks of global importance: the World Network of Biosphere Reserves and the World Heritage network. With an appropriate zonation and a successful implementation of the management objectives (such as protection of primeval and oldgrowth forests, sustainable development of rural areas), as well as with its well-developed relationships with local authorities, national governments, non-governmental organizations and the international scientific community, it is an example of an excellent practical implementation of conservation objectives at the European level.

2. Serious level of primeval forests protection and permanent management based on the principle of non-intervention into the core area, despite the sustained resistance and lobbying of forestry enterprises; involvement and participation of people, education of children and young people, as well as raising awareness of the public about the necessity of primeval forests protection and preservation of natural values; the nomination of primeval forests to the UNESCO World Natural Heritage, as well as European networking initiatives and cooperation on scientific, technical and political levels.

3. We live in a period of global changes, many of which are devastating. Nature conservation activities are aimed at protecting the environment as the most important basis of human life. The search for new approaches and directions is becoming increasingly important in environmental protection.

CBR has a well-defined approach to the primeval forests protection, as well as to sustainable development of rural areas. These are permanent challenges. Do not change your successful direction! A biosphere reserve development is a long-term process.

6. Oh, there are lots memorable events here, for example, in 2003 – an international conference in Mukachevo, to which I arrived without any visa, as well as my first impression from the primeval forests of Uholka; 2007 – the first trilateral meeting on the island of Vilm, and further pan-European cooperation; 2009 – the flowering Narcissi Valley and the Hutsul Festival; 2017 – an exciting meeting with schoolchildren in Rakhiv...





**Mykola RYBAK,**  
*Director of the Carpathian Biosphere Reserve,  
Honored Conservationist of Ukraine*



**Yuriy BERKELA,**  
*Head of the Department,  
PhD in Physics and Mathematics*



**Vasyl POKYNCHEREDA,**  
*Deputy Head of the Department,  
Secretary of the Natural Heritage Sector of the National Commission of Ukraine for UNESCO*

**D**epartment of scientific research and international cooperation of CBR, as a structural unit of the Carpathian Biosphere Reserve, was created back in 1996. From 1996 to 2003, it functioned under the name "research laboratory of GIS data processing and analysis", on the basis of which in 2011 a department of research and sustainable development was designated. In January 2018 the division was renamed.

During this time a lot of talented and creative people worked in the department, and the outcome of their activity is obvious today. It is impossible not to forget mentioning Aleksey Taut, who initiated the introduction of GIS in the institution during the implementation of the GEF project "Conservation of Biodiversity of the Carpathians" (1995-1996), or Yaroslava Reshchuk, who gave a new breath to support the highland farming activities on the territory of CBR, and many others.

The Department of Scientific Research and International Cooperation is a structural research unit of the Carpathian Biosphere Reserve and acts as an organizing link in implementation of scientific research and international cooperation by the institution. It provides scientific knowledge, analysis and generalization of information, creation and maintenance of databases and information systems, processing of research results; it develops and implements national and international scientific projects on nature protection,

biodiversity conservation, sustainable development, environmental research, etc.; the Department provides organizational support of international cooperation of the institution; ensures the organization and implementation of:

- recommendations and decisions/resolutions: of the International Coordinating Council for UNESCO "Man and Biosphere" (MAB) Program; the UNESCO World Heritage Committee; the Council of Europe regarding European Diploma for Protected Areas, as well as the preparation of relevant periodic reports;

- the provisions of the Conventions: the World Heritage Convention; the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat; The Bern Convention on the Conservation of European Wildlife and Natural Habitats (regarding) the Emerald Network), etc.;

- UNESCO Man and Biosphere Program Documents (Statutory Framework for Biosphere Reserves, Seville Strategy, Lima Action Plan).

It also ensures operation of the geographic information system's components and CBR's website maintenance, installation of software for scientific units etc. It updates digital mapping database.

The department is active in many directions important for the Biosphere Reserve. Among them, in particular:

1. UNESCO Biosphere Reserve.
2. Implementation of sustainable development concept.
3. UNESCO

4. Extension of the territory of the reserve.
5. Primeval and oldgrowth forests identification.
6. Cross-border cooperation, in particular – designation of a transboundary biosphere reserve in the Maramures Mountains.
7. Collaboration with the European Wilderness Society.
8. Wetlands of international importance.
9. Framework Convention on the Protection and Sustainable Development of the Carpathians (Kyiv, 2003).
10. Diploma of the Council of Europe for protected areas.
11. Organization of internship tours and professional exchange trips for students of the leading European universities.

## UNESCO BIOSPHERE RESERVE

Since 1993 the Carpathian Reserve is a member of the World Network of Biosphere Reserves MAB-UNESCO. Today it covers an area of 58,035.8 hectares, 31977 hectares of which are under its direct management, 18550 hectares belong CBR without withdrawal from land users, and 7508,8 hectares of land are given under protection of the institution in accordance with the Decree of the President of Ukraine "On the expansion of the Carpathian area Biosphere Reserve" Nr. 25 dated on January 14, 2010. CBR's territory consists of eight isolated natural massifs that are located in the territories of Vynohradiv, Rakhiv, Tiachiv and Khust administrative districts

# KEY FIELDS OF ACTIVITY OF THE CARPATHIAN BIOSPHERE RESERVE

## DEPARTMENT OF SCIENTIFIC RESEARCH AND INTERNATIONAL COOPERATION

of Zakarpattia region. The Carpathian Biosphere Reserve (CBR) is located within the altitudes of 180-2061 m a.s.l. – from the Transcarpathian lowlands to the alpine zone, and represents almost all the altitude zones that are characteristic of the southern macro-slopes of the Ukrainian Carpathians.

CBR serves as both a classical protected area on the national level – "zapovidnyk" – and a UNESCO biosphere reserve. The difference between these structures is very fundamental. The Biosphere Reserve-Zapovidnyk is a protected area that functions in accordance with the Law of Ukraine "On the Protected Area System of Ukraine" and has rather severe restrictions on the use of natural resources in its territory. Instead, world network's biosphere reserves are international structures created within the framework of the UNESCO Man and Biosphere Program (MAB). They include both protected areas and a large transition zone. This part of the Biosphere Reserve has no special conservation status and is created with the aim of the sustainable development concept's implementation here. It includes, in particular, settlements.

At the end of 2013, the Carpathian Biosphere Reserve prepared and submitted a periodic review (report) on the activity of the Biosphere Reserve over a 10-year period. Based on the expert revision of the report, the International Coordination Council of the UNESCO Program Man and Biosphere (MAB), in June 2014, adopted a Decision on CBR, in particular, and concluded that this protected area did not fully meet the criteria set out in the Statutory

Frameworks for the World Network of Biosphere Reserves. The nonconformity with the above-mentioned criteria consisted in an insufficient size of the transition zone, which was caused by the cluster pattern of the territorial structure, as well as significant fragmentation of the territory and its low ecological integrity and connectivity.

In order to fulfill the given decision, in spring of 2016, the reserve's administration began intensive work on formation of the transition area of CBR. As a matter of priority, there was reached an understanding with the Zakarpattia Regional Department for Forestry and Hunting as for the establishment of a transition zone for the Carpathian Biosphere Reserve (CBD) in the territories of individual state forestry enterprises in order to ensure sustainable forest management in the region. The creation of a transition (or sustainable development area) is documented by a

special memorandum on cooperation prepared and signed by the managers of both institutions on April 14, 2016.

According to the aforementioned memorandum, CBR's transition zone is formed out of the state forestry enterprises located directly within the area of the Carpathian Biosphere Reserve's activity in Rakhiv and Tiachiv administrative districts of Zakarpattia Region, namely, the Rakhiv State Experimental Forestry Enterprise (the whole area), the Yasinia State Forestry and Hunting Enterprise (Svydovets and Lopushanske forestry districts), the Velykyi Bychkiv State Forestry Enterprise (except for Verkhnie Vodiane forestry district), the Brusturiany State Forestry and Hunting Enterprise (Hrunykyvske forestry district) and the Mokrianske State Forestry and Hunting Enterprise (Tykhovetske, Krasnianske, Ust-Chorna and Tarasivka forestry districts). Land plots of the state forestry enterprises



Spruce monoculture in the  
Chornohora protected massif

are included in the transition zone for the purpose of introducing the ideas of sustainable socio-economic development, in particular – sustainable use of forest resources, increasing their recreational attractiveness and in order to deepen cooperation in the field of valuable natural complexes protection. All of them, without exception, are certified under the international FSC scheme and meet all its criteria and principles.

The memorandum also states that CBR's administration and the state forestry enterprises, as well as local communities located within the area of activity of the institution and in the vicinity, cooperate in the sphere of natural and cultural complexes and objects protection, and the socio-economic development of the Carpathian region. Priority areas for cooperation are: implementation of the concept of sustainable use of forest resources, development of infrastructure, fostering recreational and tourism activities, reduction of environmental impact caused by the economic activity, preparation of plans and programs for socio-economic development and implementation of relevant demonstrative projects, search for funding and provision of appropriate resources, eco-education, training and

further capacity building programs, public awareness and participatory management, joint events and activities, etc.

In addition to the aforementioned memorandum, CBR's administration has recently signed the declarations on cooperation between the Carpathian Biosphere Reserve and a number of town and village councils to include them into the transition zone (or sustainable development area) of CBR. As of September 31, 2018, such declarations were signed with the territorial communities of the settlements of Bohdan, Luhy, Vydrychka, Roztoky, Yasinia, Kvasy, Dilove, Kosivska Poliana, Luhy, Chorna Tysa and Kostylyvka of Rakhiv district, and Uhlia, Shyrokyi Luh and Velyka Uholka of Tiachiv district.

The above-mentioned state forestry enterprises and territorial communities make up the transition zone with a total area of 124.300 hectares. Thus, the overall territory of the reformed CBR (as a MAB UNESCO reserve) is 181138.8 ha. The newly created reserve of the international level is a non-fragmented, holistic site with high ecological connectivity and integrity, providing, in particular, living conditions to viable populations of large carnivorous mammals: bear, wolf and lynx.

It is important to note that the newly created territory of the transition zone covers a large part of the ecological network of Zakarpattia region, including all major latitudinal and meridional ecological corridors, which connect those cluster sections of the biosphere reserve that have the national conservation status. All of these clusters have classic zonation, that is, include protected areas delimited with buffer zones from the transition zone.

In March 2017, the UNESCO MAB Advisory Committee, following the review of the materials submitted by the Biosphere Reserve, confirmed the full compliance of its new zonation pattern and territorial structure with the criteria of the Statutory Frameworks for the World Biosphere Reserves Network. Thus, the administration of the CBO was able to solve one of the most painful and important problems in a timely manner, thus maintaining the status of an institution of international importance as a UNESCO MAB Biosphere Reserve. After all, according to the Law of Ukraine "On the Protected Areas System of Ukraine", the biosphere reserves acquire international status only if they are included into the UNESCO World Network of Biosphere Reserves under the Man and Biosphere Program.

In the context of the BR, it is important to note that the staff of the department actively participated in preparation of the Lima Action Plan for UNESCO Biosphere Reserves and other important nature conservation documents at the national and international levels.

For the map of CBR territory with the newly created transition zone see p. 4.

In the transition zone (territory of sustainable development) of the Carpathian Biosphere Reserve there are 17 village and town councils, which include 33 settlements, in particular the Rakhiv district center. Basic information on territorial communities in CBR's transition zone is provided in Table. 1.

In the transition zone of CBR, as of December 31, 2017, there lived 71.705 people, including 15.137 inhabitants of the district center. Ethnic composition is dominated by Ukrainians, followed by Hungarians, Gypsies, Romanians, Russians, etc.



**Director of the Carpathian Biosphere Reserve Mykola RYBAK (left) and Director of the Duna-Ipoly National Park, Hungary, Andras FURY (right) signed the Memorandum of Understanding and Cooperation between the institutions (Budapest, June 15, 2016)**



Table 1

## COMMUNITIES WITHIN THE TRANSIT ZONE OF CBR AS A MAB-UNESCO RESERVE

№	Name	Central community	Towns/villages	Area, ha	Population, People	Total number of inhabitants
1	Rakhiv Town Council	Rakhiv town	Rakhiv	568	15137	15137
2	Roztoky Village Council	Roztoky Village	Roztoky	205	2803	2803
3	Vydrychka Village Council	Vydrychka Village	Vydrychka	1150	2322	2322
4	Luhy Village Council	Luhy Village	Luhy	145	1008	1388
			Hoverla	80	380	
5	Kvasy Village Council	Kvasy Village	Kvasy	647	1794	2313
			Sitnyi	32	142	
			Trostianets	240	377	
6	Bohdan Village Council	Bohdan Village	Bohdan	1290	3364	4074
			Breboia	540	710	
7	Bilyn Village Council	Bilyn Village	Bilyn	400	1746	1746
8	Lazeshchyna Village Council	Lazeshchyna Village	Lazeshchyna	1078	4174	4174
9	Yasinia Village Council	Yasinia Village	Yasinia	146	7501	8308
			Stebnyi	97	807	
			Vilkhovatyi	79	1365	
10	Luh Village Council	Luh Village	Luh	375	1985	1985
11	Dilove Village Council	Dilove Village	Dilove	860	3505	3505
			Kruhlyi			
			Khmeliv			
12	Kosivska Poliana Village Council	Kosivska Poliana Village	Kosivska Poliana	1129	4222	4222
13	Kostylivka Village Council	Kostylivka Village	Kostylivka	685	4049	5414
14	Chorna Tysa Village Council	Chorna Tysa Village	Chorna Tysa	1618	2746	2746
15	Uhlia Village Council	Uhlia Village	Uhlia	241	3117	6234
			Bobova		198	
			Hrunyky		1416	
			Mala Uholka		1503	
16	Velyka Uholka Village Council	Velyka Uholka Village	Velyka Uholka	180	2052	2052
17	Shyrokyi Luh Village Council	Shyrokyi Luh Village	Shyrokyi Luh	721	1964	3282
			Pryhid		663	
			Fontyniasy		655	
			Zarichne		384	
			Kireshti		1404	
			Chertizh		1517	
<b>TOTAL NUMBER OF INHABITANTS</b>						<b>71705</b>



Members of the Ukrainian delegation: Yuriy Berkela, Vira and Vasyl Pokynchereda, Mykola Rybak (second, third, fourth and fifth on the left) among the participants of the International Conference on occasion of the 25<sup>th</sup> Anniversary of Rhön Biosphere Reserve (Germany, June 10 2016)

## IMPLEMENTATION OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Taking into account that the main objectives of UNESCO biosphere reserves are the implementation of the principles of sustainable development, it is necessary to mention that in the scope of CBR there are 40 settlements, where about 100 thousand people live. Consequently, the proper preservation of the reserve's natural ecosystems is impossible without establishing a systematic work in the context of improving cooperation between the administration of the protected area and the territorial communities regarding sustainable development of the adjacent territories and the traditional nature management practiced by the local population within the reserve, where it is allowed by the current legislation. We mean the buffer zone and the zone of anthropogenic landscapes.

As you know, the main and most effective advisory body of MAB biosphere reserves is the Coordination Council, which is set up in order to effectively manage the reserve and includes representatives of all key stakeholders in the area. Such a Council is also established for the Carpathian Biosphere Reserve. It includes the representatives of territorial communities, local governments, executive authorities, heads of state forestry enterprises, tourism businesses, team members of the Carpathian Biosphere Reserve, etc. The operation of the Coordination

Council is entrusted to this department – its unchanging secretary is Deputy Head of the Department, Ing. Vasyl Pokynchereda.

In April 2013, at the first meeting of the Coordinating Council, a Memorandum on cooperation in the sphere preservation and sustainable use of the natural complexes of CBR within the Rakhiv district as part of the UNESCO World Heritage Property "Primeval beech forests of the Carpathians and the ancient beech forests of Germany" was signed between the Administration of the Reserve and the Head of the District State Administration, the District Council and local communities. In total, it was signed by 24 authorized individuals. The aim of the cooperation was to ensure the implementation of the Decree of the President of Ukraine "On the expansion of the territory of the Carpathian Biosphere Reserve" dated on January 14, 2010, No. 25, and to pool together efforts on preservation and sustainable use of CBR's natural complexes on the basis of the systematic regulation of the environmental, economic, social and other public interests of the territorial communities within Rakhiv district. In 2012, an identical memorandum is concluded for Tiachiv district as well.

Taking into account the necessity to work together in order to protect the valuable natural complexes of the Reserve and ensure sustainable development and improvement of the surrounding settlements, the issue of deepening cooperation between CBR and the local communities by concluding special agreements aimed at achieving this objective has become really crucial.

The follow-up meetings of the CBR Coordinating Council were important steps in establishing such cooperation with the communities, they took place on October 20, 2016, also on May 24, and November 23, 2017. They unanimously approved the work conducted by the administration of the Carpathian Biosphere Reserve and a clear signal from the majority of the territorial communities was received as for the readiness to strengthen this mutually beneficial cooperation.

The Coordinating Council has developed a number of proposals and recommendations to the Administration of the Reserve, in particular, regarding the expansion of the reserve's area by adding primeval beech forests of Tiachiv district, sustainable development of territorial communities, as well as on settling the issues of joint recreation and environmental education activities, and streamlining of the general and special use of natural resources to meet vital needs of citizens.

By developing cooperation with territorial communities and relying on local Councils' requests, the CBR Administration in 2016 and in early 2017 entered into agreements with individual territorial communities on cooperation in the field of improving the traditional mountain farming, preservation of the highland "polonyna" culture and sustainable use of natural complexes. Today they are signed by the mayors of such settlements as Dilove, Luh, Kostylivka, Kosivska Poliana and Lazeshchyna in Rakhiv district. Seven communities more are now considering signing these agreements.

In order to provide the vital needs in timber through sanitation and other types of fellings, the local population living in the area of CBR location, are annually provided by the administration of the reserve with about 7000 cubic meters of fuelwood and construction timber. For keeping order in fuel wood distribution among local population and highland farms, given that wood prices in



the reserve compared to the neighboring state forestry enterprises are much lower, the reserve prepares lists of the people who are to be provided with firewood, and then these lists are agreed by the mayors of respective settlements.

The administration of CBR is convinced that constructive cooperation with local communities and business entities on sustainable development of the adjacent territories and the provision of traditional nature management will, on the one hand, ensure the proper level of preservation of the UNESCO World Heritage Property "Primeval beech forests of the Carpathians and the ancient beech forest of Germany", and, on the other hand, will promote socio-economic development of these territories and increase the well-being of the local population.

## UNESCO WORLD HERITAGE PROPERTY

One of the important directions of the department's work is to ensure functioning of the UNESCO World Heritage Property. The team of the department took the most active part in preparation of the nomination dossier, based on which in 2007 primeval beech forests of CBR became part of UNESCO World Heritage Property "Primeval beech forests of the Carpathians". In particular, they prepared descriptions of the nominated clusters, carried out a general editing of the text, prepared all the necessary maps.

Its team provided strong assistance to our German partners during the preparation of the nomination dossier for expanding the World Heritage Property by successfully adding 5 clusters of oldgrowth beech forests of Germany in 2011.

Due to the designation of the UNESCO WH Property "Primeval beech forests of the Carpathians and the ancient beech forests of Germany" in 2011, the UNESCO World Heritage Committee adopted a number of recommendations with the instructions for the governments of Ukraine, Slovakia and Germany to finalize the formation of the given Property by including into its composition the most valuable clusters of beech primeval and oldgrowth forests from the whole continent of Europe. Following these instructions, the government of Germany launched an international project "Beech forests – common natural heritage of Europe", which had been implemented during the period from 2012 till 2014. The aim of the project was to ensure support for the pan-European process of the Property extension by adding the most valuable primeval and oldgrowth beech forest sites from those biogeographic regions of Europe, which had not yet been represented in it. The first workshop within this project took place on October 3-4, 2012 on the island of Vilm at the International Academy of Nature Conservation of the Federal Ministry for environment, nature conservation, building and nuclear safety of Germany. The results of comparative analysis of different primeval and oldgrowth beech forest sites of Europe were discussed and finalized at the workshop according to their potential

regarding the expansion of the Property. Apart from that, with joint efforts, the experts prepared a draft wording of the justification of the Outstanding Universal Value of the pan-European nomination and proposed geographic boundaries for the possible extension of the Property. In particular, the workshop participants agreed the distribution pattern of beech range within 12 beech forest regions (BFR), 4 of which are found in Ukraine too: the Carpathian, Polonian-Podillia-Moldovian, Pannonic and Euxinic.

The next important stage of the project implementation was the expert seminar held on September 18-21, 2013 in the town of Rakhiv at the Carpathian Biosphere Reserve. The selection criteria for the most valuable primeval and oldgrowth beech forest sites were agreed there, and their list (so-called Rakhiv list) was drawn up. The list, among others, included also additional Ukrainian clusters. Also, the experts agreed on the roadmap for the nomination dossier preparation. One of the co-authors of this article – deputy manager of the Department for scientific research and international cooperation – presented beech primeval and oldgrowth forest sites from the two BFRs of Europe – Polonian-Podillia-Moldovian and Euxinic – which had been selected in a cameralistic manner.

In 2014, on April 3-4 another seminar took place in Vienna (Austria), attended by the experts from 23 countries of Europe, as well as authorized representatives of the UNESCO World Heritage Committee and the International Union for Conservation of Nature (IUCN). The key objectives of the workshop were to agree on the



Participants of the international meeting on summarizing the expansion of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" (Hainburg an der Donau, Austria, October 2017)

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



**Dr. Ihor IVANENKO,**  
*Head of the State Agency  
for Protected Areas  
of Ukraine (2005-2007),  
Director of the Nature  
Conservation Department  
of the Ministry for  
Environmental Protection  
of Ukraine (2014-2017),  
nowadays – Deputy Director  
of the Department of  
Economics and Environmental  
Management of the State  
Ecological Academy  
of Postgraduate Education  
and Management, Kyiv*

1. CBR takes the leading position in the global environmental protection process. It plays an important role in the UNESCO Convention on World Heritage Protection, as well as in the Man and Biosphere Program.

2. Development of the reserve's infrastructure, which is not available in any other protected area: well-equipped offices of field divisions, functional museums, eco-education centers, an apartment building constructed for scientific staff, a number of offices. A clear system of protection and restoration of CBR's biodiversity has been set up, a great number of international cooperative contacts have been established, UNESCO World Heritage Property has been designated and its conservation is fully secured.

3. International Capacity Building and Research Center for primeval beech forests and sustainable development, which is to be created at CBR.

4. The Carpathian nature preservation is one of the noble missions, which is appreciated not only by present but also by future generations. Disadvantages: current mentality and experience of the local population do not allow to fully assess the importance of the work conducted by CBR. Therefore, the target group of ecoeducation activity is not only CBR's guests but also for the local population.

5. The system of capacity building for the employees of protected areas network of Ukraine at the State Ecological Academy of Postgraduate Education and Management was initiated. In the future, all employees of the protected areas network of Ukraine should be involved in this training.

6. Field trip of the German delegation dedicated to the management of UNESCO World Heritage Properties held on May 9, 1999.



selection procedure of the candidate sites that would be used for the expansion of the already existing Property, and identify their additional Outstanding Universal Value. Also, in its framework, the so-called Vienna list of candidate sites was drawn up, which, unlike the Rakhiv list, already included five Ukrainian clusters from the territories of the national nature parks "Synevyr", "Enchanted Land" (Zacharovanyi Krai), "Podilski Tovtry" and nature reserves "Gorgany" and "Roztochchia".

In autumn that year, in Bonn (Germany), a working meeting was held on the international project dedicated to the discussion of the roadmap for preparation of the Pan-European nomination dossier for expansion of the Property and the procedure of including the candidate sites to the tentative list, which is a necessary precondition for their further nomination. The Ukrainian delegation officially agreed to include in the all 5 preliminary selected components from the territory of Ukraine.

According to the agreements reached at the Bonn meeting, CBR scientists initiated and conducted a workshop for preparation of application forms for the Ukrainian components (November 18, 2014, Rakhiv). The result of the workshop was listing all 5 clusters of primeval and oldgrowth beech forests into the aforementioned list.

In order to complete the works on nomination of the potential plots at the national level, the scientists of CBR, together with the representatives of the interested institutions of the Protected Areas System of Ukraine, have been carrying out extensive work on field assessment of these sites during 2015 in order to establish their conformity with the selection criteria approved within the international project. Also, during the field phase, much work has been carried out to determine the area and configuration of each of the sites. Thus they formed the basis for the preparation of relevant maps using the GIS software and hardware of CBR. In parallel, the collection of information on the key abiotic and biotic characteristics of the nominated component parts was essential, because it was necessary for the preparation of nomination dossiers.

According to the results of field research, another workshop was organized at CBR on July 31, 2015 which became an important step towards the successful completion of the nomination process for the candidate component parts from Ukraine, and it provided all the

indispensable preconditions for the preparation of the nomination dossiers, graphic maps and other annexed documents. According to its results, a dossier of documents are prepared for five components of beech primeval and old-growth forests, three of which are in the Carpathian region (NNPs Synevyr and Enchanted Land,, Gorgany NR), the rest are on the Podillia highlands (NP Podilski Tovtry and Roztochchia NR).

On July 7 and September 21-22, 2015, two important working meetings were held in Vienna, organized by the Federal Agency for Nature Protection of Austria. Both were dedicated to completing the preparation of a joint dossier for the UNESCO WH Property extension. The first workshop dealt mainly with the national nomination dossiers, while the second one focused on discussing the common part the joint nomination dossier, including the proposed management system. It was there that a concerted decision was made that the extended Property would be called "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe".

During November 2015, the joint nomination dossier passed the pre-check. Within its framework, European experts have thoroughly analyzed the above-mentioned document and made a number of comments on its contents. During the first half of December, the Ukrainian side submitted the necessary editorial files and handed over this document to the Austrian partners who acted as coordinators of the pan-European nomination process. In early 2016, the reviewed nomination dossier was officially signed by the ambassadors of UNESCO member countries at a meeting in Paris. After being signed, on 28 January, it was submitted to the UNESCO World Heritage Committee and to IUCN. On March 1, 2016, the results of the dossier verification confirming its full compliance with the standards were released. This event was preceded by the submission of official letters of support from Ukraine, Slovakia and Germany to the World Heritage Committee in support of the pan-European nomination.

During the first half of 2016, active preparation for the visit of the IUCN expert, who was supposed carry out a field evaluation of the nominated territories, was held in Ukraine. Expert Kumiko Yoneda from Japan had been working in Ukraine from October 1 to October 5. Her program included an excursion to each of the nominated sites, as well as meetings

with local stakeholders and protected areas managers, local governments and self-government bodies, territorial communities, NGOs, businesses and more. The overwhelming majority spoke in favor of granting World Heritage status to the nominated territories, noting that such status would contribute not only to their preservation but also to the improvement of Ukraine's international image. During the expert visit, all the necessary information was collected, which, in turn, made it possible to draw objective conclusions about the compliance of the nominated sites with the UNESCO World Heritage criteria.

Despite individual comments from IUCN on the pan-European nomination dossier, on July 7, 2017, at the 41<sup>st</sup> Session of the UNESCO World Heritage Committee (July 6-8, 2017, Krakow, Poland), a historic decision was made to significantly expand the Ukrainian-Slovak-German UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany" and its renaming into "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe". The extension involved 63 sites of primeval and oldgrowth beech forests from 10 European countries, namely: Albania, Austria, Belgium, Bulgaria, Croatia, Italy, Romania, Slovenia, Spain and Ukraine, with a total area of 58407.04 ha, and was recognized by the Committee as a globally-important

natural heritage site, as it represented the evidence of an exceptional evolution of the *Fagus sylvatica* species and the expansion and importance of beech ecosystems in Europe since the last ice age. In this list Ukraine is represented by 9 component parts, which are protected in the national nature parks "Synevyr", "Enchanted Land" and "Podilski Tovtry" and nature reserves "Gorgany" and "Roztochchia". It is important that scientists of the Carpathian Biosphere Reserve, under the guidance of the coordinator of this process in Ukraine Vasyl Pokynchereda, provided the preparation of nomination materials for the above-mentioned protected areas of Ukraine. Obtaining the status of the UNESCO World Heritage Property by the Ukrainian protected areas has become a significant event for both protected areas taken individually and for Ukraine as a whole. It was preceded by years of hard work done by the scientists from the aforementioned national parks and reserves, coordinated and supported by the Carpathian Biosphere Reserve and the Danube-Carpathian Program of WWF.

Thus, the newly-created transnational UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" includes 78 component parts of beech primeval and ancient forests from 12 European countries that occupy the area of 92023,24 hectares, and their buffer zone is 253815,69 hectares. In Ukraine, in total, there are 15 components with a



**During an expert field mission to the primeval beech forests of the Enchanted Land National Park. IUCN expert Kumiko YONEDA – the third in the front row. The last one on the right – coordinator of the World Natural Heritage Property expansion process in Ukraine – Vasyl POKYNCHEREDA**



## The town of Rakhiv – the administrative center of the Carpathian Biosphere Reserve

total area of 26453,98 hectares, which is 28.75% of the total area of this pan-European property. The buffer zone of Ukrainian component parts amounts to 44126.65 hectares.

An important follow-up to the above-mentioned event was the international gathering dedicated to the outcomes of the 41<sup>st</sup> meeting of the UNESCO World Heritage Committee, where the Property "Ancient and Primeval Beech Forests of the Carpathians and other Regions of Europe" had been listed into the UNESCO WH List. The meeting was organized by the Federal Ministry of Agriculture and Forestry, Environmental Protection and Water Resources Management of Austria, which took place from 3 to 5 October 2017 in Hainburg an der Donau (Austria). Ukraine was represented here by Director of the Department for Protected Areas and Ecological Network of the Ministry of Natural Resources of Ukraine Victor Klid, Ecological Projects Coordinator of the World Fund for Nature (WWF) in Ukraine Bohdan Prots and scientists of the Carpathian Biosphere Reserve – Yuriy Berkela and Vasyl Pokynchereda. In total, the event was attended by more than 30 experts from 11 European countries – representatives of ministries and agencies, administrations of protected areas, scientific institutions and higher educational establishments, non-governmental organizations. The aim of the meeting was to consider issues related to the follow-up to the decision of the UNESCO World Heritage Committee on the expansion of the trilateral Property and designation of a new UNESCO World Heritage Property based on it –

"Ancient and Primeval Beech Forests of the Carpathians and other Regions of Europe". In particular, the parties discussed their liabilities, the wording of the Joint Declaration of Intent, the implementation of the Integrated Management System, the format of the next Joint Management Committee meeting, ways to implement the recommendations made by the UNESCO World Heritage Committee, the problem of changing and clarifying the boundaries of the component parts, financial and coordination issues of next Property extension. Representatives of the Carpathian Biosphere Reserve Yuriy Berkela and Vasyl Pokynchereda presented information about the outcomes of the meeting of the Joint Management Committee for the Ukrainian-Slovak-German UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and Ancient Beech Forests of Germany" held in September 2017, and took part in the discussion.

In the context of the Convention for the Protection of the World Cultural and Natural Heritage (Paris, 1972), the Carpathian Biosphere Reserve ensured the organization of and held the last meeting of the Joint Management Committee of the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and Ancient Beech Forests of Germany" on September 27, 2017 in Rakhiv in the framework of an international scientific conference dedicated to the 10<sup>th</sup> anniversary since enlisting the primeval beech forests of Ukraine and Slovakia to the UNESCO World Heritage List. The Joint Management Committee is composed of representatives of the Ministries of Environment of the member countries, relevant protected areas and experts. In total, about twenty people attended the meeting, 6 items of the agenda were considered. Based on the results, a corresponding protocol was prepared.

According to the assignment given by the Department for Ecological Network and Protected Area System of the Ministry of Natural Resources of Ukraine, the staff of the department also elaborated materials on the problems of conservation of the UNESCO World Heritage component part "Stuzhytsia-Uzhok", located on the territory of Uzhanskyi National Nature Park. Also a number of proposals were developed to optimize the configuration of the UNESCO World Heritage component part "Satanivska Dacha" located in the territory of the Podilski Tovtry National Nature Park. The results of the work on both assignments were reported about during the working group meetings of the Natural Sciences and Natural World Heritage Section of the National Commission of Ukraine for UNESCO.

On April 26-28, 2018, at the Paklenica and Northern Velebit National Parks (Croatia), the first meeting of the Joint Steering Committee of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" took place. More than 40 people from 11 European countries took part in it. Those were the representatives of ministries and agencies, administrations of protected areas, scientific institutions and non-governmental organizations. Among the participants there were 2 representatives of CBR – team members of the Department for scientific research and international cooperation.

Manager of the Department Yuriy Berkela and his deputy Vasyl Pokynchereda are members of the national steering group – the Ukrainian part of the Joint Steering Committee of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe", and Vasyl Pokynchereda is the secretary of this group.

## EXPANSION OF CBR'S TERRITORY

The staff of the department were active participants of every stage of CBR's territory expansion, starting from 1991. Due to their contribution the area of the reserve has increased from 18 000 hectares to more than 58 000 hectares, which allowed to protect large areas of natural ecosystems with their rich biodiversity with a significant share of rare species. They, in particular, participated in the survey of territories for expansion, prepared scientific justification and corresponding graphic maps. Now the department is the leader of the next extension of the territory of the reserve, which is being implemented in Zakarpattia within Tiachiv district. In the framework of this expansion, the area of the reserve should be enlarged by more than 9 000 hectares, which mainly will be made up of the unique primeval beech forests. The territory, on which the expansion of the Carpathian Biosphere Reserve (CBR) is planned by adding the adjacent areas of primeval beech forests, is located directly on the border of the Uholka-Shyrokyi Luh protected massif, within the mountain range of Krasna, part of the main watershed ridge of the Ukrainian Carpathians, involving some nearby areas that belong to the zone of Maramures cliffs.

For the purpose of the camera detection of potential primeval and oldgrowth beech forest sites, the employees of the department studied the materials of forestry management of the state forestry enterprises "Mokrianske" for 5 forestry units (Tarasivske, Krasnianske, Ust-Chornianske, Ruska-Mokra and Komsomolske) and the Brusturianske SFE (Grundykivske forestry unit) for the period from 1948 to 2012. The materials of the Czechoslovak era have not been taken into account since it is well-known that during that period the forests that were located in remote areas far from settlements were not of any economic significance and did not fall under any forest management measures.

The department also worked on the data obtained in the framework of several large-scale international projects. First of all it was the Ukrainian-Dutch project "Primeval forests of Transcarpathia (Ukraine) as core-areas of pan-European ecological network", which was being implemented during 2005-2007 by the Carpathian Biosphere

Table 2

### POTENTIAL PRIMEVAL AND OLDGROWTH FORESTS OF MOKRIANSKE SFE

Forestry district	Compartment/sub-compartment	Area, ha
<b>Krasnianske</b>	Cmp. 1/ 1-11, 13, 21-23	100
	Cmp. 2/ 1-7, 15, 16	64
	Cmp. 3/ 1-5, 17, 12, 14	81
	Cmp. 5/ 1, 4-8	59,5
	Cmp. 6/ 1-3, 6, 10	79,2
	Cmp. 7/ 1-12, 15, 16, 19, 20	150,8
	Cmp. 11/ 1-7, 8, 9	54
	Cmp. 12/ 1-9, 13	57,3
	Cmp. 13/ 1-11, 13, 19	76,7
	Cmp. 19/ 1, 2, 3, 5	30,6
	<b>TOTAL for the forestry district</b>	<b>753,1</b>
<b>Komsomolske</b>	Cmp. 23/ 31-35, 40-42	46,8
	Cmp. 24/ 18, 19, 22	63,9
	Cmp. 25/ 17-24	49
	Cmp. 26/ 48, 51-56	65,2
	Cmp. 27/ 4, 16, 22, 27-29, 34-36	71,3
	Cmp. 28/ 1-15, 27-29, 35, 37-39,43	141,3
	Cmp. 29/ 7-10, 15-27	172,2
	Cmp. 30/ 1-7, 41, 44-46	93
	Cmp. 31	120
	Cmp. 32/ 7-14, 17-21	90,5
	<b>TOTAL for the forestry district</b>	<b>913,0</b>
<b>Ust-Chorna</b>	Cmp. 1	191
	Cmp. 2	165
	Cmp. 3	200
	Cmp. 4	137
	Cmp. 5	168
	Cmp. 6	121
	Cmp. 7/ 36, 37, 42, 43	23,6
	Cmp. 8/ 9, 10, 21-22	25,2
	Cmp. 19/ 1, 2, 4-7	61,3
	Cmp. 20/ 1, 2, 4, 10, 12	29,4
	Cmp. 21/ 1-7, 46, 47	45
<b>TOTAL for the forestry district</b>	<b>1167,0</b>	
<b>Ruska Morka</b>	Cmp. 32/ 40-50	68,8
	Cmp. 33/ 9, 11-22, 26-29	61
	Cmp. 31/ 14-16, 8-16	96,9
	Cmp. 34/ 15-36	126
	Cmp. 35	104
	Cmp. 36/ 7-12, 14, 33, 20-26, 30-33	136,8
<b>TOTAL for the forestry district</b>	<b>593,5</b>	
<b>Tarasivske</b>	Cmp. 1	126
	Cmp. 2	97
	Cmp. 3	165
	Cmp. 4	105
	Cmp. 5	146
	Cmp. 6/ 1-19, 31-37	79,8
	Cmp. 7/ 1-27, 33, 35	140,7
	Cmp. 8/ 1-25, 30-32	143
	Cmp. 9	138
	Cmp. 10/ 1, 8, 10, 11, 12, 14, 23,	57,4
	Cmp. 11/ 1-20	55,4
	Cmp. 12/ 1-8	93,6
	Cmp. 13	115
	Cmp. 14/ 15,18, 20, 21, 22, 28	40,9
	<b>TOTAL for the forestry district</b>	<b>1461,9</b>
<b>TOTAL</b>	<b>4888,0</b>	

Reserve in cooperation with the Royal Dutch Society for the Conservation of Nature (KNNV) and funded by the BBI-MATRA Foundation of the Ministry of Agriculture, Nature and Product Quality and the Ministry of Foreign Affairs of the Netherlands, as well as a number of other projects on primeval and oldgrowth forests identification (implemented in the Ukrainian Carpathians from 2012 to 2017 under the auspices of WWF-DCP).

The results of the analysis of the above-mentioned archival materials in the context of forestry units are presented in Table 2 (see page 19), which contains a list of compartments / sub-compartments, where potential primeval and oldgrowth beech forests are presented.

Thus, according to the results of the analysis of archival data, potential primeval and oldgrowth forests were identified on the area of 4888 hectares.

In addition, the department conducted the work on the determination of primeval beech forests on the territory adjacent to the current boundaries of CBR, which could serve as a resource to meet the needs of the local population in fuelwood. As it has been mentioned above, the Uholka and Shyrokyi Luh field divisions of CBR are located here, which are almost entirely belong to the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and other Regions of Europe", where any human

management is prohibited. At the same time, the areas adjacent to these field divisions of the Reserve do not have a direct gas supply, so firewood is the only source of heating here. All this leads to a permanent conflict of interest between the local communities and the biosphere reserve. Inclusion of managed forests into its territory would help to ease this tension in relations with the local population, and would contribute to the preservation of the existing primeval and oldgrowth forests. The total area of the managed forests, which potentially can be included into CBR, is about 3.800 hectares.

## PRIMEVAL AND OLDGROWTH FORESTS IDENTIFICATION IN COOPERATION WITH WWF DCP

Preservation of primeval and oldgrowth forests and is one of the key tasks of the Carpathian Biosphere Reserve, which, in its turn, involves their identification both at the office level and in field. Employees of the department were engaged in the primeval and oldgrowth forests identification process within the framework of several large-scale international projects.

As a result of implementation of the Ukrainian-Dutch project "Virgin forests of Transcarpathia (Ukraine) as the core areas of the pan-European ecological network", forest management materials for the forests with a total area of 526 thousand hectares were processed. Of these, 251,358 hectares of forest stands within the Rakhiv and Tiachiv districts were studied during field missions, among which virgin forests were identified on the area of 38,672.3 hectares. In addition, 22517 hectares of potential virgin forests were identified within the forest stands of other districts of the Transcarpathian region as a result of in-office studies. For the virgin forests identified in Transcarpathia, a geo-information database (GDB) created in the ESRI ArcGIS 9 software environment has been developed. The structure of the GDB includes 2 target classes of attributes and 15 digital charts. Using the above-mentioned GDB, maps of virgin forest sites location, 6 in total, as well as maps of the Transcarpathian forests and virgin forests according to the types of forest stands.

The department's employees participated in a number of projects (the ones described above) on primeval and oldgrowth forests identification, which had been implemented in the Ukrainian Carpathians from 2012 till 2017 under the auspices of WWF-DCP. In particular, they carried out works on the identification of the most valuable forest sites according to WWF methodology for the three field divisions of CBR, namely Maramures, Trybushany and Rakhiv-Berlybash, having processed the materials of forest management with a total area of more than 10 000 hectares. In general, especially valuable forest sites are found on the area of 5 000 hectares.

In the framework of another WWF-DCP project, the identification of primeval and oldgrowth forests in the territory of the Volovets State Forestry Enterprise was held: Nyzhniy Volovets forestry district (5362.4 ha) and Verkhniy Volovets forestry district (5146.1 ha); Khust State Forestry Enterprise: Vyshkovo forestry district (4586.6 ha) and Veliatyn forestry district (3269.8 ha); Velykyi Bychkiv State Forestry Enterprise: Kosivska Poliana forestry district (6478.2 hectares), forestry district named after Ing. Tomashchuk (5062.9 ha), Serednia Rika forestry district (5745.1 ha) and Shcherbyliv forestry district (6231 ha); Yasinia State Forestry Enterprise: Lazeshchyna



Students of the Eberswalde University for Sustainable Development (Germany) during the hiking tour to the Uholka-Shyrokyi Luh protected massif of CBR, May 2017



## Karst Arch in the primeval forests of Uholka

forestry district (6842 ha) and Rakhiv State Forestry Enterprise: Rakhiv forestry district (2922 ha), Bohdan forestry district (5526 ha), Kvasy forestry district (6282 ha) and Hoverla forestry district (5090 ha). The results of the works are as follows: In the context of the abovementioned state forestry enterprises, the oldgrowth and primeval forests are identified in the following areas: Volovets SFE – 3046.1 ha, Khust SFE – 250.1, Velyki Bychkiv SFE – 2117.7 ha, Yasinia SFE – 291 hectares, Rakhiv SFE – 3183 hectares.

In the context of the topic of primeval and oldgrowth forests, it is important to note that the department participated in a number of legislative initiatives, in particular, took an active part in the development of the recently adopted Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on the protection of primeval forests under the Framework Convention on Protection and Sustainable Development of the Carpathians", as well as other important environmental documents of the national and international levels. The topic of primeval forests continues to be key issue for the department.

## TRANSBOUNDARY COOPERATION

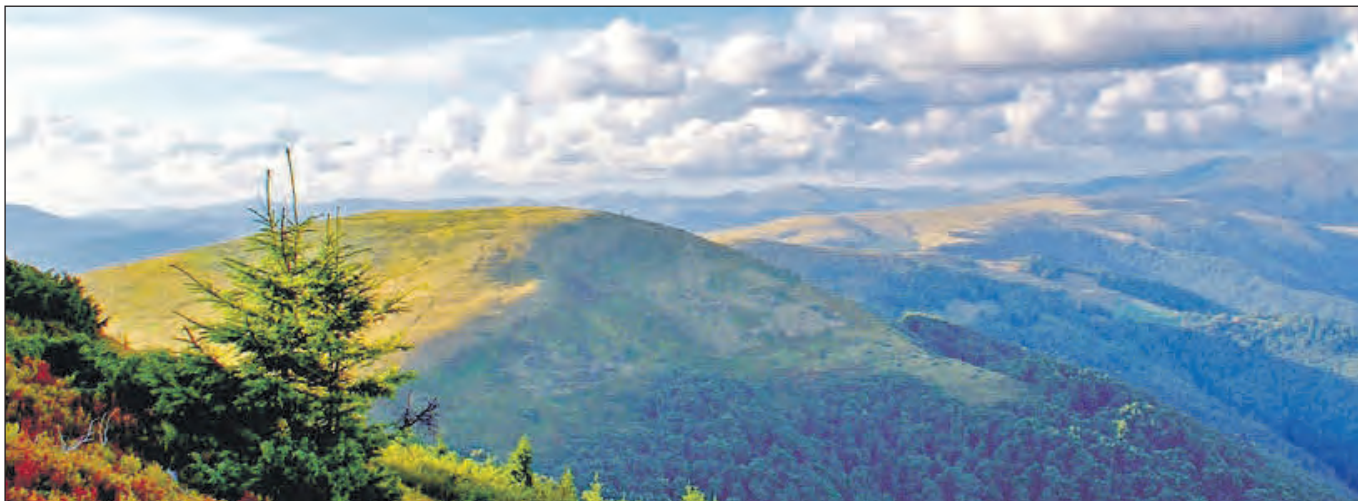
One of the main fields of work of the institution is cross-border cooperation, which in particular involves the creation of a transboundary Ukrainian-Romanian biosphere reserve "Maramures Mountains" on the basis of the Carpathian Biosphere

Reserve (Ukraine) and the nature park "Maramures Mountains" (Romania). Its organization is foreseen by the "Strategy for the implementation of the Framework Convention on the protection and sustainable development of the Carpathians", approved by the Cabinet of Ministers of Ukraine by its Decree No. 11-r on January 16, 2007.

In this context, it is important that from 2011 to 2014, the Carpathian Biosphere Reserve together with the nature park "Maramures Mountains" participated in the implementation of the large-scale international project "BIOREGIO-Carpathians": Integrated Management of Biological and Landscape Diversity for Sustainable regional development and ecological connectivity in the Carpathians". This project aimed to create the necessary prerequisites for Ukrainian and Romanian partners to organize a transboundary biosphere reserve in the Maramures Mountain Massif. During this period a number of workshops were held with the participation of Romanian partners. Their main result was the signing of a series of memorandums of understanding between the Carpathian Biosphere Reserve (Ukraine) and the nature park "Maramures Mountains" (Romania) on the establishment of the Ukrainian-Romanian transboundary biosphere reserve in the Maramures Mountains. The last one was signed in 2014 by the managers of both institutions – Mr. Mykola Rybak and Mrs. Catalina Bogdan. During numerous meetings the Romanian colleagues have repeatedly informed the Ukrainian side

on the state of preparation activities aimed at submitting the application form for obtaining the status of a MAB biosphere reserve, completion of which would be the beginning of joint work on obtaining the status of a transboundary biosphere reserve (TBR). Despite the completion of the preparation process for the application form, the administration of the nature park has not yet received an approval from the local communities for the creation of a MAB BR. Today, this work is still ongoing. Taking into account this situation, the CBR administration is considering an option to change the TBR's format by involving it in some other Ukrainian protected areas that directly adjoin the Romanian nature park "Maramures Mountains" (in particular, the Verkhovyna and Cheremosh NNP), as well as the national park "Rodna mountains" from the territory of Romania. Steps in this direction will be made soon.

In the context of cross-border cooperation, it's important to mention that the department's scientists are actively involved in relevant international projects. The current project "Transboundary Cooperation for Sustainable Development based on the Ecosystem Approach" is being implemented by an old partner of CBR – the University for Sustainable Development from the city of Eberswalde (Federal Republic of Germany). Within this framework, the department's staff recently participated in the international conference, which was held from the



**IUCN Expert Dr. Hervé LETIÈRE (Switzerland) and Head of one of CBR departments Ms. Victoria GUBKO during field assessment of the Chornohora field division, September 15, 2011**

5<sup>th</sup> to 7<sup>th</sup> December, 2017 on the basis of the University. This project, under the East-West-Dialogue Program, is being implemented by this institution during 2017-2018 together with the National Forestry University of Ukraine (Lviv, Ukraine), the Carpathian Biosphere Reserve (Rakhiv, Ukraine), the Stefan cel Mare University (Suceava, Romania), the National Institute for Forest Research and Management ICAS (m. Câmpulung Moldovenesc, Romania), the State University of Moldova (Chisinau, Moldova) and is funded by the DAAD Academic Exchange Agency. The goal of the project was to establish cooperation and exchanges between academic institutions, educational establishments and experts on cross-border cooperation for sustainable development based on an ecosystem approach. The Carpathian Biosphere Reserve was one of the main project partners, and the scientists of the institution were involved in its implementation as experts. 24 people from the International Union for the Conservation of Nature (IUCN or IUCN), representatives of protected areas, scientific institutions, higher education institutions, NGOs, etc. from Germany, Moldova, Romania and Ukraine participated in the conference. The Carpathian Biosphere Reserve was represented by the employees of the Department – Yuriy Berkela and Vasyl Pokynchereda. The international conference was devoted to the issues related to the current state of the transboundary





cooperation and development of joint future plans in order to deepen and improve it. 12 presentations were made during the meeting, in particular, Vasyl Pokynchereda presented information about the international activity of the institution in recent years, and also commented on the situation regarding the establishment of the Ukrainian-Romanian Biosphere Reserve in the Maramures Mountains. As a result of the presentations, discussions were held on future joint project proposals related to the Ukrainian-Romanian cooperation in the context of creating the aforementioned transboundary biosphere reserve. Also, the Carpathian Biosphere Reserve's staff members took part in a panel discussion, the topic of which was the political, socio-economic and ecological situation in Ukraine. It was organized jointly by the city hall of Eberswalde with the University of Sustainable Development, involving local mass media. Within the framework of the conference there was a field trip held to the National Park "Lower Oder Valley" (Germany), as well as to the park with the same name on the territory of Poland. Participants got acquainted with the activities of these protected areas.

## COOPERATION WITH THE EUROPEAN WILDERNESS SOCIETY

To the new directions of international activity of CBR is cooperation with the European Wilderness Society – an ecological non-profit organization created for the protection of wildlife, which aims to identify, manage and propagate the last-remaining European wild rivers, oldgrowth and primeval

forests, protected areas and wildlife in general. The Society positions itself as the only European wilderness conservation organization and is part of a global movement for the conservation of last-remaining large wilderness areas in the conditions when many European countries have committed themselves to protecting up to 2% of wilderness in their territories, in accordance with the Strategy on Biodiversity.

The Society has developed the European Wilderness Quality and Audit System (EWQA), which is globally recognized and is based on more than 300 indicators, divided into 9 principles and 72 criteria. According to them, each identified wilderness area, which includes, in particular, categories such as wilderness area, a wild river or forest etc., is estimated by 4 levels of the European Wilderness Network: bronze, silver, gold, or platinum award. Currently, in Ukraine, very few protected areas are certified by the European Wilderness Society, including CBR. Thanks to close cooperation with the Society experts, in 2016-2018 CBR certified 6 wilderness areas that include Uholka-Shyrokyi Luh with an area of 7,117 hectares, rated for the highest category – platinum; two areas of wild forest – Uholka-Shyrokyi Luh and Kuziy-Trybushany, respectively, 7117 hectares (platinum) and 1370 hectares (bronze), and three wild rivers: Mala Uholka, 7 km long, Velyka Uholka – 8 km, and Shyrokyi Luh – 9 km. All wild rivers are valued at the platinum level. But at this the potential of CBR's territory is far from being completed. A lot of work waits for us ahead, which will surely bring new achievements and outcomes.

## WETLANDS OF INTERNATIONAL IMPORTANCE

Due to its unique territorial structure, the Carpathian Biosphere Reserve possesses tremendous biodiversity, in particular at the ecosystem level. Wetlands are well represented on its territory, among which there are those that meet the criteria of the Ramsar Convention. In order to identify such sites, during 2008-2010 the deputy head of the department Vasyl Pokynchereda organized several complex scientific expeditions. As a result of that work, application forms have been prepared and necessary maps have been developed for listing five natural objects from the territory of CBR into the List of the wetlands of international importance, namely the Narcissi Valley with an area of 256 hectares (Khust district), Karst cave Druzhba with an area of 0.13 hectares (Tiachiv district), and three highland wetlands from Rakhiv district: "Ozirnyi-Brebenskul" with an area of 1656.91 hectares, "Svydovets Highland Lake" with an area of 1629.19 hectares, and "Maramures Highland Lake" with an area of 2128 ha. In 2011, the Cabinet of Ministers of Ukraine issued an order "On the approval of granting to wetland sites the status of the Wetlands of International Importance", according to the documents No. 147-p dated on February 23, 2011 and No. 895-p dated on September 21, 2011, it was agreed to grant the status of wetlands of international importance to three natural sites from the territory of the Carpathian Biosphere Reserve, namely the Narcissi Valley with an area of 256 hectares (Khust district), the Karst Cave

## European Diploma

for the Carpathian Biosphere Reserve  
awarded by the Committee of Ministers  
of the Council of Europe

Whereas it is desirable to promote close co-operation between member countries of the Council of Europe, with a view to conserving and enhancing the natural environment of the peoples of Europe, for the material and spiritual well-being of present and future generations;

Whereas the Committee of Ministers has instituted to that effect a European Diploma to place under the sponsorship of the Council of Europe certain protected landscapes, reserves and natural features of European interest,

I, Daniel Tarschys,  
Secretary General of the Council of Europe,  
hereby certify that:  
The Committee of Ministers,  
Having regard to Resolution (65) 6  
instituting the European Diploma;  
Having taken note of the proposal made  
by the Bureau of the Committee for the Activities  
of the Council of Europe  
in the field of Biological and Landscape Diversity;  
Having noted further the consent of the Government  
of Ukraine;  
Having deliberated thereon,  
Has, in its Resolution (97) 21,  
solemnly awarded the present diploma  
for the **CARPATHIAN BIOSPHERE RESERVE**  
to the **Ministry for Environmental Protection  
and Nuclear Safety of Ukraine**,  
thereby placing the said reserve under the sponsorship  
of the Council of Europe until 30 September 2002.  
In witness whereof I have hereto appended my signature  
and affixed the seal of the Council of Europe.  
Done at the seat of the Council of Europe  
this 30 September 1997.

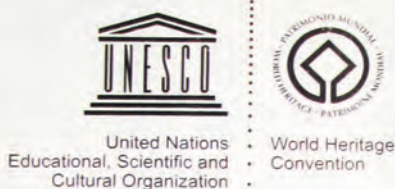
Signed: *Daniel Tarschys*

Secretary General



**The European diploma, which was granted to the Carpathian BR by the Council of Europe; Certificate of the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany"**

Druzhba with an area of 0.13 hectares (Tiachiv district), and the wetland "Ozirnyi-Brebenskul" (Rakhiv district) with an area of 1656, 9 ha. However, the above-mentioned wetlands were not included into the Ramsar List due to changes in the requirements for the application forms and maps made by the Secretariat of the Ramsar Convention. Now the Department is working on making corrective adjustments and is planning to complete this work in the near future.



## CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

*The World Heritage Committee  
has inscribed*

*Ancient and Primeval Beech Forests of  
the Carpathians and Other Regions of Europe*

*on the World Heritage List*

*Inscription on this List confirms the outstanding  
universal value of a cultural or  
natural property which requires protection for  
the benefit of all humanity*

DATE OF INSCRIPTION

*12 July 2017*

*Irina Borova*

DIRECTOR-GENERAL  
OF UNESCO

## FRAMEWORK CONVENTION ON THE PROTECTION AND SUSTAINABLE DEVELOPMENT OF THE CARPATHIANS (Kyiv, 2003)

In order to put into practice the provisions of the Carpathian Convention in 2011, the Pan-Carpathian project "BIOREGIO-Carpathians: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians" was launched, which ended in summer of given year.

In this context, it is important that since 2011, the Carpathian Biosphere Reserve together with the Nature Park "Maramures Mountains" were involved in the implementation of a large-scale international project "BIOREGIO-Carpathians: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians".

This project tasks the Ukrainian and Romanian partners – to create all the necessary prerequisites for the organization of a transboundary biosphere reserve in the Maramures Mountains. On July 27-28, 2011, V. Pokynchereda

participated in the kick-off conference of the international project "BIOREGIO-Carpathians", which took place in Romania (Brasov County, Piatra Craului National Park). During the conference, a meeting with the representatives of the Maramures Mountains Nature Park administration was held, during which the organizational and technical principles of future cooperation within the project were discussed.

On October 8, the delegation of the Maramures Mountains Nature Park visited CBR together with the managers of the BIOREGIO-Carpathians project. During the workshop, a plan for cooperation at the institutional level and joint activities within the framework of this project were developed. Also, on November 26-28, 2012, a seminar of experts of the international project "BIOREGIO-Carpathians" (with the participation of CBR team members) took place in Baia Mare, Romania.

In 2014, team members of the Biosphere Reserve participated in

the following activities as part of this project:

1. Fourth International Meeting of the WP3 Working Group of the project "BIOREGIO-Carpathians: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians" (January 29-30, 2014, Banska Bistrica, Slovakia) in order to agree on the list of species and habitats, as well as the list of invasive species of the Carpathian region.

2. Third International Meeting of the WP6 Partners (Pilot Territories) of the BIOREGIO-Carpathians Project: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians (April 15-16, 2014, Orsova, Romania) in order to strengthen international cooperation in the sphere of nature protection. During the meeting, excursions to the Iron Gate Nature Park (Romania) and Djerdap National Park (Serbia) were held.

3. 4<sup>th</sup> International Meeting of the 6<sup>th</sup> Work Package of the BIOORGIO-Carpathians Project: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and Ecological Connectivity in the Carpathians (April 29-30, 2014, Viseu de Sus, Romania). The meeting discussed the prospects of cooperation between transboundary protected areas, in particular, between the Maramures Mountains Nature Park (Romania) and the Carpathian Biosphere Reserve (Ukraine).

4. Final Conference of the International Project "BIOREGIO-Carpathians: Integrated Management of Biological and Landscape Diversity for Sustainable Regional Development and ecological connectivity in the Carpathians" (June 12-13, 2014, Poiana Brasov, Romania). The conference was attended by over 100 participants, among them – the representatives of government structures, project partner institutions from Ukraine, Romania, Hungary,

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

*Yuriy BERKELA,  
manager of the Department  
of Scientific Research  
and International  
Cooperation of CBR*



1. The Carpathian Biosphere Reserve plays an important role in the European process of nature conservation, and it is also essential in the role of a component part of the UNESCO World Heritage Property and a MAB UNESCO biosphere reserve. In the recent decades our institution is worthily representing Ukraine in the international arena, and it is well-known to international conservationists and scientists.

2. The status of a MAB UNESCO biosphere reserve; the UNESCO World Heritage Property; CBR's territory expansion; international cooperation with numerous scientific institutions of

the globe; scientific and popular-science publications.

3. It is necessary to improve and give a new meaning to the already existing fields of activity.

4. Nature protection and research are for sure noble, interesting and important activities, which, unfortunately, do not have a sufficient material and logistic support.

5. Introduction of new information technologies in the institution.

6. Internship at the Swiss Federal Institute of Forest, Snow and Landscape Investigations, participation in various international events.



## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



***Mykola RYBAK,***  
***Director of the Carpathian***  
***Biosphere Reserve,***  
***Honored Conservationist***  
***of Ukraine***

1. The Carpathian Biosphere Reserve, especially after establishing the transit zone (2016), became a functional biosphere reserve in the frameworks of the World Network of UNESCO Biosphere Reserves, which, in accordance with the decision of the International Coordinating Council (June 2017), fully complies now with the requirements of the statutory framework for world biosphere reserves.

After the successful implementation of the project on the inclusion of the beech primeval forests of the reserve into the UNESCO World Heritage List as parts of "Primeval Beech Forests of the Carpathians" (2007), and the subsequent expansion of the Property into "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany" (2011) and "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" (2017), the Carpathian Biosphere Reserve has become a powerful catalyst in

the world's environmental protection process.

Ultimately, having confirmed its compliance with UNESCO statutory framework for biosphere reserves, it has become one of the leading protected areas in Ukraine that demonstrates the results of transboundary and international cooperation.

2. The most important achievements of CBR are undoubtedly the designation and expansion of the UNESCO World Heritage Property, where the primeval beech forests, covering nearly 21,000 hectares, are the largest part of it. Over 22% of the Property is under protection of the reserve.

It is also noteworthy that, according to the results of an audit conducted by the European Wilderness Society in the Uholka-Shyrokyi Luh and Kuziy-Trybushany massifs, the two CBR's clusters have become members of the European Wilderness Network (2017). The named territories received the corresponding certificates, and the territory of the Uholka-Shyrokyi Luh massif, where the largest component of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" is located, has received the highest level – platinum – certificate.

Thus, there was a new opportunity to present the Carpathian Biosphere Reserve on a wider scale and to inform the European and global community about the natural values of the Carpathians, to stimulate the development of the recreation potential of the region.

Designation of the transition zone of the Reserve (2016), confirmation of compliance of the latter with the UNESCO statutory framework of biosphere reserves (2017), establishment and effective work of the Coordinating Council, drafting and signing of the memorandum of understanding by the administration of the Reserve with the authorities and local self-government bodies on cooperation in preservation and non-exhaustive use of natural complexes of the Carpathian Biosphere Reserve as part of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe", as well as the implementation of sustainable development in the surrounding areas (2018) should also be considered to be really important achievements of CBR.

3. In order to achieve better results in ensuring compliance with the conservation regime throughout CBR, it is necessary to initiate an increase in joint inspections held by the employees of the Ranger Service of the reserve together with law enforcement officers and the District Ecological Inspection to prevent and detect illegal activities.

By strengthening cooperation with the territorial communities and involving the population into joint activities aimed at preservation of the environment, management of CBR and solving sustainable development issues in the surrounding areas.

**The manager of the implementation organization of the Ukrainian-German project "Support to the protected areas of Ukraine" Michael BROMBACHER presents the keys of a 4x4 car Renault DUSTER to the Director of CBR Mr. Mykola Rybak (Kyiv)**

With the aim to develop ecotourism in the territory of CBR, we should involve business representatives in joint recreational activities.

It is recommended to establish a capacity-building center for eco-education on the basis of the reserve to train rangers from other protected areas of the Carpathian region.

4. To ensure nature protection and compliance with environmental legislation when conducting environmental and forest management measures.

It is better to perform these tasks in the territories of the protected area system. In the territories of forestry enterprises, due to imperfect environmental legislation and other factors, the Carpathian nature is often under a threat of destruction (continuous logging, use of caterpillar tractors in timber skidding, etc.). As a result, the environment is destroyed by floods, mudflows and landslides.

It is important for PAS, including our reserve, to strengthen the status of the conservationist, his material and financial support. This can be done by providing off-road transport, the purchase of service weapons, uniforms, office equipment, etc.

5. I have continuously been working at the Carpathian Biosphere Reserve for over 35 years: from a forest ranger, conservation master-ranger, chief forester, deputy director up to the director of the institution. The success of my work is confirmed by numerous diplomas of various levels and the award of the honorary title "Honored Conservationist of Ukraine" (2009). I published more than 30 scientific papers. After completing my studies at the National Transport University (May 2019) I will get my second higher education by the specialty "Master in Ecology". The plans are to improve English language skills. I plan to continue working at the Carpathian Biosphere Reserve, to organize the proper fulfillment of the basic objectives in nature conservation for the future generations. In particular, to implement measures to deepen the cooperation between the Reserve administration and the wide public

and business representatives in the field of conservation and sustainable use CBR's natural complexes (as part of the transnational UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe") and in sustainable development of the territories adjacent to the reserve.

6. There were many memorable events in the reserve for 35 years. Here are just some of them:

While working as a forest ranger in the Chornohora division (1984), performing or conservation measures in my ranger district, I met armed poachers. I was still a young ranger at the time, and it was not easy to pull myself together. Still, I did my best to deal with the situation, though I was there without any weapon. The offenders rushed to flee... I remember this case to emphasize once again the difficult mission of the guardian of the Ukrainian Carpathians.

Remember a pleasant event when I received a proposal from the director to become a manager of a newly-created Maramures field division (at that time – forestry district) of the Carpathian Nature Reserve (1990), and to become Chief Forester (1997) after seven years in that position.

1998, 2001, 2008, 2010 – liquidation of the consequences of catastrophic floods in the territory of the Carpathian Biosphere Reserve... Due to lack of funds and lack of appropriate equipment, as well as the unpreparedness of both the reserve and the Ministry of Environment of Ukraine, conflict situations with territorial and territorial situations arose, because during the summer period, because of the destroyed roads, bridges and shore retaining walls, they were not able to bring cattle up to the meadows in time, and to bring dairy products down from there. In all these cases, I was the head of the liquidation working groups as the Deputy Director – Chief Environmentalist of the reserve.

In 2010, when I was a council member of the Rakhiv District Council, during one of its meetings my fellow council members unanimously (except for me and the manager of the Keveliv field division V. Verbitskyi) decided to send to the highest governing bodies of Ukraine

an appeal to annul the Decree adopted in 2010 "On the expansion of the territory of the Carpathian Biosphere Reserve". I sent a complaint against this decision to the prosecutor's office in Rakhiv district.

An important event also took place on April 30, 2013, when, at my initiative, as the Director of the Reserve at the time, the first meeting of the Coordination Council was held, during which the memorandum on cooperation in the field of conservation and sustainable use of natural complexes of the Carpathian Biosphere Reserve as a part of the Ukrainian-Slovak German UNESCO World Heritage Site "Primeval Beech Forests of the Carpathian and the Ancient Beech Forests of Germany" was signed with all the mayors of settlements of the Rakhiv district, as well as the managers of the Rakhiv District State Administration and Rakhiv District Council (24 signatures).

The signing of the memorandum marked the beginning of a real cooperation between the reserve's administration and territorial communities on joint resolving of the issues of conservation and sustainable use of its natural complexes and implementation of the Presidential Decree No. 25 dated on January 14, 2010 "On the expansion of the territory of the Carpathian Biosphere Reserve".

An important event for me as the director of the institution was also an official handing of the keys to the off-road vehicle Renault DUSTER in Kyiv. This car was purchased at the expense of the Ukrainian-German project "Support to nature protected areas in Ukraine" (May 2018).





Austria, Italy, Slovakia, Czech Republic, Poland, Serbia and others. There were presented and discussed the main results of all work packages of the project and the final publication. There were also reports made on the implementation of the South-Eastern Europe Program, Green Mountain projects, UNDP-GEF "Improving the financial sustainability of the Carpathian system of protected areas" etc. Within the framework of the Conference, 4 workshops were held on various activities within the framework of the project and 2 field trips to the Piatra-Craului National Park.

The project also published a number of scientific works on rare species of flora and fauna, rare types of habitats, as well as invasive species of plants and animals from the Carpathian region, which were written by CBR researchers. Among them are: Draft Carpathian Red List of Threatened Mammals (Mammalia), Draft Carpathian Red List of Forest habitats, Draft Red List of Vascular Plants of the Carpathians, Draft list of invasive alien species of the Carpathian region, etc.

## EUROPEAN COUNCIL DIPLOMA FOR PROTECTED AREAS

In 1997, the Carpathian Biosphere Reserve was awarded with the Diploma of the Council of Europe for Protected Areas. The reason for this was the remarkable achievements in preserving and exploring the natural complexes of

the Carpathians. It is important that even today our institution remains the only protected area in Ukraine, which holds this honorary award. Employees of our Department regularly prepare annual reports, as well as organize inspection visits for the experts who carry out checkup of the institution regarding its compliance with the strict Diploma criteria. Due to the hard work of its team members in 2002, 2007 and 2012, the validity of the Diploma of the Council of Europe for CBR was prolonged for subsequent periods.

In particular, in 2001, the first expert evaluation of CBR, which formed the basis of the relevant decision of the Council of Europe, was made by the famous Swiss scholar Dr. Mario Broggi. In 2006, a Polish researcher Dr. Jadwiga Sienkiewicz from the Institute of Environmental Protection of the Polish Academy of Sciences, Warsaw, worked within CBR's territory.

In 2012, the next term of the Diploma's validity expired, and as a result the procedure for extending this award's duration was carried out. The Secretariat of the Council of Europe appointed Mr. Hervé Letier (Switzerland), an IUCN expert, to accomplish this task. A field mission of the expert on the territory of CBR lasted from the 12<sup>th</sup> to 16<sup>th</sup> of September 2011, during which the meetings with the employees of the institution, representatives of local / regional authorities and other stakeholders acting within the scope of CBR's activity were held. The expert also visited the territory of three field divisions, where he became acquainted with the work of the ranger service and the status of conservation regime observance, the expert also assessed the effectiveness of natural complexes protection and the infrastructure available there. The outcome of the mission, based on the prepared report, was the renewal of the European Diploma of the Council of Europe for protected areas for the Carpathian Biosphere Reserve for the next 10 years. The official decision was made in March 2012.

## ORGANIZATION OF INTERNSHIPS AND STUDY TOURS FOR THE STUDENTS FROM THE LEADING UNIVERSITIES OF EUROPE

The scope of responsibilities of the staff of the department includes the provision of internships and study tours on the basis of the reserve for the students of higher educational institutions from Ukraine, as well as Europe as a whole. In particular, every year we organize the stay of bachelor and master students from the University of Sustainable Development from Eberswalde (Germany), Writtle University College (Great Britain), National University of Kyiv-Mohyla Academy and many other leading universities. Also, the department's employees provide conditions for writing graduation bachelor's and master's theses for the students of the above-mentioned higher education establishments.

Cooperation in this area with the University of Sustainable Development from Germany is particularly productive and demonstrative. In 2004, the students of this university, on their own initiative, visited CBR in order to study the primeval forests protected in its territory. An excursion to the forest sites was conducted by researcher Vasyl Pokynchereda, who led them to the most interesting natural complexes of the reserve. The result of this visit was starting up cooperation at the level of institutions, which at first only about the organization of students' field trips. Over a period of time, more than 500 students from more than 15 countries of the world had a chance to enrich their experience during the study tours to CBR! Today, this cooperation has become much wider and includes a number of directions that go far beyond the educational process. It contributed to attracting a wider range of partners from Ukraine (for example, the National Forestry University of Ukraine, Lviv) and from abroad (Moldova State University from Chisinau, Romanian University of Stefan Cel Mare, etc.). Each year, this cooperation is becoming more active and is gaining new insights and perspectives.

## ABOUT ACTIVITY OF THE ADMINISTRATION OF CBR ON CONSERVATION OF BEECH PRIMEVAL FORESTS

**Mykola RYBAK,**  
*Director of the Carpathian  
Biosphere Reserve,  
Honored Conservationist  
of Ukraine*

**E**leven years have passed since the inscription of CBR's primeval beech forests into the UNESCO World Heritage List.

Protection of the territory of the UNESCO World Heritage Property and its buffer zone, and this is almost the entire territory of the reserve, is secured by the ranger service (the State Service of Nature Protection), and made up of 150 staff members.

The first thing that was done by the administration of the reserve was delineation of the boundaries of the UNESCO WH Property in field and installing information boards and signs.

Secondly, taking into account that in the scope of CBR's location there are 40 settlements where about 100 000 people dwell, CBR's administration, in order to ensure reliable preservation of beech primeval forests takes all the necessary measures to deepen its cooperation with local communities in the field of sustainable development of the adjacent territories and traditional nature resource management by the population on the territory of the reserve outside the World Heritage Property, namely – in the buffer zone and zone of anthropogenic landscapes.

It is important to note that the biosphere reserve is a protected area, which operates in accordance with the Law of Ukraine "On the Protected Areas System of Ukraine", and where, in accordance with functional zoning, various restrictions on the use of natural resources are established. In particular, in the reserve's area, any activity other than scientific research is prohibited, and the buffer zone is a subject to significant restrictions in terms of human activities too, while in the zone of anthropogenic landscapes the traditional nature resource management is permitted

in accordance with the spatial planning of the territory and on the basis of the decision of the Scientific and Technical Council of the reserve.

It is well-known that one of the main functional advisory bodies of the world's biosphere reserves is a Coordination Councils, which includes the representatives of all key stakeholders.

The first meeting of the Coordinating Council of CBR with the participation of representatives of local self-government bodies, executive authorities, managers of state-owned forestry enterprises, tourism businesses etc. took place on April 30, 2013.

The key outcome of the Council's meeting was signing a memorandum on cooperation in the field of conservation and sustainable use of the natural complexes of CBR as a part of the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany" within Rakhiv district of Zakarpattia region.

The Memorandum was signed by the author of these lines as the director of the reserve, by all the mayors of the settlements of Rakhiv district

(21 signatures), the head of the District State Administration and the chairman of the District Council.

The aim of the cooperation was to ensure the implementation of the Decree of the President of Ukraine "On the expansion of the territory of the Carpathian biosphere reserve" dated January 14, 2010, No. 25.

The parties also agreed to unite efforts on the conservation and sustainable use of natural complexes of CBR on the basis of a systematic harmonization of the ecological, economic, social and other public interests of the territorial communities of Rakhiv district.

A year earlier, a similar Memorandum on Cooperation was signed between the Carpathian Biosphere Reserve and the Tiachiv District State Administration within the Tiachiv district of Zakarpattia region.

The Carpathian Biosphere Reserve, in accordance with the current environmental protection legislation and the spatial planning of the territory of the institution, gives the local population, on a general basis, the right to use the zone of anthropogenic landscapes for cattle grazing, grass mowing, and collecting



During the meeting dedicated to the issues of expanding the Protected Areas System of Ukraine (the third on the right in the first row – the Minister of Ecology and Natural Resources of Ukraine Mr. Ostap Semerak). The Uholka Information and Tourist Center "Primeval Beech Forests as the UNESCO World Heritage Property", 2016



## Primeval beech forests of Uholka; the skies are calling!

Important steps in establishing close collaboration with the communities were the meetings of the CBR Coordination Council, which have taken place on October 20, 2016 and May 24, 2017. They unanimously endorsed the activities of the administration of the Carpathian Biosphere Reserve and sent a clear signal from most of the territorial communities about their willingness to deepen cooperation.

The Coordination Council has adopted a number of proposals and recommendations for the administration of the reserve, in particular on setting the issues of joint recreational and ecological-educational activities, as well as on the regulation of the general and special use of natural resources.

The Council unanimously supported CBR's efforts to expand its territory, in particular at the expense of primeval beech forest sites of Tiachiv district, and appealed to the Ministry of Environment of Ukraine to simplify the process of obtaining permits for the biosphere reserve to carry out sanitary activities and other logging operations without obtaining annual quotas on the special use of natural resources.

At its meeting on October 20, 2016, the Coordination Council of CBR arrived at the decision to recommend the administration of the institution to prepare appropriate agreements for deepening cooperation between the biosphere reserve and the territorial communities of the surrounding settlements. In fulfillment of the afore-mentioned decision during

mushrooms and berries for their own consumption.

Developing cooperation with territorial communities and relying on the requests sent by the local councils, the reserve in 2016 and early 2017 concluded agreements with territorial communities on cooperation in improving the management of traditional highland farming, preservation of highland farming culture and sustainable use of natural complexes in the settlements of Dilove, Kosivska Poliana, Luh, Bohdan and Lazeshchyna of Rakhiv district. In other settlements such agreements are currently under consideration.

Due to sanitary and other types of logging, about 7.000 cubic meters of fuelwood and construction timber are annually allocated for the needs of the local population living in the area of CBR's activity.

Primeval beech forests attract tourists. In Mala Uholka, where the biggest primeval beech forest site is located, an information center has been constructed – "Primeval beech forests as a UNESCO World Heritage Property". Ecological and scientific trails are designed. Scientific research of natural processes in the primeval forests is underway. A number of forest sample plots were laid, etc.

Special attention is paid to the development of the recreational infrastructure by the administration of CBR. As a result, visits to the recreational sites of the reserve increase every year. Today, the tourist flow is more than 40.000 visitors a year. And this is an extra income for local residents involved in providing various recreational services to visitors (accommodation, meals, guided tours, etc.).





2016 and 2017 there were concluded Declarations on Cooperation with 17 territorial communities, namely, Bohdan, Luh, Vydrychka, Roztoky, Lazeshchyna, Yasinia, Chorna Tysa, Kvasy, Bilyn, Rakhiv, Kostylyvka, Dilove, Luh and Kosivska Poliana of Rakhiv district, and Uhliа, the Shyrokyi Luh and Velyka Uholka of Tiachiv districty.

In this document, the parties expressed their intentions regarding mutual support and promotion of cooperation in the implementation of an environmentally responsible, socially beneficial and economically balanced development of these settlements, as well as intentions to collaborate in the area of preservation of valuable natural and cultural complexes and objects, and sustainable development of the Carpathian region and enhancement of socio-economic prosperity of the given territorial communities.

In 2016, the reserve also signed the Memorandum on Cooperation with the Zakarpattia Regional Department of Forestry and Hunting for designation of the territory of sustainable development (the transition zone of the biosphere reserve) within individual state forestry enterprises in order to ensure forest management practicing on the basis of sustainable development in the region.

The level of the population's support of CBR in primeval beech forests protection as a UNESCO World Heritage Property also depends on the ability of the reserve to help the communities in ensuring sustainable development of the settlements and their improvement. CBR, in comparison with the neighboring state-owned forestry companies, has limited

capabilities in providing direct assistance, but it has significant opportunities for attracting investment and launching joint projects.

In particular, the implementation of priority measures in the territorial communities, as foreseen by the Ukrainian-German project "Support for protected areas in Ukraine" (now being implemented in Ukraine), is the first step towards finding some real solutions for the community problems and, as a result, it will strengthen the cooperation between the reserve and local communities in the primeval beech forests conservation, and also it will improve its image.

Important legal acts to strengthen the role of the Carpathian Biosphere Reserve in implementing the ideas of sustainable development in the mountain settlements, which have been prepared, among others, on the initiative of the staff members of the reserve, especially Professor Fedir D. Hamor, are: the Instructions of the President of Ukraine and the Order of the Cabinet of Ministers of Ukraine on sustainable development and improvement of settlements of the Ukrainian part of the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany", as well as the Order of the Cabinet of Ministers of Ukraine on procedure and sources of funding for these measures.

Some of the measures that are envisaged in the aforementioned legal acts have already been implemented.

When developing the CBR Management Plan, the primeval beech forests of the reserve, as a component of

the UNESCO WH Property "Ancient and Primeval beech Forests of the Carpathians and Other Regions of Europe", will be almost completely included in the core area. Accordingly, its area will increase from 29.6 to 36.2%, primarily due to the buffer zone. However, these changes will not lead to any territorial reduction of those areas of the biosphere reserve, where the traditional nature management is conducted. Appropriate maps are being prepared. Also, taxation descriptions will be carefully prepared and forest site plans for the field divisions, their forest compartments and sub-compartments within the territory of the primeval beech forests during the development of forest management materials will be made. In 2016, the reserve was given special funding for implementation of the first part of these objectives – the field works. In 2018, the funds were allocated for carrying out in-office studies. Now we are expecting full completion of the works on forest management planning.

Of course, there are certain problematic issues that need to be addressed. For example, the level of wages paid to the employees of the Ranger Service.

Today, the monthly salary of a field division's manager, who, in accordance with the Regulations on CBR, is the leader of the main structural unit, is very low and makes only 4339 hryvnias, and the salary of an inspector amounts to 3391 hryvnias, while the level of the minimum wage in Ukraine is 3723 hryvnias per month.

Such a situation makes it impossible to hire people on vacant positions, the number of which is increasing, especially the skilled personnel. For example, the position of the manager of the Kisva field division remains vacant for more than 2 years, same as the positions of the deputy managers of the Petros-Hoverlianske, Rakhiv-Berlybaske, Bohdan-Petroske and Uholka divisions. As for the forest inspectors and other ranger positions, in order to at least somehow keep the situation under control, we are ready to hire people on the vacant positions even without any special education.

Adding here the fact that the members of the ranger service does not have any appropriate uniform, transport means, service weapons or communication facilities, one can understand why we have a large staff turnover and lack of trained specialists. This, of course, affects the level of protection of the UNESCO World Heritage Property and the observance of the established conservation regime here.

# HISTORY, ACHIEVEMENTS AND PERSPECTIVES OF ZOOLOGICAL RESEARCH IN THE CARPATHIAN BIOSPHERE RESERVE



**Yaroslav DOVHANYCH,**  
*head of the CBR's  
Zoological Laboratory*

The massifs of the Carpathian Biosphere Reserve are located in various parts of Zakarpattia region (Transcarpathia), so information about its wildlife can be found in the works of the zoologists who have studied this region.

For a long time (several centuries), Transcarpathia was part of Hungary, and most of the faunal studies were performed by Hungarian zoologists. Along with them, we can also name Polish and German scientists among the researchers of the local fauna. They mainly studied the area of Chornohora, which is now is the largest massif of the Carpathian Biosphere Reserve. The first scientific work, in which some animal species data are presented for the territories that are now part of CBR, is the publication of G. Cueil (1819). Lists of mammals of the Maramures region – an area where the Maramures massif of the reserve is now located – are provided in the works of K. Cardos (1876) and

K. Beskyd (1929). In 1919 Zakarpattia became part of Czechoslovakia and the study of fauna was carried out here mainly by the specialists of this country.

Entomological studies in the territory of the reserve began in 1982. They were conducted by both full-time entomologists and specialists from invited institutions, in particular the Institute of Zoology of NASU, the Lviv Museum of Natural History, NASU, Uzhgorod and Lviv National Universities and other universities of Ukraine and the former USSR. Great contribution to the study of the entomofauna of the reserve was made by E.K. Liashenko, who had been researching the Lepidoptera and some other insect groups for 35 years.

The study covered a large number of taxonomic units of invertebrates. It should be noted that, compared to other groups of animals of the reserve, the diversity of invertebrates is the richest both in terms of species and number of individuals. Today, 3268 invertebrate species have been identified in the reserve. The program of scientific research of invertebrates is carried out in accordance with the requirements of the main reporting document of the reserve – "Chronicles of Nature".

The first inventory of amphibians at CBR was conducted by O.O. Luhovyi (1988), and the data collected by him had long been used to describe the species composition of the reserve. The last most thorough study of the fauna was conducted by scientists of the Zoological Laboratory of CBR Vasyl Pokynchereda and Vasyl Chumak within the Project "Conservation of Biodiversity of the Carpathians" and was included in the monograph "Biodiversity of the Carpathian Biosphere Reserve" (1997). In this study, the species composition of Amphibian fauna and the distribution of individual species were

identified. Further research on the species composition and distribution of individual species on the territory of the reserve was continued by Vira Pokynchereda together with colleagues and by herself (2010-2018). Today, the amphibian fauna of the reserve includes 15 species, 6 of which have representatives of an order of Caudata, the rest are Ecaudata.

The reptiles in CRB have been studied since the establishment of the reserve in 1968. The first complete inventory was carried out in 1982-1985 and published by O.O. Luhovyi (1988). This paper provides an annotated list of herpetofauna and brief data on species distribution and number. The following inventory, in connection with the expansion of the territory of the reserve, was conducted in 1991-1995 by the scientist of the reserve Vasyl Pokynchereda. The data on species composition (7 species), species distribution and recommendations for their conservation were published in the monograph "Biodiversity of the Carpathian Biosphere Reserve" (1997). Some ecological peculiarities of reptiles are described in the work by Olena Yurkuts (1998). Further studies of herpetofauna were conducted on the territory of the reserve in the period 1999-2016 by Yuriy Popovych (2014, 2016). The current state, distribution within the massifs of the reserve, seasonal activity and features of biology (nutrition, seasonal activity, reproduction) are described.

More than 50 scientific papers are published on avifauna from territory of the reserve since its creation in 1968. Much of them are dedicated to particular bird groups in the region or to the study of some zoological or ecological issues of particular species. Therefore, they only provide some information about the birds in the protected area. The main ones are Talposh (1972), Krochko (1973),



Roe deer;  
CBR researcher Vira POKYNCHEREDA works with young nature-lovers

Zubarovskyi (1977), Vainahiy, Horban (1992) and others. The first inventory of the ornithofauna of the reserve was conducted in 1981-1985 (Luhovyi, 1988). Since then several times there have been conducted inventories of avifauna and specification of bird lists (Huziy, 1984-1988, Hodovanets, 1995-1997, 2004, 2008, 2016).

Theriofauna of the modern territory of the Carpathian Biosphere Reserve started to be studied in the prewar period. During the Soviet era, such famous researchers as V. Abelentsev, I.I. Kolyushev, I.I. Turianyn, K.A. Tatarinov, Yu.I. Krochko worked here. After establishing the scientific department at the reserve, theriological research on its territory was conducted by Ya.O. Dovhanych, V.F. Pokynchereda, sometimes in cooperation with specialists from other research institutions. The first inventory of mammals was conducted by Ya.O. Dovhanych in 1988. Since then, the ecology of rodents (Dovhanych, 1988, 1990), ungulates (Dovhanych, 1993, 1995, 1996, 2013, 2014) and large predators (Dovhanych, 1986, 1997, 2002, 2004, 2006, 2010-2017) has been studied in depth.

Since 1985 the research of the chiropterous animals on the territory of CBR is being carried out by Vasyl Pokynchereda. His main focus was research of cave groups of bats during their hibernation, in particular their structure and dynamics. During more than 30 years of research, Vasyl Pokynchereda succeeded to identify the species composition of the bats of the protected area (23 species), the absolute number of winter colonies of bats and the long-term dynamics of changes, as well as their spatial, age, sexual and species structure, also he determined the impact of the microclimate and its changes on the bats' hibernation character, learned a lot of new things about the ecology and phenology of certain species. All this information is reflected in numerous works (1990, 1991, 1993, 1996-1998, 2004, 2005, 2012, 2014).

## RESULTS OF THE ANIMAL KINGDOM RESEARCH

The main task of the Carpathian Biosphere Reserve (CBR), in accordance with the Law of Ukraine "On the Protected Areas System of Ukraine", is to preserve the most typical natural complexes of the

biosphere in their natural state, to carry out a background environmental monitoring, to study the natural environment and its changes under the influence of anthropogenic factors. The animals is an integral part of natural ecosystems, so their study is an important area of the reserve's activity.

Today, as a whole, the fauna of all groups of terrestrial vertebrates, some insect taxa, including Ground beetles, Staphylinidae, Aphidoidea (Homoptera), Lipedoptera (butterflies), and also a class of Myriapoda have been studied. Inventory of spiders, mollusks and worms is partially carried out.

At present, the ecology and population dynamics of mammal groups such as bats and ungulates have been most fully studied at CBR. Nesting bird populations in different forest types, their altitudinal and spatial distribution, phenology, peculiarities of biology of typical and background bird species are deeply studied.

Continuing inventory of invertebrate fauna remains a topical issue of zoological research at CBR. This task can be performed only by invited specialists, since the staff of the reserve's zoological laboratory cannot include specialists in all zoological specialties. The problem is that the budget does not provide enough funds to be paid for the services of the specialists from contracted research institutions.

As of 2018, scientific research has revealed that there are 3583 species of animals in the territory of the Carpathian

Biosphere Reserve: 88 species of worms, 3018 species of arthropods, which include 260 species of Arachnida, 32 species of Myriapoda and 2804 insects, 81 species of mollusks, 1 species of Cyclostomata, 29 species of fish, 15 species of amphibians, 10 species of reptiles, 193 species of birds and 67 species of mammals. In the territory occupying less than 1% of the area of the Ukrainian Carpathians, about 65% of the animal species of the region are sheltered (the proportion of vertebrates is even higher – 76%). As for the rare species of the reserve, their share is about 41% of all "red-listed" species of the Ukrainian Carpathians. But the research continues and new species are discovered every year. Species diversity of animals of the Carpathian Biosphere Reserve, as compared to the fauna of Ukraine and the Ukrainian Carpathians, as of 2018, is shown in the table.

Below you can find the results of animal species research held by the reserve according to systematic groups.

**Mammals.** From the moment of the Carpathian Nature Reserve's establishment in 1968 and until 2017, 67 species of mammals belonging to 6 orders, 17 families and 41 genera have been identified on the territory of CBR.

The most diverse in terms of systematics are the rodent species, which are represented by 5 families and 14 genera, Predators belonging to 4 families and 9 genera, Bats (2 families and 9 genera) and Eulipotyphla (3 families and 5 genera). The order of Ungulates

is represented by only 2 families and 3 genera, and Leporiformes – 1 family and 1 genus. By number of species, the richest are the Bats – Chiroptera (23 species). They are followed by Rodents (19 species), Predators (13 species), Eulipotyphla (8 species). The poorest in terms of species are Ungulates (3 species) and Leporiformes (1 species).

**Birds.** As of 2018, 193 bird species belonging to 17 orders, 46 families and 113 genera have been registered in the Carpathian Biosphere Reserve. The most diverse and species-rich taxonomic group of the modern ornithofauna of the reserve is the Passeriformes (89 species). The second largest in terms of the number of species is the Falconiformes – 22 species. Ciconiiformes, Anseriformes, Charadriiformes, Strigiformes and Piciformes are represented by 8 to 15 species. Notable in the fauna of the reserve is the participation of representatives of the orders of Galliformes, Gruiformes and Columbiformes. They are represented by 5-6 species, respectively. The remaining 7 orders are represented by 12 bird species.

**Reptiles.** The modern herpetofauna of the Carpathian Biosphere Reserve is represented by 10 species, 8 genera, 5 families and 2 orders. The most diverse and species-rich taxonomic groups are the families of the Natricidae and the Lacertidae. Emydidae (European pond turtle), Anguidae (Anguis fragilis), and Viperidae (common European viper) are represented by one species each.



Senior researcher Yevhenyi Liashenko releases the female *Saturnia* (emperor moth) individual, grown in laboratory conditions; a typical inhabitant of primeval beech forests – *Rosalia longicorn*



**Senior researcher,  
PhD (biological sciences)  
Bohdan Hodovanets  
with a little grebe**

**Amphibian.** Currently, the amphibious fauna of the Carpathian Biosphere Reserve includes 15 species, which belong to 2 orders, 5 families and 9 genera. The Caudata has 6 species. They are represented only by one family – Salamander, which includes 4 genera. The order of Acaudate is represented by 9 species of amphibians belonging to 4 families and 5 genera.

Most species of amphibians inhabit both the mountainous and lowland parts of the reserve. The representatives of the green toad group are found only in the lowland part.

**Fish and Cyclostomes.** Fish fauna of water bodies of the Carpathian Biosphere Reserve is studied insufficiently. On its territory 1 species of Cyclostomes (Carpathian Minogue) is registered, as well as 29 species of fish belonging to 5 orders, 8 families and 23 genera. Among the massifs of the reserve, the largest number of species of fish is registered in the water bodies of the Svydovets Massif (17), which is explained by the presence of the largest watercourse of the reserve – the Tisza River in the territory of the massif.

The largest number of fish species is found in the Tisza River (19) and its tributary – the Black Tisza (16). The species found here have not been observed in other streams: common zingel, rainbow trout, burbot, stone loach etc. The least number of species

**TOTAL NUMBER OF ANIMAL SPECIES  
IN UKRAINE, THE CARPATHIANS  
AND THE CARPATHIAN BIOSPHERE RESERVE (AS OF 2018)**

Group of animals	Ukraine	Ukrainian Carpathians	CBR
Mammals	108	85	67
Birds	413	236	193
Reptiles	21	14	10
Amphibian	20	18	15
Fish and Cyclostomes	200	59	30
Invertebrates (apart from insects)	5000	1800	464
Insects	35000	3500	2804
<b>TOTAL</b>	<b>40762</b>	<b>5712</b>	<b>3583</b>

was registered by us in the Khustets river – 11. It should be noted that in the Khustets River there is a peculiar ichthyocomplex of fish species. 9 species of fish are found here, which have not been observed in any other mountain rivers and streams of the reserve.

**Invertebrates.** The fauna of invertebrates, in comparison with other groups of animals of the reserve, is the richest both in species and quantitative terms. As of 2018, 3268 invertebrate species have been identified in the territory of CBR.

According to the research held in 1982-2018, the following systematic groups were the most studied among insects: Coleoptera – 800 species, Lepidoptera – 722 and Hymenoptera – 666 species. This is explained by the fact that by the species composition the representatives of these groups are in generally the most numerous both in Ukraine and in the world, as well as by the availability of relevant specialists in Ukraine. Other taxonomic groups include a relatively small number of species. The following systematic groups of insects, such as Hemiptera, Plecoptera, Trichoptera and Diptera are still insufficiently studied.

The most distributed taxa in the reserve are the following ones: the order of Homoptera – almost all the massifs, the order of Lepidoptera – all the massifs, the order of Coleoptera – almost all the massifs, the order of Hymenoptera – almost all the massifs. Other systematic groups have not yet been studied enough, which may explain their absence in some of the reserve's massifs.

## ENDEMIC SPECIES AND SUBSPECIES OF ANIMALS

There are many species and subspecies of animals found in the territory of CBR, which are found only in the Carpathian region, or only in the Carpathians and in the Balkans. These are Carpathian, Eastern Carpathian and Carpathian-Balkan endemics. For example, mammals such as red deer, lynx, bear, moles, squirrels, birch mouse, European snow vole are represented in the Carpathians by special mountain subspecies: isolated mountain subspecies of deer (*Cervus elaphus montanus* Botezat, 1903), isolated subspecies of lynx (*Lynx lynx carpathica* Heptner 1972), Isolated brown bear subspecies (*Ursus arctos polonicus* Gray, 1864), a small form of mountain moles (*Tapla europaea kratochvili* Grulich, 1969), semi-isolated mountain subspecies of squirrel (*Sciurus vulgaris carpathicus* Pietruski, 1853), which, unlike the nominal subspecies has not black but black-brown fur. The Carpathians are also inhabited by an isolated endemic subspecies of birch mouse (*Sicista betulina montana* Mehely, 1913) and the mountain alpine endemic of the snow vole (*Chionomys nivalis alpinus* Miller, 1908). They all occur on the territory of the Carpathian Biosphere Reserve. In addition, the Carpathian endemic species from the alpine group of voles (*Terricola taticrus* Kratochvil, 1952) and the mountain form of water voles – Sherman's vole (*Arvicola scherman* Shaw, 1801) are distributed in the reserve.

1. The Carpathian Biosphere Reserve is one of the most representational and best preserved conservation areas of the Carpathian region. In its territory many species of endangered Carpathian flora and fauna of the region are sheltered. It is home to the world's largest primeval beech forest site with the participation of European forest, making it an essential part of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathian and Other Regions of Europe". The presence of reference mountain ecosystems (primeval forests) in the reserve makes it a protected area of great scientific interest to the environmentalists from all over the world. In particular, the experts from the Swiss Institute of Forestry, Snow and Landscape Investigations (WSL) have been researching CBR's forests for many years in cooperation with the scientists from the Carpathian Biosphere Reserve. CBR is also an excellent educational base for the students from different universities, including foreign ones. In particular, for more than 10 years, students of the University for Sustainable Development from the city of Eberswalde (Germany) have been coming on study tours the reserve. CBR is an important potential polygon for an international environmental monitoring network on our planet, which, unfortunately, is not yet used to this end. The inclusion of CBR as a national protected area into the territory of the UNESCO MAB Carpathian Biosphere Reserve will allow it to make a significant contribution to the sustainable development and rational use of natural resources in the Ukrainian Carpathian region.

2. Obtaining the status of a biosphere reserve, inclusion in the UNESCO World Network of Biosphere Reserves, inclusion of its beech primeval and ancient forests into the UNESCO World Heritage List as part of the "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe", extension of the territory of CBR with the aim to include the areas that are valuable in terms of conservation and scientific interest, organization of international cooperation with scientific and environmental institutions from the USA, Switzerland, Holland, Czech Republic, Slovakia, Germany, Poland, Hungary, Romania and other countries, establishment of a trilateral transboundary biosphere reserve "Eastern Carpathians". The following

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

*Yaroslav DOVHANYCH,  
Head of the Zoological  
Laboratory of CBR*

scientific works were published: 25 monographs, 18 volumes of proceedings of scientific conferences and more than 970 scientific papers. 15 PhD theses and dozens of student master works and case studies were prepared on the basis of the reserve. Preparation for establishing a transboundary Ukrainian-Romanian biosphere reserve "The Maramures Mountains" has started.

3. In order to increase the complexity of research and deep analysis of the monitoring results, a comprehensive database should be created for the input, processing and analysis of information on the status and functioning of the ecosystems of the reserve, which would allow to make a remote entry of observation data by all the employees of the reserve and by voluntary assistants.

The scientific activity of CBR should be organized in the form of projects with detailed substantiation of topics, with specification of the teams of performers, the means and funds needed to carry out the research, as well as the sources of funding.

Organize a mobile rapid-response team of well-equipped and trained rangers based at the central office of the reserve, which would protect the reserve in the most critical places and in the most critical time by organizing "surprise inspections".

To develop recreation and tourism on the territory of the reserve, it is a must to start working closely with the travel agencies of Ukraine.

Establish a Department for Sustainable Development which would deal with establishing the Carpathian Biosphere Reserve as UNESCO MAB protected area, and would further organize its cooperation with the communities within the reserve.



4. The advantages are few. One of them: nature conservation is a noble activity and the future generations will be grateful for it. Disadvantages: low educational level of the ranger service representatives (no special education is required), critically low salary (educated people will not go for it), poor social security for the rangers (with such legal protection and salary no one will risk their life and health), very poor equipping in terms of vehicles, weapons, special equipment to ensure effective protection of the territory of the reserve (webcams, trap cameras, night vision devices, etc.).

5. More than 120 scientific papers have been published. Future plans – to retire when I see that I don't make any positive contribution to the reserve.

6. When the secretaries of the Tiachiv District Committee of the Communist Party Mr. Dyshko and the secretary of the Zakarpattia Regional Committee of the Communist Party Mr. Chulei were arrested when poaching in the reserve; internships at the Institute for Ecological Systems Research (ESRI, Redlands, USA), the University of Massachusetts (UMAS, Springfield, USA) and the Federal Institute for Forestry, Snow and Landscape Investigations (WSL, Birmensdorf, Switzerland).



Endemic species or subspecies of birds: capercaillie, long-tailed owl and white-backed woodpecker are represented in the Carpathians by special mountain subspecies (respectively *Tetrao urogalus rudolfi*, *Strix uralensis macroura* and *Dendrocopos leucotos carpathicus*).

Small reservoirs with still water in the subalpine and forest zones are used by the endemic species of caudate amphibians for spawning, such as the Carpathian newt, which is found only in Carpathians, and the Danubian newt, which is a Carpathian-Balkan endemic. Among the species of fish that inhabit the reservoirs of the reserve there are also a number of endemic ones. Among them there are the endemics of the Danube basin: the Danube salmon, the Danubian gudgeon and the common zingel, as well as the endemic Carpathian subspecies of *Leuciscus souffia agassizi*. The endemic species of the cyclostomatous – Carpathian brook lamprey, which is endemic to the Tisza basin – is also found in the reservoirs of CBR.

In the Ukrainian Carpathians there are also many species of invertebrates, which are the Carpathian and Eastern Carpathian endemics, and all of them are distributed in the territory of the reserve.

In some karst caves, a unique fauna of invertebrates and troglobions is noted, among which there are a number of narrowly endemic species globally known only from the territory of the Ukrainian Carpathians. These include, in particular, the Transcarpathian duvalius beetle and *Colembola villemia* Vera.

There are rare insect species in the reserve with southern European connections: praying mantis, *Libelloides macaronius*, porphyrophora polonica, as well as some species of Hymenoptera and butterflies.

## RARE ANIMAL SPECIES

Specific attention and constant monitoring of number are required by the species of animals listed in the Red Book of Ukraine (2009), as well as those from the list of species of animals subject to special protection in the territory of Zakarpattia region (regional red list), the European Red List of endangered animals on the verge of extinction (1991), the International Union for the Conservation of Nature (IUCN Red list, 2009), lists and annexes of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention) (1979), Convention on the Conservation of Migratory Wild Animals (Bonn, 1979), Convention on International Trade in Endangered Species (Washington Convention) (1973), Agreement on the Conservation of Afro-Eurasian Wetland Birds (1996).

In total, 115 species of animals have been found on the territory of the reserve, which are included in the Red Book of Ukraine (this is 80% of the rare species of all Carpathians). Apart from that, 124 species of animals of the reserve are listed in the Red Book of the Carpathians, 196 – in the Annex to the Berne Convention, 20 – in the Annex to the Bonn Convention, 2 species – in the Annex to the Washington Convention (CITES), 22 species – in the European Red List.

Here is what the species composition of the rare animals of the reserve looks like by separate systematic groups.

**Mammals.** Almost half of the mammal species that inhabit the Carpathian Biosphere Reserve (32 species out of 67) are listed in the Red Book of Ukraine. This means that they are under certain threat throughout Ukraine and require special attention from environmental authorities. Most of the "red-listed" mammal species belong to Chiroptera (23 species). The second largest group of species found in the Red Book of Ukraine is predators (7 species). They are brown bear, otter, European mink, ermine, forest ferret and Eurasian lynx. Among the rodents in the fauna of the reserve 3 species are found in the Red Book of Ukraine (Tatra vole, snow vole and birch mouse), from the insectivorous – 2 species (alpine shrew and water shrew). Eight mammal species of Ukraine are listed in the European Red List of Endangered Species of Animals and Plants. They are wolf, hazel dormouse, otter, brown bear, Eurasian lynx, bats: greater mouse-eared bat, Natterer's bat, and brown long-eared bat. 38 mammal species are listed in Annexes 2 and 3 of the Berne Convention. These are mostly endangered and vulnerable migratory species whose conservation requires the cooperation of several countries. Among them there are brown bear, wolf, lynx, 23 species of bats and some other species. The Carpathian Biosphere Reserve also houses 21 species of mammals listed in Annex 2 of the Bonn Convention on the Conservation of Migratory Species of Wild Animals. These are exceptionally



Bat researcher Vasyl POKYNCHEREDA near the karst cave "Druzhba" (Friendship), the village of Mala Uholka, Tiachiv district, Zakarpattia region



**Leading Engineer of CBR Zoological Laboratory Yuriy POPOVYCH during beavers habitat inspection on the Bila Tisza River (Luhv, Zakarpattia region)**

bats. 16 species of mammal fauna of the reserve are included in the regional Red List of Species Under Special Protection in the Ukrainian Carpathians. Among them there are rodents and several species of bats. There is also the Red List of the International Union for the Conservation of Nature (IUCN). In the Carpathian Biosphere Reserve there are 34 species of mammals from this list.

**Birds.** The avifauna of the reserve is well represented in the conservation lists of various rank: out of 193 bird species 34 are listed in the Red Book of Ukraine, 14 – in the IUCN Red List with the categories VU, NT LC, and 3 – in the European Red List, 183 – in the Annexes to the Berne Convention, 63 to Annex 2 of the Bonn Convention; 33 to Annexes to the Washington Convention (CITES);).

About 10% of the breeding populations of the Ukrainian Carpathians, such "red-listed" species as lesser spotted eagle, golden eagle, peregrine, grouse, western capercaillie, stock dove, eagle-owls, boreal owl, Eurasian pygmy owl, white-tailed hawk, white-backed woodpecker, common rock thrush and about 25% of breeding population of alpine accentor are protected in the reserve.

**Reptiles.** All representatives of the herpetofauna of the reserve are subject to protection both nationally and internationally. Three species are listed in the Red Book of Ukraine (2009): European

green lizard, Aesculapian snake, smooth snake. Others are listed in the IUCN Red List and Annexes to the Berne Convention.

**Amphibians.** Absolutely all the amphibians that inhabit the Carpathian Biosphere Reserve are listed in the International Union for Conservation of Nature (IUCN) Red List. Except for the Danube newt, which has the status of a close to endangered species, all others belong to relatively safe species. In addition, 6 species of amphibians are listed in the Red Book of Ukraine, namely, fire salamander, Carpathian, Alpine and Danube newts, mountain yellow-bellied toad have the "vulnerable species" status, and agile frog – "endangered species". 13 species are also included in the annexes to the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention). 5 species are found in the Annex 3 – the category "Species under protection", and 7 species are found in the Annex 2 – "Species under special protection".

**Fishes and cyclostomatous.** All the representatives of fish fauna of the reserve, with the exception of rainbow trout, are included in various conservation lists and annexes to a number of environmental conventions. The Red Book of Ukraine includes 1 species of Cyclostomata (Carpathian brook lamprey) and 7 representatives of fish: Danube salmon, European grayling, crucian carp, common barbel, European souffia, common zingel and freshwater ling. The Danube salmon and common zingel are included in the European Red List. The annexes of the Berne Convention include 12 representatives of the fauna of the reserve. All species of the reserve are listed in the IUCN Red List.

**Invertebrates.** There are 59 invertebrate species observed in the Carpathian Biosphere Reserve as of 2018, which are listed in various conservation lists of different ranks: the International Red List (IUCN) – 15, the European Red List (ESF) – 16, the Berne Convention Annexes – 10 and to the Red Book of Ukraine (RBU) – 46.

## ZOOLOGICAL RESEARCH OBJECTIVES AT CBR

The main objective of the CBR's Zoological Laboratory is the development of animal management methods on the reserve's and adjacent territories. The elements of this work are: to study the distribution, number and features of biology of rare and endangered species

of animals, mapping their locations, setting up environmental monitoring of their populations, developing measures aimed at the reproduction, maintenance and conservation of zoological complexes within different functional zones of the reserve, designing a digital zoological database. Important areas of zoological research conducted today by the Zoological Laboratory of CBR are the study of the status and dynamics of populations of the species of animals that play a key role in ecosystems (flagship species, indicator species), as well as rare species whose number within the range of their habitats is declining due to anthropogenic pressure. The main focus is on groups of animals such as mammals (large predators, ungulates, bats), birds (Galliformes, owls, birds of prey), amphibians (caudal amphibians), some groups of insects (Lepidoptera: Hesperioidea and Papilionoidea, Parasitica, bark beetles). Selection of research objects is largely determined by the availability of specialists in the staff of the scientific department of CBR.

An in-depth study of large carnivorous mammal's population is planned. These are animals that need large areas of wilderness, which is why conservation within the reserve cannot ensure their conservation in the region in general. A specific problem that the reserve is planning to address in the nearest future is the conservation and reproduction of the European mink population. This measure is planned to be carried out in cooperation with foreign specialists.

Particular attention will be paid to cheiropterous animals by the zoologists of the reserve, due to the considerable diversity of the local bat fauna – 23 species, and the presence of the largest hibernation localities for bats in Ukraine within the protected area. The winter colonies of these animals have been monitored here for about 30 years.

There are also plans to reintroduce species of animals that once disappeared from the territory of the reserve, but suitable living conditions have remained. Such species, in particular, include chamois, mountain marmot, mountain apollo butterfly.

**East-Carpathian rhododendron in blossom on Pip-Ivan of Maramures Mt.; primeval spruce forests (upper tree line) in the Maramures protected massif**



# Зелені Карпати

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# HISTORY, ACHIEVEMENTS AND PROSPECTS OF BOTANICAL RESEARCH

## IN THE CARPATHIAN BIOSPHERE RESERVE

**Mykola VOLOSHCHUK,**  
*Head of the Botanical  
Laboratory of CBR,  
PhD (Biological Sciences),  
Tetiana ANTOSIAK,  
Alla KOZURAK,*  
*senior researchers*

The first scientific research dedicated to the floristic study of the Ukrainian Carpathians' mountain massifs were held over a century ago. Unique materials are published by L. Wagner, G. Zapalovych, F. Paks, S. Yavorka, I. Kliasherskyi, K. Domin, A. Margitay, F. Gerbich and others. Much of the research is devoted to the protection of particularly valuable sites of the Chornohora and Polonyny mountain ridges. Famous Czech botanists A. Zlatnik, A. Giltzer seek the extension of the Hoverla Reserve in the Chornohora mountain massif and substantiate the creation of reserves in the beech forests of the Luzhanka river basin and the beech-spruce-fir forests of Pip-Ivan of Maramures Mt. A study of the flora and vegetation of Pip-Ivan of Maramures Mt. is the subject of a monograph by a Czech botanist M. Deil. By his research in 1926-1936 Alois Zlatnik scientifically substantiated the need to preserve primeval beech forests of the southern slopes of the Krasna mountain range, which nowadays are part of the Shyrokyi-Luh massif of the reserve. Data on the flora and vegetation of the Svydovets mountain range are found in works published at the end of the XIX – beginning of the XX centuries, in particular those by H. Zapalovych and F. Paks, K. Domin, and H. Kral.

**Crocus heuffelianus of  
Menchul Mt.; mountain stream  
(Chornohora field division)**



**Alla KOZURAK, Tetiana ANTOSIAK and Mykola VOLOSHCHUK  
in the Chornohora protected massif**

After the accession of Western Ukrainian lands to the Ukrainian SSR, a period of more systematic and intensive study of the Ukrainian Carpathian flora started. At that time, a number of botanists from leading scientific institutions were working there, among them P.D. Yaroshenko, M.H. Popov, S.S. Kharkevych, S.M. Stoiko, V.I. Komendar, S.S. Fodor and others. According to the results of the studies, especially valuable sites of the Chornohora and Uholka massifs of the Ukrainian Carpathians became the basis for establishing the Carpathian State Reserve in 1968, covering an area of 12 672 ha, on the territory of the Ivano-Frankivsk and Zakarpattia regions.

Purposeful and systematic botanical studies of protected areas began in the mid-1970s. The flora and vegetation of the Carpathian Nature Reserve were

studied by the following researchers: V.I. Vainahiy, D.D. Sukharyuk, V.I. Kudrych, by the employees of the Institute of Botany named after Kholodnyi (Lviv Branch), the Department of Botany of the Uzhgorod University and by other specialists. In particular, the employees of the Institute of Botany – Yo.V. Tsaryk and Yu.I. Kobiv – started to study Rumex growing sites at the Chornohora massif, and I.L. Novrotska initiated the research of lichens of the Chornohora and Hoverla forestry districts. Researchers of the Uzhgorod University under the supervision of V.I. Komendar examined the composition and structure of shrubs and herbaceous communities and the biology of their components. Employees of the reserve – V.I. Vainahiy, H.H. Lazutkin – studied the meadow vegetation, its species composition, structure and ecology of the main components. According to the

literature sources, in 1976 by scientists of the Carpathian Reserve the first list of higher vascular plants flora was compiled, which included 693 species belonging to 80 families and 305 genera, and based on the literature data – a list of Carpathian endemics growing on the territory of the reserve. Of the 77 endemics that occur in the highlands of the Ukrainian Carpathians, 51 species have been recorded in this protected area.

Thanks to the efforts of I.V. Vainahiy, CBR herbarium has been established in 1974, which now houses more than 10,000 herbarium sheets. Since 2011, it is represented in the National Herbarium List of Ukraine by the Index Herbariorum Ucrainicum under the acronym of "CBR". Dr. Vainahiy's publications on the distribution of some rare plant species and their seed productivity appear in literary sources.

In the 1980s, the territory of the Carpathian Reserve changed. New territories were added to its spatial structure, including Shyrokyi Luh and Narcissi Valley protected massifs. The flora and vegetation of the reserve was then studied by the following team members: Dmytro Sukharyuk, Vasyl Antosiak, Vasyl Kudrych. Taking into account territorial changes, in 1982 a popular-science publication "The Carpathian Reserve" and

the monograph "Flora and Vegetation of the Carpathian Reserve" were published, which summarized the results of many researchers. The list of flora of the Uholka-Shyrokyi Luh massif was presented in the PhD thesis of L.O. Tassenkevych. According to her, 483 species were found in the Uholka massif, and 372 – in the Shyrokyi Luh mountain range. Also in 1983 an agreement on scientific cooperation with the All-Union Institute of Medicinal Plants (AUIMP) was signed, for inventory of the reserve's flora under the guidance of Prof. O.I. Schröter (AUIMP) and D.D. Sukharyuk (CBR). Main performers were O.P. Efremov (AUIMP) and junior scientist V.M. Antosiak (CBR), who conducted a detailed floristic study of the entire protected area. According to the results of this inventory, the scientific paper of O.P. Efremov, D.D. Sukharyuk and V.M. Antosiak "Flora of the Carpathian Reserve (vascular plants)" was published, in which there were already 899 vascular plants indicated for the territory of the reserve, including for the Uholka massif – 633, Shyrokyi Luh – 506, Chornohora – 443 and Narcissi Valley – 446 species. The biogeography laboratory of the Institute of Geography of the USSR Academy of Sciences organized a comprehensive study of forest ecosystems under the program of geosystem monitoring in the Uholka

and Chornohora forests. Scientists of the Botanical Garden of the Lviv University under the guidance of R.V. Karmazin developed a master plan to design an arboretum including provision of the necessary facilities on the territory of the central office of the reserve on an area of 11 hectares; planting material was arranged by them as well. Also a botanical collection site for rare species of natural flora and exotic plants was designed, where 15 rare forest species were planted and phenological observations were initiated. A representative of the Department of Botany of the Uzhgorod National University Dr. Vasyl Krychfalushiy studied the distribution, ecological and biological features and measures for protection of narcissus species in the Narcissi Valley. Information about the flora of the reserve is also presented in numerous works by I.V. Vainahiy, D.D. Sukharyuk, S.S. Stoiko, K.A. Malynovskyi, I.L. Milkina, L.A. Tassenkevych, M.P. Slobodian, V.I. Komendar, V.V. Krychfalushiy, O.P. Efremov. The PhD theses of L.A. Tassenkevych on the theme "Flora and Vegetation of the Uholka Shyrokyi Luh Protected Complex" and O.P. Efremov "Flora of the Carpathian Reserve" were prepared and defended. Since 1986, the yield of raspberries and blueberries has been studied in the Chornohora massif. In 1984, the work began on the topic "Rumex alpinus in Transcarpathia" aimed at the development of agrotechnical measures for the reclamation of Rumex alpinus thickets on Bretskul alpine meadow (Chornohora massif). Since 1987, work has been undertaken jointly with AUIMP to investigate the possibility of using Rumex alpinus rootstock as medicinal raw material. In the late 80's a complex of works on creation of artificial populations of Gentiana lutea in Zakarpattia was carried out (contract with the Tbilisi Medical University).

The fungi of the reserve were investigated by V.P. Helyuta. He prepared a list of fungi of the Chornohora and Shyrokyi Luh massifs by altitude profile. Bryophytes were studied by the biologists of the Institute of Botany of the NAS of Ukraine in the 70's and 80's of the last century. They surveyed mainly the territory of the Chornohora and Uholka-Shyrokyi Luh massifs.

In the 1990s, thanks to the next stage of expansion, two new massifs were included into the reserve: Maramures and Kuziy, and also the territory of the existing



Scientists of CBR's Botanical Laboratory during a field trip to the dendrological park with schoolchildren

1. Throughout the 50-year history of the institution, scientists at the Botanical Laboratory, working at CBR, have been exploring the flora and vegetation in its protected massifs. Numerous monographs and scientific works have been published. In particular, in 1997 a monograph entitled "Biodiversity of the Carpathian Biosphere Reserve" was published, summarizing the results of many years of research of the flora of vascular plants, mosses, lichens, algae and presented information collected on the cenotic diversity of the reserve's massifs. This work is one of the main scientific achievements of CBR's scientists.

A number of dissertations were defended, and in 2012 a monograph entitled "Phytodiversity of Nature Reserves and National Parks of Ukraine" was published, which included a section on the features of the vegetation cover of the Carpathian Biosphere Reserve. In 2014, the monograph by S.M. Zyman, F.D. Hamor, O.V. Bulakh, M.I. Voloshchuk "Narcissus jonquilla L. in the Ukrainian Carpathian Mountains" was published.

The outcome of the work is the designed database of flora of the Carpathian Biosphere Reserve, which includes 4114 species of higher, lower plants and fungi. The number of vascular plants consists of 1342 species, of which angiosperms – 1286 species, gymnosperms – 11, ferns – 32, Equisetophyta – 8, and Lycopodiophyta – 5 species. Bryophytes include 525 species, lichens – 806, algae – 437 and fungi – 1004 species.

194 species of plants and fungi are included in the Red Book of Ukraine, 143 species are listed in the Regional Red List, as well as 74 endemic species are protected here.

The research activities are being conducted to study the structure of populations of individual rare species included in the Red Book of Ukraine: *Rhodiola rosea* L., *Dryas octopetala* L., *Loiseleuria procumbens* (L.) Loisel., *Salix herbacea* L., *Leontopodium alpinum* Sass., *Narcissus angustifolius* Curt., *Allium ursinum* L., *Leucojum vernum* L. and others; special action plans for their conservation have been prepared.

The programs for conservation of the unique natural object – the Narcissi

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

**Mykola VOLOSHCHUK,**  
*Head of the Botanical  
Laboratory of CBR*

Valley – as a wetland of international importance and a Program to study structure and dynamics of meadow ecosystems of CBR with an aim to optimize traditional nature resource management.

There have been organized observations on distribution of invasive plant species, first and foremost *Heracleum sosnowskyi* Manden., *Reynoutria sachalinensis* (F. Schmidt) Nakai), *Ambrosia artemisiifolia* L., and a program is approved as for the methods of combating alien plant species in CBR and the adjacent territories.

Particular attention is paid to the protected tracts, which shelter large concentration of rare plant species, the so-called "hot spots", including: Valley of Narcissi, mountain peaks of the Blyznytisia, Petros, Hoverla, Pip-Ivan of Maramures, Chorna and Yulivska Mountains, the Falcon Rocks and the Karst Arch. Flora of the oldgrowth and primeval forests, which have been included in the UNESCO World Heritage List in 2007, is being investigated. Research has been conducted on flora of the wetlands that are prepared to be included in the Ramsar List. Work is underway to study the meadow ecosystems of the reserve.

Articles, scientific works and monographs are published annually. The current knowledge of the flora and rare species is based on the vast experience accumulated by the aforementioned researchers.

3. In my opinion, new areas of work for the laboratory should be the research of habitats distribution within the territory of the reserve, which are described by the EU-NIS international classification. To establish a nursery for rare species of

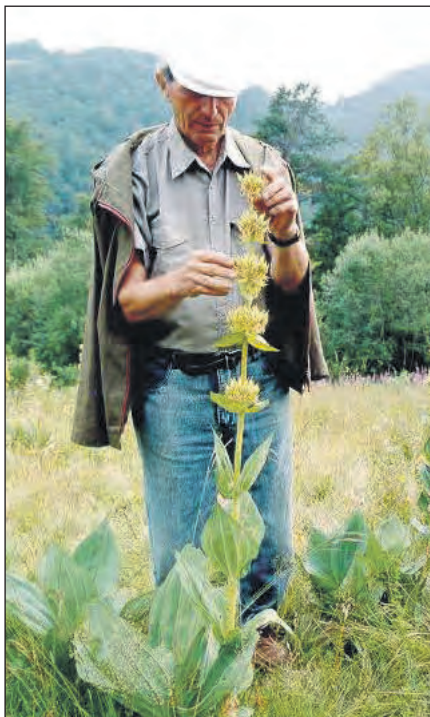


plants that are on the verge of extinction, also to organize their cultivation and subsequent reintroduction. To start cooperation with other leading environmental institutions, especially the international ones.

4. The mission of every conservationist is extremely honorable, especially in the face of increasing anthropogenic pressure. Conservation of nature in all countries of the world is a prestigious and highly paid work. Recently, however, due to the low salaries paid to the conservationist in our country, a loss of personnel has taken place, and young professionals often leave to find better paid jobs.

5. The results of my own research are published in 6 monographs (in co-authorship), 75 scientific works, numerous popular scientific articles, etc. One of the results of the 10-year research was the defense of the dissertation for the degree of Candidate of Biological Sciences (PhD) in the field of botany – in 2012 – at the M. Kholodnyi Institute of Botany of the National Academy of Sciences of Ukraine.





**PhD, botanist Mykhailo BEDEI studies great yellow gentian in Chornohora mountain massif (2008); studying early spring flora in the Piddil tract (Kuziy-Trybushany protected massif)**



Chornohora and Uholka-Shyrokyi Luh massifs was enlarged. In the same year, the Regional Landscape Park "Stuzhytsia" was included into the Carpathian Reserve. The flora and vegetation of the reserve was studied by the researchers V.M. Antosiak, T.M. Antosiak, V.I. Vainahiy. In particular, I.A. Makhanets and V.M. Antosiak studied the structure and dynamics of meadow ecosystems of the reserve and adjacent areas. The studies covered phytocenoses of the Narcissi Valley and Shyrokyi Luh field divisions, as well as the sub-alpine meadows on the slopes of the Petros, Hoverla, and Rohnieska massifs. T.M. Antosiak was responsible for the research topic dedicated to rare plant species of the reserve and surrounding areas. Researchers from the Institute of Botany and the Institute of Ecology of the Carpathians continued to work on the inventory of fungi, lichens and algae.

In 1997, a monograph was published under the title "Biodiversity of the Carpathian Biosphere Reserve", which summarized the results of many years of research into the flora of vascular plants, mosses, lichens, algae and collected information on the cenotic diversity of

protected massifs. This work is one of the main achievements of scientists of the reserve and other leading scientific institutions, which can be considered as the second inventory of the vascular plants flora.

The territorial changes of the reserve also determined the changes of the overall floristic list, which increased from 693 species in 1976 to 1062 species in 1996. In the late 90's of the twentieth century CBR has undergone significant expansion of its territory. On the basis of the Svydovets Landscape Reserve of the national significance and the Botanical Nature Monument of the national significance "Blyznytisia Rocks" a new protected high-mountain Svydovets protected massif was established, and the Chornohora, Maramures and Kuziy massifs were significantly expanded, as well as two protected sites of national importance were included into the Reserve – Chorna Hora and Yulivska Hora. Especially unique in the floristic terms among the new territories were the Blyznytisia Rocks and localities of the stepped and rocky phytocenoses on the slopes of the Chorna Hora and Yulivska Hora Mts. In connection with the expansion

of protected area, the employees of the Department of Botany of the Uzhgorod National University, in particular M.I. Bedei, V.I. Komendar, R.Ya. Kish, M.M. Kivedzhi, who conducted an inventory of the Chorna Hora and Yulivska Hora Mts. flora. M. Bedei studied the influence of anthropogenic factors on the phytocenoses of the Maramures massif.

Since 2000 M.I. Bedei, S.M. Zyman, I.A. Makhanets, M.I. Voloshchuk, T.M. Antosiak, A.F. Hamor, A.V. Kozurak have been studying flora and vegetation of the reserve. New publications were made by the researchers, namely: M.I. Bedei, S.M. Zyman, D.D. Sukharyuk, I.A. Makhanets. In particular, the monographs of M.I. Bedei "Blyznytisia-Drahobrat (flora, vegetation, protection)", M.I. Bedei et al "Great yellow gentian (*Gentiana lutea* L.) in the Ukrainian Carpathians." The PhD dissertation of A.F. Hamor on the topic "*Cerasus avium* (L.) Moench in the Ukrainian Carpathians: Morphological and biological features, and its distribution".

In 2005-2007, S.V. Postoialkin under the supervision of O.E. Khodosovtsev conducted an additional inventory of

the species composition of lichens in the Uholka protected massif, the results of which became part of the PhD dissertation of O.E. Khodosovtsev. N. Chepelevska and M.V. Pirogov studied the lichens of the Chornohora massif; L. Dimitrova, O. Nadeina studied the lichen flora of beech primeval forests of the Uholka-Shyrokyi Luh massif.

In 2010, after the next expansion, the area of the reserve was enlarged up to 58035.8 hectares, 39485.8 hectares of which came to be in the permanent use by the reserve, and 18550 hectares – used by other land users. Significant changes occurred in the floristic composition of CBR. The study of flora and vegetation is carried out by M.I. Voloshchuk, T.M. Antosiak, A.V. Kozurak. During this period the PhD theses were defended by: B.I. Moskalyuk "The current state of populations of high mountain species of the genus *Gentiana* L. and scientific bases of their protection in the Ukrainian Carpathians", M.I. Voloshchuk "*Rhododendron myrtifolium* Schott et Kotschy in the Ukrainian Carpathians: Eco-coenotic, population, morphological and biological features and trends of its dynamics". In 2014, the monograph by S.M. Zyman, F.D. Hamor, O.V. Bulakh, M.I. Voloshchuk "*Narcissus angustifolius* in the Ukrainian Carpathians". In 2012 – "Phytodiversity of nature reserves and national parks of Ukraine" was published.

The research activities are being conducted to study the structure of populations of individual rare species included in the Red Book of Ukraine: *Rhodiola rosea* L., *Dryas octopetala* L., *Loiseleuria procumbens* (L.) Loisel., *Salix herbacea* L., *Leontopodium alpinum* Sass., *Narcissus angustifolius* Curt., *Allium ursinum* L., *Leucopodium vernum* L. and others; special action plans for their conservation have been prepared.

The programs for conservation of the unique natural object – the Narcissi Valley – as a wetland of international importance, and a Program to study structure and dynamics of meadow ecosystems of CBR with an aim to optimize traditional nature resource management.

There have been organized observations on distribution of invasive plant species, first and foremost *Heracleum sosnowskyi* Manden., *Reynoutria sachalinensis* (F.Schmidt) Nakai, *Ambrosia artemisiifolia* L., and a program is approved as for the methods of combating alien plant species in CBR and the adjacent territories.

Particular attention is paid to the protected tracts, which shelter large concentration of rare plant species, the so-called "hot spots", including: Valley of Narcissi, mountain peaks of the Blyznytzia, Petros, Hoverla, Pip-Ivan of Maramures, Chorna and Yulivska Mountains, the Falcon Rocks and the Karst Arch. Flora of the oldgrowth and primeval forests, which have been included in the UNESCO World Heritage List in 2007, is being investigated. Research has been conducted on flora of the wetlands that are prepared to be included in the Ramsar List. Work is underway to study the meadow ecosystems of the reserve.

At present, 4114 species of plants and fungi have been registered in the territory of CBR, of which 1341 species are vascular: angiosperm – 1282 species, gymnosperms – 35, Equisetopsida – 8 and Lycopodiophyta – 5. Flora of mosses has 525 species, lichens – 806, algae – 437 species. Fungi – 1004 species. The richest in floristic diversity is in the Uholka-Shyrokyi Luh, Kuziy-Trybushany, and Chornohora massifs.

A rare component of biodiversity, which includes rare and endemic species of flora and fauna, is of particular interest and value. 208 rare species of plants and fungi listed into the Red Book of Ukraine have been found in the territory of CBR, including 147 species of higher vascular plants, 9 species of non-vascular (mosses), 24 species of lichens and 20 species of

fungi. The rarest species are found in the Chornohora (80), Svydovets (61) and Maramures (52) massifs.

Researchers of the botanical laboratory continue to work in the arboretum and botanical collection plot in the central office. Today, there are about 300 species of vascular plants of natural flora and exotic species in the arboretum. 128 species of trees and shrubs are grown here, 37 of which are natural flora and 91 are exotic. In 2009, a nursery of rare and ornamental species was created, where about 70 species of trees and shrubs are now grown. During the period of the nursery of decorative and rare species creation, many useful works were done, in particular, dozens of events were carried out on landscaping and maintenance in the field division offices of the reserve, schools and kindergartens not only in Rakhiv, but also in Rakhiv district of Zakarpattia region. In total, more than 550 seedlings have been used for landscaping over five years. More than 200 seedlings have also been given for territory arrangement of the field divisions' offices of the reserve.

Scientific articles are published annually, especially current knowledge of flora and rare species are highlighted based on the vast amount of research mentioned above.

**At the highland lake Johanna in the Maramures Mountain Massif**



# HISTORY, STATUS AND PERSPECTIVES OF FOREST ECOSYSTEM RESEARCH

## IN THE CARPATHIAN BIOSPHERE RESERVE

Mountain forest research in Zakarpattia region, including those from the territory of the Reserve, started back in the 19<sup>th</sup> century. In particular, forest vegetation was studied by H. Zapalovych, F. Paks and other researchers. In the early 20<sup>th</sup> century forest research became more intensive, with significant contributions from L. Fekete, K. Domin, J. Vincent, P. Kontney, A. Zlatnik, M. Dale, and others. In the 30s of the last century, the Czech scientist A. Zlatnik laid 7 sample plots in spruce and beech forests in the Maramures Mts. on the slopes of Pip-Ivan. (During 2008-2010, the Zlatnik's research sites were restored and repeated measurements were carried out on the Lysychi tract of the Maramures mountain massif of CBR by a team of scientists from the Mendel University of Agriculture and Forestry (Brno, Czech Republic). On the initiative of Professor Zlatnik, in order to preserve the primeval forests, a number of nature conservation areas and sites were created – in the Maramures mountain massif, also on the southern slope of Hoverla Mt., in the basin of the Luzhanka river, in Stuzhytsia massif, on Yavirnyk Mt. etc. These relatively small reserves have become the basis of modern protected areas – the Carpathian Biosphere Reserve and the Uzhanskyi National Nature Park.

In the Soviet period, the study of the forests of the present territory of CBR continued and deepened. In particular, changes in vegetation were investigated by P.D. Yaroshenko and V.A. Hrabar; beech forests were studied by P.I. Molotkov, S.M. Stoiko, V.I. Parpan; oak forests – by S.M. Stoiko, L.I. Milkin; dark coniferous forests – M.A. Holubets and L.I. Milkin; crooked woodland – V.I. Komendar and O.V. Chubatyi and many more. Positive role in the development of mountain forest ecosystems research was played by designation of the Carpathian Reserve,



**Myroslav KABAL,**  
*Head of the Forest Research  
Laboratory of CBR*

and establishment of an appropriate infrastructure on its basis for field work and organizing scientific and technical staff teams. Among the employees of the reserve, who at different times were engaged in the forest research activities and made a special contribution to it, are: D.D. Sukharyuk, D.S. Saik, M.V. Kostyk, R.V. Rybchak, L.L. Zakharchyshyn, I.Ya. Polianchuk and others, forest soils were investigated by Yosyp Bundziak.

During 1978-1980, scientists of the Carpathian Branch of the Ukrainian Institute of Forestry and Agroforestry, together with the staff of the reserve, laid a number of sample plots in pure and mixed spruce forests, as well as in artificial forest stands in the tract Bilyi under Hoverla Mt. (scientific supervisor – A.I. Pitikin).

During the last decades a considerable attention has been devoted to the structure of beech primeval forests, in particular their structure has been studied by V.I. Parpan and S.M. Stoiko, dynamics of phases and stages of development – by M.V. Cherniavskiy. An important step in the development of the forest ecosystems research of the Carpathian



**Dmytro SUKHARYUK,**  
*Senior Researcher,  
PhD in Biological Sciences*

Biosphere Reserve was establishing cooperation with the Swiss Federal Institute for Forestry, Snow and Landscape Investigations (WSL). For example, in 2000, a 10-hectare permanent sample plot was laid by WSL, the Institute of Mountain Forestry (Lviv, Ukraine), and the Carpathian Biosphere Reserve in the beech primeval forests of the Uholka field division of CBR. Now it serves as a training ground not only for studying the composition, structure and dynamics of the beech forest stand's development, but also for the researchers involved in the study of other components of forest ecosystems: myco-flora, lichen-flora, entomofauna, etc. So far, 4 inventories of the forest stand and undergrowth have been conducted (2001, 2005, 2010, and 2015). Joint studies of beech primeval forests and data from detailed inventories, descriptions and mapping of forest areas by CBR staff made it possible to prepare a high-quality nomination application for the Carpathian Beech Primeval Forests as a natural Property, which was included into the UNESCO World Heritage List in 2007.



During 2006-2007, in the framework of the Ukrainian-Dutch project (BBI-Matra), an inventory and mapping of primeval forests of Rakhiv, Tiachiv and Khust districts of Transcarpathia were carried out by CBR team, the results of which gave impetus for the development of the nowadays' popular conservation trend of primeval and natural forests protection and inventory. During 2009-2010, a large-scale inventory of the primeval beech forest of the Uholka-Shyrokyi Luh massif was carried out jointly by the employees of WSL, the National Forestry University of Ukraine (NFUU) and CBR, during which a network of more than 300 sites was established. In 2012-2015, a research was started by the employees of the forest research laboratory of CBR together with the staff of the NFUU involving establishment of permanent sample plots in the beech primeval forests within the upper forest line and beech forest sites situated near river channels. During 2012-2017, a series of scientific polygons in natural mountain spruce forest stands were created by the team of CBR forest research laboratory in the tracts of Syrylivka (Chornohora massif) and Lysychyi (Maramures massif).

In addition to the primeval forests investigations, an important direction of forest research in CBR is the study of artificial spruce forests structure and the succession processes in them, as well as the development of methods for renaturalization of natural ecosystems. For this purpose, in 2005-2006, a permanent research plot for spruce monocultures transformation was established in the Chornohora division of CBR with the help of the team member of WSL, NFUU and CBR. It's a network of 12 plots 1 ha each; 3 of them are control plots, and on 9 of them logging operations were carried out with different intensity. In 2012 and 2018, the 2<sup>nd</sup> and 3<sup>rd</sup> inventories were carried out on the sample plots, the results of which showed a positive dynamics of succession towards formation of future forest stands that are close to natural beech-spruce-fir communities in their composition and structure.

In order to study the status of populations, rare tree species included in the Red Book of Ukraine, and to develop a system of measures for their reproduction, in 2013 works were started on the research of the yew-tree population within CBR and adjacent territories, and in 2017 – for the Stone pine. However, despite the fact that the relevant work programs were developed by the laboratory staff and

agreed at the meeting of the Scientific and Technical Council of CBR, their direct implementation is difficult to be started because of a complex and bureaucratic system of permits and limits for the use of natural resources, even for scientific and environmental purposes.

In addition to the studies of forest structure on permanent scientific plots, the forest science laboratory regularly collects information on forest massifs of CBR. In particular, since 2001, the flowering and yield of the main forest-forming species of CBR according to the Kapper's scale have been evaluated. Since 2009, the collection of information on forest pests and diseases distribution, forest drying-out centers, wind-thrown areas and windbreak processes in the forests, as well as the state of natural regeneration at model forest plots in the core zone and the areas where sanitation activities were held.

In the future, the forest research laboratory of CBR plans to deepen and expand scientific cooperation with research institutions of Ukraine and from abroad, which will allow attracting highly qualified specialists to the forest ecosystem research activities, as well as to use the latest methodologies and equipment. Among the priority areas is the research of the composition and structure of primeval forests, the features of the natural processes occurrence in them, and the study of individual components of primeval forest ecosystems. For this purpose it is planned to expand the network of permanent scientific sample plots not only in beech primeval forests, but also in mixed beech-fir-spruce and pure mountain

spruce pristine forests. The problem of the weakening and degradation of spruce monocultures (droughts, windstorms, etc.) has been extremely acute for the forest ecosystems of CBR in recent years, so the issue of not only combating the effects of negative phenomena, but also the development and implementation of measures to prevent them, in particular by transforming artificial tree stands into close-to-nature forests will continue to be relevant and important in the scientific and conservation activities of the reserve. In addition, it is planned to set up works aimed at conservation and reproduction of stands with aboriginal forms of rare species listed in the Red Book of Ukraine – yew and stone pine. Experimental-research forest sample plots, both in primeval forests and in artificial forests, were established, which in addition to the scientific function, should also serve as demonstration sites for the conservation, reproduction and sustainable use of forest resources in the Ukrainian Carpathians. In order to establish a system of regular observations, evaluation and analysis of the information on the status of CBR forests and for predictive modeling of its changes with the aim to provide analytical and information support to decision-making on sustainable forest management, it is necessary to launch forest ecosystem monitoring using ICP-Forest software. However, such important and labour-intensive tasks can be accomplished only if the staff number of researcher departments is enlarged, and the logistical provision of the forest research laboratory is strengthened.



**Assistant Professor of the National Forestry University of Ukraine (Lviv) Mykola CHERNIAVSKYI and Dmytro SUKHARYUK while laying sample plots in beech forest stands of the Uholka-Shyrokyi Luh Massif**

## GUARDING NATURAL VALUES

### RANGER SERVICE OF THE CARPATHIAN BIOSPHERE RESERVE



**Mykhailo PROTS,**  
**Head of the Department**

Protection of the territory of the reserve is the responsibility of the state conservation department – ranger service of a protected area – according to the Decree of the Cabinet of Ministers of Ukraine dated on July 14, 2000 Nr. 1127 "On the state conservation service in protected areas of Ukraine". The main objectives of this service are:

- ensuring compliance with the regime of protection in the territory of protected areas in Ukraine;
- prevention and cessation of violations of environmental legislation.

Today, the total area of the reserve is 58035.8 hectares, of which 31977 hectares are in the direct use by the reserve, 7508.8 hectares are transferred to CBR for protection and conducting priority nature conservation measures, and another 18550 hectares of the territory are not removed from other land-users. The territory of the reserve is distributed between isolated massifs in Rakhiv, Tiachiv, Khust, Vynohradiv districts of Zakarpattia region and is divided into 11 field divisions – in Ukraine they are called "nature conservation and research units" – Chornohora division, Bohdan-Petroske, Trybushany, Keveliv, Petros-

Hoverlianske, Maramures, Rakhiv-Berlybaske, Kisva field division, Uholka-Shyrokyi Luh, the Narcissi Valley named in honour of Prof. Vasyl Komendar.

The breakdown of CBR's territory by field divisions and land categories is given in the table.

The number of the ranger service's employees is 150 people. Head of the Ranger Service here is the Director of the Reserve, also there is a position of the Deputy Director – Chief Conservationist of the Reserve, and there operates the Department of State Nature Conservancy of the reserve. The Administration of CBR has developed the Instruction on pass control and protection regime on the territory of the Carpathian Biosphere Reserve, which is approved by the director. There are 11 managers of field divisions, 10 deputy managers of field divisions, 22 nature protection foremen and 100 inspectors nature conservation. The territory of every field division is divided into ranger districts and sub-districts. The average area of one ranger district is 395 hectares.

The protection of the territory is carried out in a combined manner, namely:

- daily patrolling of the territory by strictly defined trails is carried out;
- daily duty at checkpoints is carried out by the rangers, and round-the-clock duty is established during the fire-hazardous period;
- ad-hoc inspections are conducted periodically to verify compliance with the regime;
- during summer period, rangers carry their duty at the high-altitude checkpoints "Saddle under Hoverla Mt. in the Chornohora massif and the checkpoint "Lysychyi" in the Maramures massif;
- during the fire-hazardous period fire guards are involved – one guard for each field division;
- during the flowering of *Narcissus angustifolius* and mass visitation in the field division "Narcissi Valley" (in May) the protection is intensified;
- during the reindeer rutting season and brown trout spawning, intensive

patrols and ad-hoc inspections are held with staying overnight in field (there are forest huts for this purpose there);

- access roads to the protected area are blocked with barriers.

Visitation into the territory of CBR is carried out by passes (permits), which are issued either at the administration office of the reserve, or in the field offices.

The challenge in protecting the reserve is that almost 100% of the territory is located in the mountainous area and much of it is located in more than 100 km from the administration's office, as well as by the location of 20 settlements in the area of its activity, which are home to about 100 000 people, that complicates the work of the rangers in ensuring compliance with the established conservation regime when the locals are carrying out traditional nature management (farming etc.).

However, in recent years a clear procedure for organizing the work of the Ranger Service has been worked out in the reserve, which allows ensuring conservation of the protected areas in accordance with the functional zoning of the territory at the proper level. Employees of the Ranger Service passed their qualification exams, and the job descriptions include now all the necessary tasks and responsibilities, ensuring that they fully comply with the established conservation regime and fulfill the necessary environmental protection measures. In order to combat poaching, the system of ad-hoc inspections was introduced in the reserve under the direction of engineers of the State Protection Department with the participation of law enforcement officials. In order to reduce illegal logging, an awareness rising activity is being carried out and legal arrangements are in place to provide the population living in the scope of CBR's location with fuelwood.

Illegal logging is the main breach of the conservation regime in the territory of CBR, as Rakhiv district does not have any centralized gas supply, so the main source of heating for the local population is firewood.

**DISTRIBUTION OF CBR'S TERRITORY**

Table

№	Field division	Area, ha			Total
		Directly managed	Under protection	Used by other land users	
1	Shyrokyi Luh	5654	-	879	6533
2	Uholka	4729	-	4712	9441
3	Bohdan-Petroske	2972	-	815	3787
4	Keveliv	4483	1137	4948	10568
5	Narcissi Valley	256	-	-	256
6	Chornohora	4296	1038	1611	6945
7	Maramures	3103	356	644	4103
8	Trybushany	3037	829	3342	7208
9	Kisva	1682	1406	1542	4630
10	Rakhiv-Berlybaske	1765	1445	57	3267
11	Petros-Hoverlianske	-	1297,8	-	1297,8
<b>Всього</b>		<b>31977</b>	<b>7508,8</b>	<b>18550</b>	<b>58035,8</b>

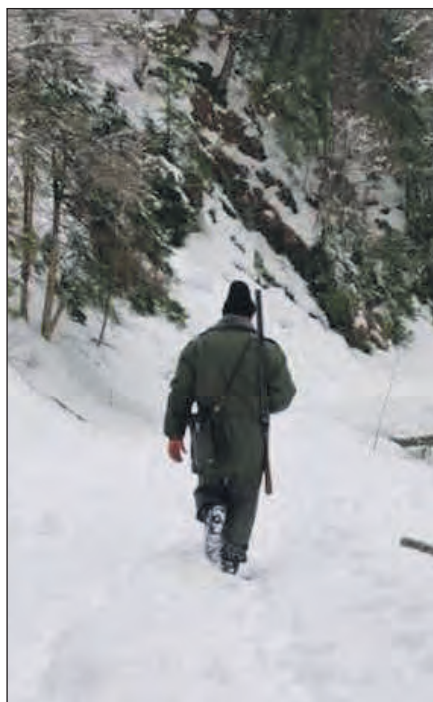
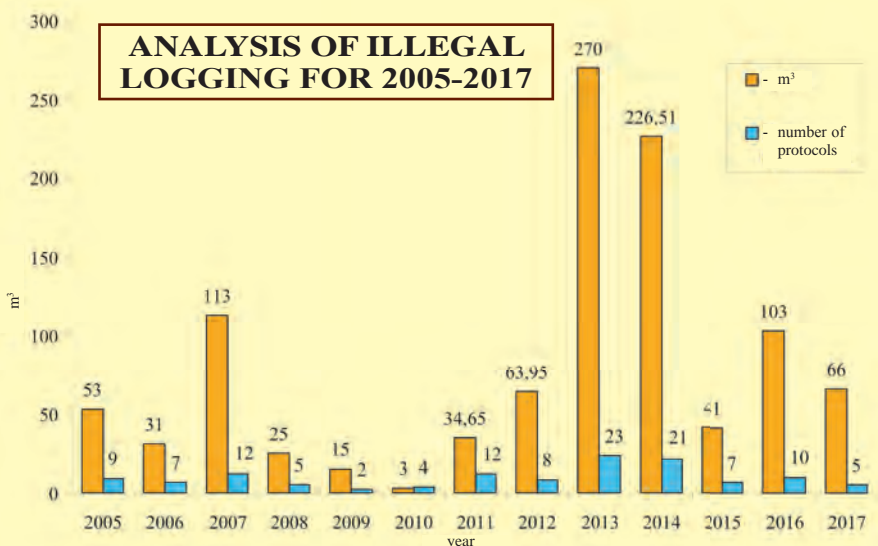
The volumes of illegal logging for the period 2005-2017 are shown in the figure.

For the territory of 31.977 hectares, which is under direct management and ownership of the reserve, we possess state acts for land allocation. Border signs and information boards are installed. In addition, work is underway to restore the boundaries of these sites and enter them into the register of land properties. For the territory, which is given to us under protection (the area of 7.708,8 hectares), the Zakarpattia Public Regional Geodesic Company have developed land surveying documentation for the lands managed by the local village councils, which are now sent for the state expertise. For the territory that is part of the reserve without withdrawing from other land users (the area of 18550 hectares), we've signed obligations for ensuring conservation regime with permanent land-users (state forestry companies).

An insufficient provision of the ranger service with weapons is a problematic issue. There are only 34 shotguns in the reserve, accounting for 23% of the required need. There is also a lack of uniform, cross-country vehicles, fire-extinguishing equipment and so on.

**During territory patrolling;  
from left to right: manager of the  
Bohdan-Petroske field division  
Vasyl SHEMOTA, Deputy Head  
of the Department of State Nature  
Conservation Service Victor  
SHCHERBA and Deputy Director  
of CBR – chief conservationist  
Roman KUZMINSKYI**

**ANALYSIS OF ILLEGAL LOGGING FOR 2005-2017**



## MEMBERSHIP OF CBR IN THE EUROPEAN WILDERNESS NETWORK

*Mykola RYBAK,  
Director of the Carpathian  
Biosphere Reserve,  
Honored Conservationist  
of Ukraine,  
Iryna YONASH,  
Deputy Manager of the  
Department for recreation  
and sustainable development*



The value of our outstanding nature has been many times recognized on the international level, so it is quite logical that the European Wilderness Society got interested in working with the Carpathian Biosphere Reserve. The official partnership of CBR and the European Wilderness Society within the European Wilderness Network has been taking place for just over a year, nonetheless in such a relatively short time, we can show quite significant results of this collaboration.

It started, in accordance with the contract concluded, with an audit of the Uholka-Shyrokyi Luh territory, covering an area of 11,979 hectares, in the summer of 2017. In addition, the contract provides for the possibility of extending an international audit of other potential wilderness territories within the Carpathian Biosphere Reserve (Svydovets, Chornohora, Maramures and Kuziy-Trybushany massifs) in the following years.

At the meeting of the Bureau of the Scientific and Technical Council of CBR, further cooperation with the European Wilderness Society was supported and a decision was made to assist in the audit of other wilderness sites on the territory of the reserve.

The European Wilderness Society is a non-profit environmental organization with an exclusive team of highly-trained professionals: scientists, tourism professionals, marketers and business

professionals, and lawyers, whose mission is to support the preservation of European wilderness.

The organization has developed wilderness quality standards and an audit system based on more than 300 indicators, divided into 9 principles and 72 criteria. Each wilderness area belongs to one of the four categories of the European Wilderness Network: bronze, silver, gold or platinum.

According to the results of the audit, a team of specialists from the European Wilderness Society confirmed the belonging of 7,117 hectares of the territory of Uholka-Shyrokyi Luh massif to wilderness area, and this site was awarded with the certificate of the highest – platinum – level. The certification is valid for ten years.

It was the first important step towards an interesting and fruitful collaboration. Subsequently, in the fall of 2017, the so-called "rapid audit" of the forested territory of the Kuziy tract was carried out by the team of the Society, based on the results of which a bronze certificate of the candidate was given.

Within this cooperation, CBR has taken part in several extremely interesting events, namely:

- Workshop "The Future of Wilderness and UNESCO World Natural Heritage sites in Ukraine" in the spring of 2018 and the eco-educational exhibition "Coexistence of man and wilderness".

- Wilderness Rangers Academy – USA, Red River, New Mexico, the summer of 2018.

- An airplane for artists in the wilderness area of Synevyr, the summer of 2018.

- Visit of the directors of the Austrian national parks to CBR.

We want to dwell on each of the events separately.

### WORKSHOP "THE FUTURE OF WILDERNESS AND UNESCO WORLD NATURAL HERITAGE SITES IN UKRAINE"

In May 2018, four representatives of the Carpathian Biosphere Reserve participated in the events organized by the European Wilderness Society in Uzhgorod. The program of the events included a seminar of the Wilderness Society with the activists from other protected areas with the participation of a representative of the Ministry of Ecology and Natural Resources of Ukraine; also there was held a display of the eco-educational exhibition "Coexistence of man and wilderness".

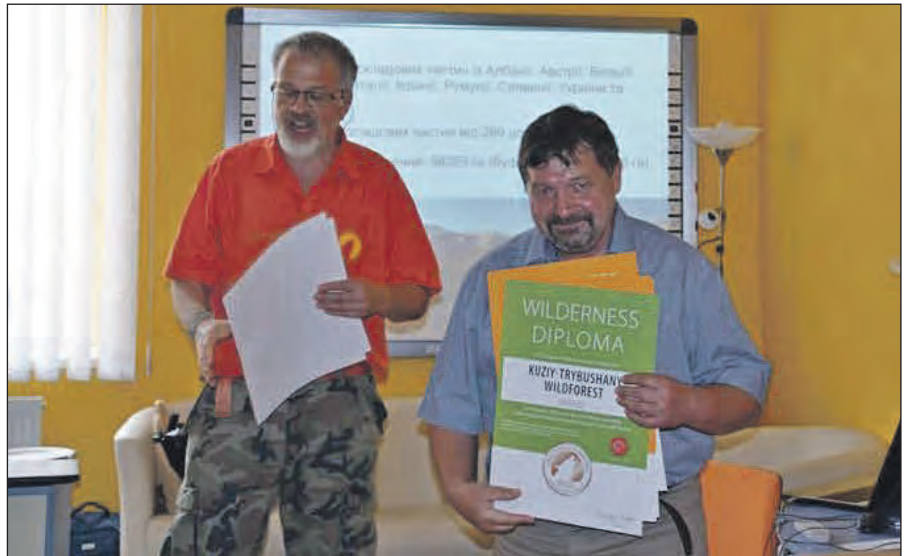
The workshop consisted of two information blocks and a moderated discussion between the participants to

exchange the information and share their management experience and addressing issues related to UNESCO World Heritage Property.

The seminar included several presentations made by the Wilderness Society representatives on the current state and further development of the European Wilderness Network, planning of wilderness audit missions to other territories in Ukraine. In addition, the challenges and threats for the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" were discussed, as well as the problems of managing the World Heritage Property components for each of the protected areas owning such components.

Within the framework of the moderated discussion, the problems encountered in the process of nomination and management of the components of the UNESCO World Heritage Property, as well as ways of solving some of them, were more widely discussed. In addition, the issues of possible mutual assistance within the European Beech Forest Network and individual protected areas were discussed. During the discussions, several interesting ideas were presented regarding overcoming problems in meeting the needs of communities, in particular those in the area of CBR's activity.

The participants also agreed on providing CBR with the materials for a thematic eco-educational exhibition of the European Wilderness Society under the slogan "Coexistence of man and wilderness", as well as on conducting a training session using innovative



**Director of the European Wilderness Society Max ROSSBERG and his deputy Vlado VANCURA present certificates on inclusion of new CBR's areas into the European Wilderness Network to the director of the institution Mykola RYBAK (photo in the middle) and the researcher of CBR Vasyi POKYNCHEDA (upper photo); during the eco-educational exhibition "Coexistence of man and wilderness"**



**Ukrainian Ranger Mykola ROMANYUK in New Mexico; competition in cooking in the open air. Everyone enjoyed the Hutsul corn meal "kulesha" made by Mykola ROMANYUK; Ranger Academy members maintaining a mountain trail**

interpretive techniques to improve understanding and remembering the information presented at the exhibition. This eco-educational exhibition aims to help a wide range of visitors raise awareness and understanding, acceptance and respect for protected areas, wilderness, large predators and the coexistence of man and wilderness.

## ACADEMY OF WILDERNESS RANGERS

Another interesting event during the collaboration with the European Wilderness Society was the participation of a CBR's representative at this year's Wilderness Ranger Academy in Regions 2 and 3 of the US Forest Service in Red River, New Mexico. This year's program of the US Ranger Academy for the first time involved foreign participants into the training sessions and allowed to exchange experience with the representatives from other countries. In this way, the

exchange program between the European Wilderness Society with the US Forest Service was initiated. Next year, more rangers from the European Wilderness Network will be able to participate in the event!

The requirements for the program candidate were as follows:

- be working for a partner of the European Wilderness Network;
- have at least 3 years of experience in field work;
- to be fluent in English;
- to be able to properly present their protected area (deliver a presentation);
- have experience in cooking meals on open fire;
- to have personal protective tourist gear;
- to have a letter of recommendation;
- to prepare a short motivation letter.

It was very difficult to identify a participant who would meet these requirements and could represent our institution accordingly. In the end, Mykola Romanyuk, a leading engineer on natural ecosystems of the Department of State Nature Conservation, which is analogous to the ranger service in the United States and other countries, was selected as a candidate from CBR To get ready for his participation in the training course and to present our protected area there, considerable work has been done by Mykola to collect and process information on the structure of the State

Nature Conservation Service and the organization of the ranger service in our country.

What is the US Wilderness Academy doing? Its purpose: to provide wilderness field ranches, and seasonal rangers and volunteers with a tool kit of professional wilderness management skills.

Last year's training program was rich and exciting, especially for those who first visited the United States. The training itself is intended to give the Rangers the necessary legal and practical knowledge to ensure their safety while staying out in field. Lectures covered the history and fundamentals of the US Wildlife Act, as well as the values and marketing principles of wilderness management in the US.

Representatives from different countries were able to give a brief overview of their protected area and the work they do. These presentations helped to see the different approaches to the management of the protected areas and provided the basis for further discussions and exchange.

In addition, as 2018 marks the 50<sup>th</sup> anniversary of the U.S. Wild and Scenic River Act, Academy members have been fortunate enough to visit incredibly beautiful river sites and take part in the Rio Grande River Raft. For Mykola, it was the first experience of this kind, and he received an unforgettable experience.



The 2018 Academy training ended with an encouraging speech delivered by Dave Foreman, a US wilderness conservation veteran.

After the training course was over, the foreign participants discussed and elaborated own working plans for future.

Here is how Mykola Romanyuk comments on his trip: "That week was the most incredible in my life. I first visited the USA, which was my dream. I had the opportunity to meet interesting people from the US and other countries and see how the Forest Service trains its rangers how to build and maintain hiking trails. In my opinion, they are doing a tremendous amount of work to teach people how to protect nature for generations to come. It was a very rewarding experience for me".

However, even though the participants learned a lot of useful things, not all the knowledge can be applied in other countries due to significant differences in the legislative framework and in the citizens' mindsets.

As for the European Wilderness Society, their plans (in collaboration with the US Forest Service) is to design a common image of a European Wilderness Ranger for the European Wilderness Network. And perhaps, as a result of such work, in the near future, the Ranger School will be held in Europe, according to the program adapted to our realities.

We hope for further development of cooperation in this direction.

## PLEIN AIR FOR ARTISTS IN SYNEVYR WILDERNESS AREA

One of the most striking activities in the framework of this cooperation was the open air workshop for artists in the wilderness area of Synevyr. CBR representatives took part in the final event of the plein air, which was held at the end of the summer of 2018 and was conducted by the CBR's partner – the European Wilderness Society and the Synevyr National Nature Park. Ruslan Glib, Senior Researcher of the CBR's forest research laboratory participated in the plein air as an amateur artist.

The recreational site of Rabachynka was turned into an art residence. The event was implemented within the framework of the "Territories of Inspiration" project, which was supported by the European Union under the Creative Europe program. Such plein airs will be held in other European countries as well, and their goal is to stimulate the interest of artists and creative people in rural areas as a source of inspiration. At the same time, creative work will be used to enhance local development,

nature conservation and cultural heritage through the international cooperation and promotion of the beauty of wilderness and the rich culture of rural localities. Part of the paintings made during the plein air was directed for the organization of the wilderness art exhibitions in European countries, as well as for sale at auctions to raise some financial support for project activities.

The program of the plein air included field trips to the forest sites, the Synevyr Lake and the waterfall.

Students and participants of the final event were able to enjoy the results of the artists' creative activity, to have some 'wilderness art' lessons, and to try to create their own masterpieces. Students were also asked to paint eco-bags so they got a great souvenir as a token of the event.

The creative event was attended by 11 artists from 5 European countries: painters, photographers, dancers and printers. Dutch film directors Rick Lichtenberg and Richard Ferbeck documented the event for the film on the progress and results of the project, which will later be available on the European Wilderness Society's website (<https://wilderness-society.org/>).



**Senior Researcher of the CBR's Forest Research Laboratory Ruslan GLEB  
– participant of the plein air workshop for artists in the Synevyr NNP**



## NATIONAL PARKS DIRECTORS – GUESTS AT CBR

It is worth mentioning that, with the information support of the European Wilderness Society, the directors of the Austrian national parks came on a brief visit to CBR in the summer of 2018.

In connection with the transformation of a trilateral (Ukraine, Slovakia, Germany) UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and Ancient Beech Forests of Germany" into a pan-European Property "Ancient and Primeval Beech Forests of the Carpathians" and Other Regions of Europe" in 2017, which today brings together 12 countries on the continent, the Carpathian Biosphere Reserve has become the center of attention as a pioneer in the development and implementation of mechanisms for the practical management of this World Heritage Property. Austria is one of the newly acceded countries and does not have the relevant experience, which has prompted the Austrian delegation to visit our institution.

CBR employees, led by director M.P. Rybak, warmly welcomed the guests and provided all the necessary information. The delegation, which was primarily interested in the Carpathian beech primeval forests and Ukraine's experience in their conservation and management, consisted of 6 directors of Austrian national parks and two managers of the Association of National Parks of Austria. The leader of the delegation was the head of the Association, which is the highest authority in the management of protected areas in Austria, because, due to the federal regulation, there is no corresponding governmental analogue to this service in their country.

Visiting the Uholka-Shyrokyi Luh protected massif of CBR was not accidentally suggested, because



**Directors of the Austrian national parks visited the Uholka primeval beech forest site of CBR**



this territory harmoniously combines both impressive natural resources and cultural and historical monuments. The program of the visit, which was held under the auspices of the Ministry of Natural Resources of Ukraine, included visits to the most interesting tourist sites of Veyka and Mala Uholka, as well as excursions to the most remote and inaccessible places of the primeval forests. An important element of it was learning about the basics of the biosphere reserve's operation, features of practical management of the WH Property and the experience of CBR in mitigating conflict situations that arise in the course of nature resource management in the territory of the biosphere reserve and in the area of its activity.

The program was rich and informative, daily the guests were hiking along mountain trails over 15 km in length. They also got acquainted with the features of local cuisine, tasted the traditional dishes of the mountain-heights dwellers. All of them, without exception, received valuable experience and positive impressions from the visit and in response invited CBR's representatives to visit the national parks of Austria and to get acquainted with the peculiarities of their operation. It was the first, but very important, step towards establishing friendly relations and fruitful cooperation between the Ukrainian and Austrian protected areas in the context of the conservation and management of the unique natural values of this UNESCO World Heritage Property.

\* \* \*

**Also, at the end of summer – 2018** (within the framework of cooperation development and increase of the Ukrainian components' number in the European Wilderness Network) a working meeting with the representatives of the European Wilderness Society took place. According to the signed contract, the details of a rapid audit of potential wilderness sites in the Maramures massif of the Carpathian Biosphere Reserve were discussed. To accomplish this task, two representatives of CBR had been guiding the representatives of the Society to the most intact and wildest places of the

massif for three days. During this short-term visit, a team of specialists conducted an analysis of the mountain massif's territory according to 9 wilderness criteria and identified the sites that met those criteria. According to the results of the rapid audit, the identified territory has an opportunity to be awarded with a wilderness certificate of the appropriate level – bronze, silver, gold and platinum, as well as to become one more part of the European wilderness network for a period of up to 5 years (with further audit and membership extension). In addition, we have the unique opportunity to obtain our first Wilderness Certificate, since today almost nowhere else in Europe we can find untouched alpine meadows where no sheep or other domestic animals are grazed, and the Maramures mountain massif may become the first territory of this kind if the data is confirmed.

The results of this work will help to present our institution on a larger scale, to inform the European and world community about the natural values of CBR, and to promote the development of the recreational potential of the region.

The landscapes of the Carpathians not only attract people with their beauty, but also serve as a model of an undisturbed nature. In today's industrialized world, there are very few places left with truly untouched natural tranquility, and remaining ones are at risk because they have useful natural resources, attractive for businesses. Although the benefits of natural resources may not only be material, many people are not yet aware of it. Civilized countries are increasingly paying attention to environmental issues and nature conservation, but they practically don't have any sites left not impacted by human intervention. It is the Carpathian Biosphere Reserve that protects unique territories that not only have not been affected, but can also serve as a model for the existence of the untouched wilderness. Collaboration with such active organizations as the European Wilderness Society is the best instrument to promote CBR's conservation activity at the international level.



## MOMENT OF TRUTH:

### QUESTIONARY ON OCCASION OF ANNIVERSARY

**Barbara ENGELS,  
Federal Agency for Nature  
Conservation, Bonn**

1. CBR plays a significant role in protecting the globe's most valuable beech forest sites!
2. Recognition of CBR's territory as part of the UNESCO World Heritage Property in 2007.
3. To launch sustainable development projects that would link the environmental activity with benefits for people.
6. My first excursion to the primeval beech forests of Uholka, when I almost got lost among the deadwood!





**Iryna YONASH,**  
*Deputy Manager of the Department*

The experience of developed and developing countries undoubtedly shows that for Ukraine, its regions and cities, the issue of providing recreational services is extremely important, relevant and promising. Thanks to this, it is possible to ensure a higher quality of the economic growth, social security, as well as to improve the well-being of citizens and overcome the uneven development of territories. The global experience proves that the recreational sphere naturally and harmoniously combines all opportunities for human and social development on the basis of existing local resources.

The main objective of the protected areas has always been conservation of natural landscapes and biodiversity. In order to safeguard preservation of unique and typical natural landscapes and to reduce the rate of biodiversity loss it is a must to establish and develop an effectively managed system of protected areas as a basic element of ecologically balanced socio-economic development of any country or region. Today, the protected areas are granted the right to organize tourism and recreational activities. This sphere is regulated by the statutes for recreational activities within the territories and objects of the protected area system of Ukraine, designed to ensure the conditions for organized tourism, recreation and other activities in natural conditions, with compliance with the regime of protection of natural complexes and objects, as well as improvement of recreational activities within protected areas of Ukraine. Recreational activities in the protected areas, like all their activities in general,



**Denys KUKHAR,**  
*Leading specialist of the Department*

are organized in accordance with the functional zoning, spatial planning and management plans.

All activities in the territory of the protected area network of Ukraine are regulated by the Law of Ukraine "On the Protected Area System of Ukraine", adopted on 16.06.1992, Article 9 of which says the following: "Territories and objects of the protected area system of Ukraine may be used for the activities listed below, provided that the requirements outlined by this Law and other legislative acts of Ukraine are observed:

- for wellness and other recreational purposes..."

According to the "Regulations on recreational activity within the territories and objects of the Protected Area System of Ukraine", approved by the Order of the Ministry of Environmental Protection of Ukraine dated on 22.06.2009, the main spheres of recreational activity in the territory of PAS are:



**Roman KUZMINSKYI,**  
*Leading engineer of the Department*

- creation of conditions for organized and efficient tourism, recreation and other leisure time activities in the natural environment upon condition the regime of natural complexes and objects protection is observed;

- satisfying the demand of recreational tourists for wellness, cultural and educational holidays, tourism, amateur and sport fishing, hunting, etc.;

- substantiation and establishment of permissible anthropogenic (recreational) pressure in the territory of protected areas of Ukraine;

- organization of advertising, publishing and information activities, as well as eco-education among holiday makers and tourists within the territories and objects of the PAS of Ukraine;

- formation of ecological culture for the recreationists and local people and promotion of a careful and humane attitude to the national natural heritage.



# IN TUNE WITH THE TIMES

## DEPARTMENT FOR RECREATION AND SUSTAINABLE DEVELOPMENT OF CBR

Issues of tourism and recreation development in the territory of CBR have always occupied an important place in the working agenda of the institution. It is one of the main fields of activity of the Carpathian Biosphere Reserve. Initially, recreational activity was within the competence of the Department for awareness rising and eco-education, but in 2010 a separate Department for recreation, public relations and international cooperation was created at CBR, which was transformed into a recreation and sustainable development department in early 2018.



**"Carpathian Highlands"  
Tourist Information Center;  
cycling marathon  
"Along the Trails of Opryshky";  
a hiking tour to Pip-Ivan  
of Chornohora Mt.;  
marking a mountain  
hiking trail;  
participants of the Chornohora  
Night Marathon**



Since 2011, the CBR's territory includes 11 field divisions, where a network of 18 ecotourism routes with a total length of more than 200 km has been developed. Since its designation, the Department has been involved in organizing the works on hiking trails development and marking, the effective recreational arrangement of places popular among holiday makers, as well as conservation of natural values and their rational use, strengthening and improvement of tourism infrastructure. Significant efforts in the work of the department are aimed at promoting the Carpathian Biosphere Reserve as a recreational and tourist site. As part of this activity, employees of the department participate in various tourist exhibitions and forums, ecological events, ecotourism excursions, as well as we systematically submit information to various print and electronic media, Internet resources and social networks. We also distribute printed materials on ecotourism guesthouses and existing tourist services through the visitor centers of CBR.

The department collects and organizes data on visitation intensity to field divisions of the reserve, and completes the database on these visits. Thus, from 2010 to 2017, about 260 000 of people visited the territory of the reserve. Rules and guidelines for visitors' behavior within the protected area have been developed,

and work has been undertaken to attract tourism businesses, and about 15 tourist-recreational cooperation agreements have been concluded with them. Within the framework of such cooperation, mass tourist events and marathons are held annually ("Chornohora Night Marathon", "Sky-Marathon", cycle marathon "Along the Trails of Opryshky", etc.).

Over 200 km of trails have been signed and marked over the period of the department's activity, and these facilities have been improved and updated every year. The 18 existing tourist routes were maintained and described, 5 more new hiking trails were developed and included into the new CBR management plan. During the tourist season, employees of the department annually organize excursions for tourist groups of different age categories in the high-mountain areas of CBR and to the most interesting natural and cultural sites of the protected area. In addition, together with the department for ecological education, the organization of internships for students of higher educational establishments is provided both nationally and internationally.

Apart from that, cooperation with various target groups of the population is initiated, and awareness-raising work on the ecotourism and conservation activities of the institution and on sustainable development of the territories

is underway. The specialists of the department participated in a number of meetings with the representatives of the communities on the issues dedicated to the use of opportunities of socio-economic programming, formation of environmental consciousness, discussing mechanisms for establishing cooperation and so on. An informative presentation on the tourist and recreational potential of the institution has been created. Lectures and presentations are organized in the schools of Rakhiv on the topics of nature conservation, tourism and recreation.

Concerning the development prospects and the department's plans for the future:

Although much has been done, unfortunately the recreational potential of our territory is not yet fully used, both in terms of attendance and recreational facilities. In addition to the need for the development of tourist infrastructure, in the working plans of the department there's a clear stress upon the need to meet current trends, namely – launching GPS-tracking on all the developed tourist routes with their further mapping.

There is also a considerable potential to develop and equip new routes leading to interesting and scenic places in our region, which would not only diversify the list of hiking trails, but also reduce the pressure upon the existing ones in order to avoid recreational overload and damage to the environment.

Moreover, it is necessary to systematize the information for each route with visualization of landmarks and properly designed maps, and then printing a nice attractive publication for visitors (a booklet).

At the same time, the possibility of studying the potential of CBR in terms of the development of equestrian and cycling tourism is being considered, with the development of appropriate proposals. In addition, it is planned to develop a finished tour product based on the hiking trails of CBR (for example, "Weekend Tour" for family holidays).

In short, our department is still relatively young, and the recreational activity of CBR has considerable potential for development. We will continue to make every effort to explore it and introduce new trends to keep up with the times.



Resting-place and information board in the Trybushany field division

## ABIOTIC ENVIRONMENT MONITORING IN THE CARPATHIAN BIOSPHERE RESERVE – ACHIEVEMENTS AND PROSPECTS

**Petro PAPARYHA,**  
*Head of the Laboratory  
of Ecological Monitoring  
of CBR, PhD in Geological  
Sciences;*  
**Lyudmyla PIPASH,**  
*Senior Researcher;*  
**Natalia ANDRIYCHUK,**  
*Leading Engineer;*  
**Anatoliy VEKLYUK,**  
*Researcher*



**From left to right: Natalia ANDRIYCHUK, Petro PAPARYHA  
and Lyudmyla PIPASH**

Since its designation (1968) and thanks to several stages of expansion, the massifs of the Carpathian Biosphere Reserve are now located within the Vynohradiv, Khust, Tiachiv and Rakhiv districts of Zakarpattia region. Such cluster structure of the massifs ensures the presence of all vegetation and climatic zones of the Ukrainian Carpathians – from the foothills up to the subalpine and alpine zones with a corresponding biogeographic diversity.

In the first ten years of the institution's activity, abiotic studies were not systematic and were conducted by various scientific establishments on the basis of agreements on cooperation. To study the natural processes occurring in different parts of the reserve, and to initiate appropriate monitoring, it was planned to organize a wide network of hydrological and weather stations. With this purpose, at the end of 1977, two stations of this kind were established near the lower boundaries of the territories of the Uholka and Hoverla forestry districts: Uholka – in the valley of the Mala Uholka River (410 m a.s.l.), and Hoverla – in the Prut River valley. During the process of establishing the Carpathian National Nature Park (1980) the Hoverla hydrological and weather station along with the territory of the Hoverla forestry district became part of the newly-established park. Instead, again in 1980, on the south-western

macro-slope of the Chornohora massif, in the place where the Bilyi and Brebeneskul mountain streams merge together a Chornohora weather station was established (750 m a.s.l.). Both the Chornohora and Uholka weather stations are still working till today, and we can proudly say that we possess weather and hydrological data from a continuous observation process which has been lasting for 40 years. The next weather and hydrological station was opened in 1987 in the Shyrokyi Luh protected massif of Tiachiv district (525 m a.s.l.) in the summer of 2003 a weather station was opened at the central office of CBR (Rakhiv, the Piddil tract, 395 m a.s.l.), and in 2009 we launched the weather and hydrology station in the Narcissi Valley field division (Kireshe village of Khust district, 180 m a.s.l.).

Phenological observations have been carried out in the territory of the reserve for 40 years already, which cover natural changes of biota and abiota, the outcomes of which make up the foundation for special chapters in the Chronicles of Nature (annual report). First phenological observation plots were laid at CBR by its scientists Heorhiy Lazutkin and Dmytro

Sukharyuk back in 1978 in the Chornohora forestry district along a mountain profile, which stretched from the lower forest vegetation zone to the sub-alpine belt. After that, in 1979-1983 phenological research plots appeared first in Uholka and then in Shyrokyi Luh field divisions. The data obtained from these plots are entered into the Chronicles of Nature in the chapter "Calendar of nature". The sampling methodology and studying them in office and methods of their presentation have remained practically unchanged and last till now. Today, the network of phenological plots and phenological routes covers various natural complexes and altitudinal-climatic belts, and we can find these elements in 10 field divisions of the reserve, and also in the territory around the central office of CBR and in the Narcissi Valley at the altitudes from 180 up to 1220 m a.s.l. data collection takes place based on 21 phenological research plots, 61 phenological routes and on the botanical collection plot located in the territory around the central office of CBR.

In order to study the dynamics of snow cover within the core zone of the reserve, taking into account its mountainous terrain,

in 1985 in Uholka and Chornohora massifs of the Reserve its scientists started the observations of the depth of snow cover on permanent vertical ecological profiles, taking into account the parcel structure of forest stands. Snow measuring survey was performed on ten snow-measuring plots, distributed from the lowest limits of the reserve up to the upper forest line, approximately every 100 meters above sea level. In the future, these polygons were completed with meteorological devices. Data were collected weekly. The ideological inspirers, organizers and at the same time direct performers of hydro-meteorological and phenological investigations, as well as snow cover and avalanches observations on the territory of the reserve during the first years were D.D. Sukharyuk and H.H. Lazutkin. Subsequently, these works were carried out by V.M. Antosiak, V.I. Kudrych (over 25 years), E.K. Liashenko, T.M. Kashyna, E.I. Romanyuk, N.P. Ihnatko, Yo.Yo. Bundziak, A.V. Kozurak and others.

Over the last decade, a number of research programs and methods have been developed by the researchers of the Laboratory of ecological monitoring, and a series of scientific polygons (hydrological, meteorological, phenological, a network of wells for the study of ground water level and its dynamics) have been designed; they

initiated ecological data collection for the Narcissi Valley, which has undergone meso- and xerification processes in recent decades due to various reasons. In particular, in 2008 a program of complex studies of the species composition dynamics and structure of phytocenosis, depending on the elevation of the groundwater level was developed, discussed and approved at the Scientific and Technical Council of CBR. For this purpose, a hydrological and botanical sample plot was established, consisting of a regulating flood-gate on the main reclamation channel and a network of wells to monitor the groundwater level and their physico-chemical parameters. According to the research program, a botanical test area (inventory sites) for studying the dynamics of the species composition and phytocenosis structure, depending on the elevation of the groundwater level in the area of the gateway, is laid near each well. As a result of installation of this flood-gate, the water level in the reclamation canal is artificially raised by 0.5 – 0.8 meters. The observational data obtained over the last ten years indicate that the water level in the wells is entirely dependent on the water level in the gateway and is maintained at almost constant level. At the same time, the analysis of the data of the botanical inventory sites, which have been laid near each well, indicate

a positive trend towards an increase in moisture-loving plants, including the *Narcissus angustifolius*, starting only from 2010-2011. And since 2013 on the experimental plots we can observe a significant increase in the population of *Narcissus angustifolius*. In 2012-2013, two more similar research plots were arranged with simultaneous raise of the groundwater level at different levels, which would allow us to quickly conclude on the optimal hydrological conditions necessary to preserve the species composition and structure of the phytocenosis and protect them from negative impact (in this case – the processes of meso- and xerification). Long-term research data obtained since the establishment of floodgates with a corresponding rise in groundwater level will allow us to develop specific recommendations for further regulatory measures that would optimally bring the hydrological situation in the Narcissi Valley to its natural state. At present, five hydro-control flood-gates have been installed and are operating in the Narcissi Valley protected massif, which ensure that groundwater levels are raised to the optimum level.

According to a special program, blocking cascades (4 pieces) were constructed in the territory of the Narcissus Valley along the main irrigation canals



**Researcher Anatoliy VEKLYUK during weather data sampling at the weather station located at the central office of CBR; Senior Researcher Heorhiy LAZUTKIN and Petro PAPARYHA, Head of the Laboratory, at one of the phenological observation plots in the Uholka field division (2007)**

consisting of intertwined willow branches and exposed soil. This allowed raising the level of groundwater and, as a consequence, to increase the population of hydrophyte red-listed plant species.

One of the tasks for the biosphere reserve as a conservation and research institution is to carry out background monitoring, and to study of the environment under the influence of anthropogenic factors. Hydro-chemical investigations have been an integral part of it and have been conducted at CBR since 2001, after the chemical laboratory was organized here. It should be noted that until now such work in the reserve has not been systematic and was carried out selectively in separate years by third-party scientific institutions on the basis of cooperation agreements. Thus, in the materials of the Chronicles of Nature for 1987 the results of chemical analysis of melt water samples from snow samples are presented, as well as of surface and groundwater samples taken at different points of the Chornohora Massif of the Reserve (CBR) and the outskirts of the town of Rakhiv taken by the staff of the Geography Department of the Moscow State University under the lead by Ph.D. I.I. Altschuller.

Today, in the chemical laboratory, which is part of the Laboratory of ecological monitoring of the reserve, the following hydro-chemical tests are made:

- surface (rivers, streams, lakes) and groundwater;
- groundwater (hydro-biological sample plot in the Narcissi Valley);
- precipitation (rain, snow);
- integral samples of snow cover from the highest mountain peaks and surrounding areas.

Identification of the content of basic ions of salt composition is carried out, namely:  $\text{SO}_4^{2-}$ ,  $\text{Cl}^-$ ,  $\text{Ca}^{2+}$ , in  $\text{mg}/\text{dm}^3$ ; total alkalinity and stiffness in  $\text{mg-eq}/\text{dm}^3$ , iron, nitrates in  $\text{mg}/\text{dm}^3$  according to standard procedures.

Monitoring of the hydro-chemical composition of water in the main CBR's watercourses started in 2001, and monitoring of the hydro-chemical composition of precipitation started in 2003. Now, the data for 16 years of hydro-chemical water composition research are available for all of the CBR's remarkable watercourses and for the adjacent territories, which were sampled during the main hydrological phases (spring snowmelt, after floods, during floods, etc.) at the same permanent sampling points (Chronicles of Nature of CBR, 2002-2017).



## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

**Petro PAPARYHA,**  
*Head of the Laboratory  
of ecological monitoring  
of CBR*

2. International recognition (inclusion into the UNESCO MAB World Network of Biosphere Reserves and confirmation of this status), expansion of the territory of the institution at the expense of especially valuable undisturbed or little-disturbed territories, inclusion of beech primeval and ancient forests in the UNESCO World Heritage List, close cooperation with scientific institutions and protected areas of Ukraine and Europe, developing the reserve into a strong research and eco-educational center.

3. To establish an interdepartmental background monitoring station in the Chornohora massif of CBR in the saddle between Hoverla and Petros mountain peaks (1550 m a.s.l.). The feasibility of such a station was previously discussed by the representatives of the Zakarpattia Regional Meteorological Office and CBR. Currently, specialists of the Central Geophysical Laboratory named after Boris Sreznevskiy supported this proposal.

5. More than 80 scientific papers have been published, PhD degree and an academic title have been obtained. Plans for the future – enhancing the academic degree, delivering the most effective and productive work to the institution.

6. Defense of the PhD thesis in 2010, obtaining an academic title in 2013, enrollment to the doctoral course in 2014. Participation in the implementation of the Ukrainian-Swiss project "Scopes 2005–2008: "Institutional Partnership" ("Cooperation between institutions: 2005 – 2008") dedicated to the research of the primeval forests composition and structure, and the Ukrainian-Dutch project "BBI-MATRA 2006–2007" ("Forests of Transcarpathia (Ukraine) as core areas of the pan-European ecological network").



The purpose of hydro-chemical research in CBR is to monitor and evaluate the state of natural waters: surface (rivers, streams, lakes) and atmospheric (rain and snow), which are necessary for the research of natural processes, as well as for assessing possible anthropogenic changes. Such changes are best recorded by hydro-chemical parameters (ingredients) in water bodies, since they play an important role in the physiological, bio- and geochemical processes occurring in soil, water and plants, they also determine the optimal conditions for the existence of living organisms and their biological productivity. The study of the distribution patterns of pollutants in them allows you to reliably assess the extent and parameters of contamination of the territory.

Starting from 2010, the laboratory together with scientific team members of the Institute of Geochemistry, Mineralogy and Ore Formation named after M.P. Semenenko of the NAS of Ukraine conducts monitoring researches on the topic "Dynamics of heavy metals in the natural complexes of the Chornohora massif of CBR and adjacent territories" based on the agreement on creative cooperation. According to the developed methodology and the research program, the relevant samples are collected annually in the territory of the Chornohora massif of CBR and the adjacent territories, with their subsequent analysis for the content of heavy metals. In the same year, a research was started on the topic "Monitoring of macro- and micro-component composition of integral samples of snow cover taken from the highest mountain peaks of CBR and adjacent territories". From 80 to 100 samples of snow cover are selected

annually from 18 permanent selection sites. The macro-component composition of snow waters and their hydrogen index are determined in the chemical laboratory of the reserve by appropriate methods, the analysis of the micro-component composition is carried out at the Institute of Geochemistry, Mineralogy and Ore Formation named after M.P. Semenenko of NAS of Ukraine (Kyiv) according to the agreement on creative cooperation. The results of the studies are incorporated into corresponding sections of the Chronicles of Nature and are also published in top professional journals.

The basis for global background monitoring today is provided by biosphere reserves (630) established and registered in accordance with the UNESCO Program "Man and Biosphere" (630) in 120 countries. CBR is one of the institutions where background monitoring should be carried out with the aim to identify major ecosystem changes. Unfortunately, for various reasons, no biosphere reserve on the territory of Ukraine corresponds neither to the general concept of MAB biosphere reserves, nor to the strategies and statutory frameworks for the UNESCO MAB biosphere reserves, which have been approved under the UNESCO Man and Biosphere Program. Based on the above-mentioned facts and with a view to the implementation of the "National Program for Protected Area System Development for the period up to 2020", adopted by the Government of Ukraine in February 2006, with regard to the establishment of cross-sectoral stations for background monitoring and the international commitments undertaken by the states-parties, the Central Geophysical Laboratory

(CGL) named after Boris Sreznevskyi initiated designation of interdepartmental background monitoring stations. Currently, negotiations are underway between the CGL and CBR to establish such a station at CBR. In particular, in order to ensure background monitoring of pollutants in the Carpathian Biosphere Reserve in full, according to the structure and content provided in the Program prepared by the Borys Sreznevskyi Central Geophysical Laboratory, CBR proposed to join efforts with the Zakarpattia Hydro-Meteorological Center to create an inter-institutional center for background monitoring in the tract "Peremychka" – a saddle between the mountains of Hoverla and Petros (1550 m a.s.l.). This site is located within the main watershed of the Ukrainian Carpathians, in the highest mountain range, and is characterized with the availability of access roads, tourist information infrastructure, available water supply, which is extremely important for the organization of a background monitoring station (construction of a laboratory building, technical and residential premises, service facilities, alternative energy sources, etc.). The feasibility of arranging a joint inter-institutional background monitoring station at this location was previously discussed with the representatives of the Hydro-Meteorological Center, Zakarpattia CGL and CBR during an in-situ inspection of the location planned for the background monitoring station in the Peremychka Tract.

A preliminary list of measures (the structure and content of the background monitoring program, list of necessary equipment, relevant regulatory documents, staffing, terms of reference for the personnel, etc.) has been prepared, which is planned to be discussed and agreed with all stakeholders at a general workshop, so that the central executive bodies can further work on them. The availability and proper functioning of the background monitoring station will make it realistic to carry out the study and accumulation of a large number of continuous monitoring and measurement observations, and also will allow timely measures to be taken to stabilize and eliminate possible environmental problems caused by the development of the national economy complex that would not have a harmful effect on people. Only in this case it is possible to predict the ecological state of the environment with the aim of timely elimination of natural and man-made factors of adverse impact on the health of the population and biota in general.



**In the chemical laboratory of the Carpathian Biosphere Reserve**



## ECO-EDUCATIONAL ACTIVITY: FORMATION AND MODERN STATE OF WORK WITH YOUNG GENERATION



**Victoria BUNDZIAK,**  
**Manager of the Department**  
**for Ecological Education**  
**of CBR**

**E**coeducation is one of the main tasks of the Carpathian Biosphere Reserve. Article 9 of the Law "On the Protected Area System of Ukraine" points out the use of protected areas "for educational purposes". According to the aforementioned Law, the eco-educational activities, among others that are conducted and organized by the Carpathian Biosphere Reserve in its own territory and the adjacent areas, are defined and to be justified in the Management Plan. The main directions, the procedure for organizing and conducting eco-educational work, as well as interaction with the public are determined by the Regulation on eco-education activity of institutions of the protected area system of Ukraine, approved by the Ministry of Justice of Ukraine in 2015.

The eco-educational division was established at the Carpathian Biosphere Reserve in 1997.

For over 20 years of its existence, the department of environmental education has changed its staff number few times; it has been repeatedly reformatted and today it is the main, but not the only structural unit of the reserve, which is working on improvement of the level of ecological education and culture of different focus groups.

Thus, in 1997, the Department for the dissemination of ecological knowledge, recreation and tourism had six employees. The newly created unit had complex tasks. In addition to the manager of the department, here also worked a manager of the Museum of Mountain Ecology, leading specialists in recreation and tourism and public relations and media, an ornamental design specialist, a leading engineer of the publishing center. Over time, the number of eco-education team members increased. Thus, in 2002 it was composed of 9.5 staff units, in 2003 – 10.5, in 2005 – 12.5. The department included the editorial board of the all-Ukrainian ecological popular-science magazine "Green Carpathians" (Zeleni Karpaty), a video studio, specialists in recreation, library and museum specialists, and people dealing with public relations and mass media, eco-educators. In this way, serious foundations were laid for the development of several areas of activity of the Carpathian Biosphere Reserve: editorial and publishing, recreational and international cooperation, museum management and ecoeducational. A new unit was created in 2010 – the Department for Recreation, International Cooperation and Public Relations. Since 2011, a separate structural unit was started based at the Museum, which allowed organizing its activities more systematically and to focus on the active educational role of the museum unit. The Museum team

has 4 members. In 2011, the staff of the Department for awareness rising and eco-education had 9.5 staff members, including 3 working at the editorial board of the All-Ukrainian ecological and popular-science magazine "Green Carpathians", 2 – the staff of the ecological and educational center "Center of Europe", 0.5 of work load – a librarian. And finally, the last to go for "free navigation" was the editorial and publishing direction. In 2016, the editorial office of the Green Carpathians was withdrawn from the staff structure of the Department for ecological education. It joined a newly created unit – the editorial and publishing department of scientific and popular-science publications. The department organizes the publication of the periodicals issued by the reserve – the All-Ukrainian Ecological Scientific-Popular Magazine "Green Carpathians", the regional ecological newspaper "Newsletter of the Carpathian Biosphere Reserve", as well as the scientific journal "Nature of the Carpathians: Scientific annual journal of the Carpathian Biosphere Reserve and Institute of Ecology of the Carpathians of NAS of Ukraine".

Today, the department of ecological education consists of six full-time staff members. However, the tasks of ensuring the ecological education, disseminating of knowledge about the nature, activities and functioning of the Carpathian Biosphere Reserve are implemented by almost all structural units of the reserve. In addition to the Department for ecological education, the leading place in this direction is occupied by the Museum of Mountain Ecology and History of Nature Management in the Ukrainian Carpathians, the editorial and publishing department of scientific and popular-science publications etc. Since 2010, the field divisions of the reserve are active participants of the ecological and educational process. Taking into account the cluster structure of the protected

area, the involvement of the specialists working at field divisions of CBR in the eco-educational process has helped us to yield a rather positive result. Already in 2010 the administration of the Carpathian Biosphere Reserve and administrations of secondary schools from the area of CBR's location signed 19 cooperation agreements on ecoeducation, and then 6 more in 2018. So, totally there are ca. 40 agreements of this kind. This measure made it possible to more actively involve employees of different structural units in the ecological education activities of the institution and to expand the territorial boundaries and thematic range of environmental education activities. Cooperation agreements helped to organize environmental events, eco-education activities in the systemic way, and could thus take the environmental education of students and youth to a new, more advanced level.

A wide network of educational outlets contributes to the eco-education activity. No doubts that the Museum of Mountain Ecology and History of Nature Resource Management in the Ukrainian Carpathians is the first and most important of them. Located at the central office of the reserve, it not only has the largest exposition with various exhibits, but is also the most visited center of the reserve. The Museum of Mountain Ecology began its work in the second half of the 1990s. In the following years, the institution created a harmonious system of information and educational centers. The intensification of efforts to develop the information and tourism infrastructure was largely stimulated by the adoption of a number of government documents, among which the special place is taken by the Presidential Decree No. 611 dated on August 14, 2009 "On additional measures for the development of nature reserves in Ukraine". It should be noted that there are two types of centers – eco-education (in general 3) and tourist information (4) ones. The difference is, first of all, in the tasks that are set for them, and is revealed in the complexity of the exhibitions and the premises of the center, and the presence of a special team that organizes the work.

The Museum of Mountain Ecology and History of Natural Resources Management in the Ukrainian Carpathians acts as an environmental education and recreation center. Its exposition includes two sections – "Nature of the Carpathians" and "Natural



Resources Management in the Ukrainian Carpathians", where we find 8 large-format dioramas, a number of mini-dioramas, three-dimensional models, art panels and more. The exposition is complemented by the rich geological, paleontological, archaeological collections, faunistic exhibits, household items, agricultural and forestry tools, instruments of labor, clothing models of the Ukrainian dwellers on the mountain-heights, etc.

The first eco-educational center, was established already in the third millennium (2006). It was the Museum of Narcissus. It is located at the entrance to the Narcissi Valley protected massif, and its activities are significantly connected to the flowering period of the Narcissus Valley. The exhibition area is about 112 m<sup>2</sup>. There is a video room with 50 seats for visitors. The decoration is quite simple, designed in a concise style. The main exhibit stands are information boards and showcases. The thematic field of the eco-educational center is biodiversity, history of research and protection of the Narcissus Valley; biology and ecology of the species of *Narcissus angustifolia*.

Educational activity of the ecological and educational center "Museum of Narcissus" is extremely important, because it is the only eco-educational structure within the Khust district of Zakarpattia region, which contributes to the Carpathian Biosphere Reserve's image formation. Mass visitation of the Museum

of *Narcissus* coincides with the flowering period of the *Narcissus angustifolia*. In May, this eco-education center receives between 10 and 20 thousand of visitors, which is about 90% of its annual visits. A slight increase in tourist visits is also observed in the period of the early spring species mass flowering – spring snowflake and *Crocus heuffelianus*. It is worth mentioning here that the interest to the blooming early spring species here is the result of the efforts of the staff of this field division and the eco-educators of the reserve. Since 2012, special promotional excursions have been held here to promote the idea of early spring species protection. However, excursions during the mass flowering of the first spring flowers are not as attended as the ones May.

Eco-educational center "The Center of Europe" has been functioning since June 2010. The main tasks of it include: reception of tourists and conducting excursions; to act as a tourist information center of the European model; active environmental education activities (organization and holding of environmental and educational events both on the basis of the center, as well as on the basis of secondary schools and kindergartens).

The information center "The Center of Europe" consists of four blocks – protected areas of Ukraine (most of it is devoted to the Carpathian Biosphere Reserve), Zakarpattia Hutsul Land, Transcarpathia and Ukraine in the



**Ukrainian-Romanian ecological event "Clean Ukraine" (on clearing the border segment of Tisza river banks), 2010; official opening of the tourist information center "Carpathian Highlands", 2011**

European community. Also, each visitor can get information about the history of the sign denoting the Geographical Center of Europe. The design of the center is made in Hutsul style: wooden elements, embroidery and stained-glass windows. The exhibit is quite diverse: collections of Hutsul dishes, embroideries, carvings, and mini-dioramas "Animal World of Transcarpathia" are presented next to the information modules. The most impressive is the artistic decoration: woodwork, embroidery and stained-glass panels. Additional elements are: video equipment, tables for ecoeducational classes and workshops etc.

Ecological education centers combine the informative function with active eco-education and awareness-rising activities.

All ecological education centers of the reserve provide excursion services not only indoors, but also along ecotourism hiking trails laid close to them. In order to accomplish their tasks, a team of 1-4 people is provided for each of them to reach a larger audience and effectively organize activities within the Biosphere Reserve's territory. This is of particular importance because of the location of CBR protected massifs in the 4 administrative districts of Zakarpattia.

All visitors have an opportunity to watch videos about Zakarpattia natural and cultural heritage, which are displayed in the halls of the center on a permanent basis.

CBR Tourist Information Centers are the following: Keveliv (Kvasy village), Carpathian Trout (Trybushany field division, Kostylivka village), Carpathian Highlands (Chornohora mountain range, upper altitudes) and Carpathian Primeval Beech Forests as the UNESCO World Heritage Property (Mala Uholka village, Uholka field division). They were created during the period from 2011 to 2015. On July 7, 2011, on our professional holiday – Day of Nature Conservationist of Ukraine – the official opening of the Carpathian Highlands Tourist Information Center (TIC) was held at the foot of the highest peak of Ukraine, Hoverla Mt., in the Chornohora massif of the Carpathian Biosphere Reserve. Here also operates a shelter for hikers with a capacity of 29 beds. There is a place for tents, water supply, toilets and trash cans. These factors have created favorable conditions for hikers, so they can stay here overnight, as well as for organizing environmental summer camps.

The area of the tourist information center, where the exposition is located, equals to 146,21 m<sup>2</sup>. The main exhibits are information boards in an authentic artistic framing made of natural materials. The thematic direction is defined by the location of the given TIC and is focused on the natural and cultural values of the highest mountainous part of Ukraine – the Chornohora mountain ridge of the Ukrainian Carpathians and the Hutsul Land.

The Carpathian Trout tourist information center (S – approx. 110 m<sup>2</sup>) and Keveliv (S – 58,2 m<sup>2</sup>) are the smallest information centers of the Carpathian Biosphere Reserve. One of the exhibition rooms of the Keveliv ITC consists of two information levels, highlighting the natural resources of the highest ridges of the Ukrainian Carpathians – Chornohora and Svydovets. The information is presented mainly as art works (paintings etc.). The center was opened in 2011.

The tourist information center "Carpathian Trout" is located on the territory of the demonstration trout farm (Trybushany field division), functioning since January 2012. Its main theme is covering the richness of the ichthyofauna of the Ukrainian Carpathians and the water resources of the region. The main exhibition elements are information boards. The decoration is laconic, made in the Hutsul style using exclusively natural materials. It is visited mainly in conjunction with a tour to the demonstration trout farm.

"The Primeval Beech Forests of the Carpathians as the UNESCO World Heritage Property" is a tourist information center opened in 2015. The exposition is arranged on an area of 65.12 m<sup>2</sup>. Thematic focus – primeval beech forests: conservation, values, biodiversity and more. The decoration is distinguished by the style inherent in the Carpathian ethnic groups living in the Tisza River Valley. Natural materials are used here; the picturesque views of the Krasna mountain range are framed in wood. The main exhibition elements are information boards and photo panels. Particularly interesting in terms of art is the video room, the design of which creates the illusion of being in a thick primeval beech forest. This effect is achieved thanks to the specific design – the walls and ceiling are completely covered with large-format banners with different types of beech virgin forest of the Uholka-Shyrokyi Luh massif.

Having an advanced network of information centers allows us to work with the visitors more effectively. Their

additional function is to organize a variety of ecological activities, but mostly they are aimed at tourists. However, it does not always maximize the effectiveness of working with other focus groups – especially with pupils, students, local communities.

It should be noted that the best-organized activity at the Carpathian Biosphere Reserve is collaboration with schools in the sphere of ecological education. It is carried out using various methodological forms and means. In order to maximize the effectiveness of eco-educational work and to correctly determine the methodological forms of this activity, the age groups have been defined, which, in particular, can be grouped as follows: pupils from preschool educational institutions; elementary school students (1-4 grades); middle school students (grades 5-8); high school students (grades 9-11).

The basis for the organization of eco-educational activities for children of preschool and primary school age is made up by the principle: "A man is formed at childhood". It is extremely important for eco-educators of any protected area to carry out ecological education for the children of this age group in close cooperation with the preschool teacher, who is a real expert in teaching methods, and understands the personal properties of children. In our opinion, the most effective forms of eco-education for the preschoolers from the point of view of the educational process are the following:

ecological games and fairy tales, simple practical classes, and short performances. In this case, the lessons last only 15-20 minutes, but require careful (and sometimes many-hours-long) preparation: development and production of manuals, learning the methodology, familiarization with the experience of preschool teachers. For example, in celebration of World Water Day, local preschools hosted classes where eco-educators made a presentation in the form of an ecological fairy tale. The practical training was simple and at the same time entertaining and instructive – on two identical models of a reservoir the children placed images of living organisms (plants and animals) and household waste. In this way, the concept of a clean pond and a littered one was formed; attention was paid to the importance of preserving our watercourses in their natural, unpolluted state.

Ecological education and upbringing of young children has many features in common with working with preschoolers: similar methods are used, simple but interesting tasks for the age group are applied, work is carried out in constant and close contact with a teacher and others. However, the tasks become more complex and the classes last longer.

The most interesting experience of conducting ecological events with young children is the eco-demonstration organized by the ecoeducators of the reserve in the center of Rakhiv annually (since 2010), within the framework of

the All-Ukrainian action "Pervotsvit" (early flowering plants). The younger students walk with banners "Save the early flowering plants!" along the central street of the town and near the building of the Town Council, and show a performance on the preservation of early-flowering species for the residents of Rakhiv – recite poems, sing songs, urge the citizens of our town not to buy early spring wild flowers from street vendors, hand out information flyers etc. The event lasts for about 20 minutes, but enjoys considerable attention among the residents of Rakhiv: people leave their affairs and stop by to listen to children's presentations, to discuss the problem of nature protection etc. The attention of the locals is attracted by the children's attire (all participants are dressed in snowdrop costumes – white capes and petals), which are also made by children (students of the 8<sup>th</sup> grade) at the lessons of arts and crafts.

Junior students are also involved in other environmental events and activities. An interesting form of ecological education that brings together younger school and kindergarten groups is short ecological performances, where young students are invited in the role of actors, and kindergartens are the audience. In particular, eco-educators of CBR held such events on different topics and within the framework of various environmental events – "Water is the source of life", "Wintering birds", "Bird feeders" and others.

Children of this age group are active participants of art contests organized by the Carpathian Biosphere Reserve annually, even several times a year, which have various topics: "let's save early-flowering plants!!", "Narcissus is singing its song of spring", "Carpathian animals", "Carpathian nature" and many others.

The practical tasks for these age groups – i.e. junior school students and pre-schoolers – are also an important component of environmental education and upbringing.

Hand-made creative products produced by children are proudly demonstrated by them to parents; they happily share their experience, and sometimes make comments about the behavior of the adults, because it no longer fits into the model of their environmental thinking. This makes it possible to indirectly influence the adults' consciousness and make it more ecologically-friendly.



Participants of an ecological performance "Let's Save Mother-Earth!", 2015



**Victoria BUNDZIAK,**  
*Manager of the Department  
for Ecological Education  
of CBR*

1. The most important achievement of the Carpathian Biosphere Reserve is its repeated international recognition. At the same time, CBR has a huge responsibility to all humanity and its descendants. Our insignificant compared to the whole area part of the biosphere should be preserved and passed on to future generations in a decent state. Under the today's conditions, this task is very difficult to implement. Environmentalists are constantly facing new challenges and new ecological threats. And it is also a situation that is typical for nature conservation at the global level, which, again, makes the Carpathian Biosphere Reserve part of the global process of preserving the Earth's biosphere.

3. The directions of work of the Carpathian Biosphere Reserve are quite diverse and cover all major areas. However, some of them may need to be enhanced or activated. Here I would include recreation development in the broad sense. It is not just about the work of recreation professionals. A decent, welcoming reception, convenient infrastructure for hikers, well-maintained network of roads and trails are what shape the image of the institution far beyond. Every visitor should bring home only the admiration for nature, its beauty and uniqueness. And everything else should be left behind-the-scenes. This

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is, of course, very important, but it also requires a complex approach and the coordinated work of many structural units and specialists. Fundraising also requires a thorough approach – finding additional sources of funding is important. This area of work is one of the most significant for the European and American protected areas, because it allows performing tasks that are usually underfunded from the state budget, or vice versa, to perform some experiments, to be creative. Unfortunately, the Carpathian Biosphere Reserve cannot boast of great achievements in this respect. We do not even have specialists who are able to consistently and professionally write projects, and submit them to the donors on a regular basis, or track the activities of foundations and, finally, receive funding and realize the plans.

4. The advantages of being a Carpathian nature guard for the Carpathian Biosphere Reserve as an institution, are the successful completion of the tasks set to us by the national government.

The disadvantages are misunderstandings and small conflicts that occasionally arise. For example, with local communities, entrepreneurs, nature resource users. It is not always the case that entrepreneurs are willing to think first of all about the environmental protection, and only then – about their business interests, and a local resident cares about heating his house and, accordingly, firewood is his first interest, and not preservation of the beech forests. These and other examples are considered to be the conflicts of interest. They have arisen in the past arise now and will arise in the future. They can hardly be attributed to the real disadvantages. In general, the reserve successfully solves these tasks and avoids major conflicts. That is, it's just part of the job, though not the most enjoyable one.

Regarding the pros and cons of the Carpathian environmentalist on a personal level. The realization of the fact that working for the protection of one of the most beautiful and unique places on the earth you are involved into something global and truly important for you personally, your children and your grandchildren, all the countries

and even all of humanity – this gives great pleasure! And sometimes it is not easy. Often, you are not understood by others, like your neighbors and friends. And deep inside each of us, dedicated employees of the reserve, knows that the work we do daily is really important.

5. Personal victories consist in the conviction that in my life I am engaged in what I consider to be really important. The future plans – a series of small victories in my professional career. There's a wish to improve and update information along our hiking and ecological trails, update individual elements in the visitor centers, and to equip them with interactive elements.

6. During the 20 years of my career at the reserve, many events have become unforgettable, and most of them are painted in bright, cheerful colors. Field trips with colleagues, work at the Eukos Ecological Camp and the Tisza catamaran rafting, joint celebrations of the institution's anniversaries and the professional holiday – Day of Conservationist of Ukraine, capacity-building courses in Kaniv and Kyiv, conferences, round-table meetings – too many of them to be named here! However, the most striking event, perhaps, I consider to be an internship in the United States under the program "Museum Affairs". Those were more than three weeks, filled with new experiences, acquaintances, reviews of museum exhibitions and, of course, culture shock from another environment, completely different from the Ukrainian one.





Middle-school students (grades 5-8) form the largest and most active target group for ecological education among schoolchildren.

In this direction, the Carpathian Biosphere Reserve has taken a successful step by concluding Agreements on cooperation in the field of environmental education and upbringing of schoolchildren with most of the secondary schools in its area of activity. It allows organizing cooperation effectively, to attract a larger audience to educational and practical environmental activities. The institution's administration also fosters educators' interest in expanding and fostering collaboration. Thus, in 2016, ecological classes, events and activities were developed and conducted for teachers who pay due attention to the environmental education of the youth; "Best Environmental Lesson" Contest was held to strengthen cooperation between public education institutions and CBR.

The secondary schools of the Zakarpattia Hutsul region took part in it. The organizers were the Carpathian Biosphere Reserve and the Department of Education, Youth and Sports of the Rakhiv Regional State Administration. Excursion to the Milk Stone Cave, acquaintance with the primeval beech forest of Uholka with its structure, ecological functions, importance for the continent's climate formation, species composition of vegetation will be remembered by participants forever.

CBR's eco-educators hold various events for the middle-school students. A considerable part of them is held on the basis of the educational establishments, and also thematic and general field trips to the massifs of the reserve, ecological-educational and tourist information centers are organized.

In general, a very broad group of educational methods is used for middle school students: lectures, explanations reports, stories, presentations, discussions in various forms – a round table, a press conference, a discussion, a forum, a student conference, etc. Such methods are always used indoors – in the classroom, in



**Pupils of the Club "Junior Forest Rangers – Rakhiv", 2018;  
Carpathian Snowman – an environmental campaign, 2012;  
Entomologist's Day at CBR's central office, 2011**

the assembly hall of a secondary school or in the conference room of the reserve and in the conference rooms of the eco-education centers.

Among the interactive activities we can name performances on ecological topics, flashmobs and more. Often, the actors who have prepared the eco-performance demonstrate it not only to the students from their school, but also to other pupils from neighboring town schools. However, this practice is applied only in the center of the Transcarpathian Hutsul region – the town of Rakhiv, where there are four secondary schools. In rural areas, however, there is usually only one school, and performances at other educational establishments are complicated because of organizational arrangements. Occasionally, children's performances are also held at the central office of the reserve for its staff members on occasion of different ecological events, or to mark the next anniversary of the institution, during conferences or official opening of a new information and educational center, etc.

In the natural environment – protected massifs of CBR, or along the ecological hiking trails and ecotourism routes – we organize thematic excursions, practical classes dedicated to the species composition of CBR's flora and fauna, the ecosystems and biotopes of the reserve and so on. Here a special role is given to the botanical collection plot and the arboretum, which are located around the central office of the reserve. The proximity to the settlements, the availability of scientific laboratories, the presence of the Museum of Mountain Ecology and other infrastructure create here a favorable platform and generate educational interest. However, the main role here, of course, is played by the presence of a rich live collection found in the arboretum, and an experimental nursery of ornamental and fruit crops. Every year, in late May – early June, a number of educational activities and thematic excursions is organized: Flora Day, Entomologist's Day, Bird Day, Forest Day, Water Day. During these activities, students, guided by the scientists of the reserve, study the nature of our Homeland: the species composition of meadow vegetation, the arboretum and adjacent forests, rock gardens; they also search for nests, study the species composition of birds, learn to identify

them by singing and how to ring them; children try to identify pH of water from the nearby mountain stream and many more interesting things. Researchers from the Botanical, Zoological and Forest research laboratories prepare interesting stories for the students, select objects of study for every field trip, demonstrate them botanical and zoological collections and live objects. The eco-monitoring laboratory diversifies the curriculum of the school activities by showing them the chemical equipment, conducting simple analyzes of water from the river and mountain streams. The presence of a seismic station in the territory of the arboretum, which belongs to the Carpathian Department of the Institute of Geophysics NAS of Ukraine allows us to hold the Seismologist's Day, when children can have a look at seismic sensors, get acquainted with the principle of their work and data collection system, learn about the types of earthquakes and their causes, what not.

There are also educational and entertaining ecological events held at the central office. A quest on coniferous tree species, a tourist quest, an event on joint clearing of a mineral spring and an ecotourism route that leads to it, a quest "Find fern flower!", ecological games – these are but a small part of educational and entertaining events that took place in the territory of the arboretum and the botanical collection plot in 2017. They enjoy an especially great popularity during school holidays. Game techniques allow you to

make the learning process unobtrusive, spontaneous and, most importantly, fun and effective. Excursions with nature interpretation help to clarify important things for students (often difficult to understand) by influencing their psycho-emotional state. Methods of interpretation and "forest pedagogy" are gaining popularity in Ukraine only now, but our experience in using them is very effective.

Middle school students are active participants in many environmental events that are held in a remote manner, especially the competitions and contests: on the best ecology-themed essay, on an eco-poster (for example, "Earth Hour", "Carpathian Biodiversity", "First Spring Flowers – Messengers of Spring", "Let's Save the Carpathian Forests" etc.), contest of drawings or items made of recycled materials, etc. It should be noted that art contests are organized by the reserve, with a focus on both middle-aged and younger students. However, different age groups are evaluated in different categories, or separate contests are held for them. Among the activities held in a remote manner there are interesting forms of work, such as environmental quizzes, many of which are focused on the nature of the Carpathian Biosphere Reserve. The quizzes are usually conducted in several stages, their tasks and correct answers are printed in the local press (in particular, an effective cooperation has

## Ecology-themed event "Earth Hour" in Rakhiv, 2017



developed with the district newspaper "Zoria Rakhivshchyny"/Rakhiv District Star). The quizzes "45 years on guard for the Carpathians" (to the 45<sup>th</sup> anniversary of the reserve), "Earth is our common home" (to the World Earth Day), "The Carpathian Biosphere Reserve: history, nature, and protection" (to the Day of the Reserve).

Children of this age group are also active participants of clubs and children groups – either permanent or temporary. For example, in 2016, "The Junior Forest Rangers – Rakhiv Club" was established on the basis of Rakhiv Secondary School # 1. This school team has appeared thanks to the project "Junior Forest Rangers", funded by the US Forest Service International Programs. As a result of the call for project proposals conducted by the charitable foundation "Center for Public Initiatives", the project application of Rakhiv Secondary School # 1 was supported and won the call for project proposals. The Carpathian Biosphere Reserve and the Rakhiv Experimental State Forestry Enterprise are the partners within the project implementation. Classes are held regularly, on weekly bases. Most of them involve eco-educators and conservationists. "Junior Forest Rangers" are permanent participants of environmental quests, performances, practical nature conservation activities, flashmobs and other ecoeducational activities organized by the reserve.

Schoolchildren (grades 9-11) are one of the focus groups of the ecoeducational work of the Carpathian CB. Children of this age group already see themselves as future university students and need more serious work methods. Here, the main educational methods are lectures, discussions, research projects, as well as individual work under the program of the Small Academy of Sciences, preparation for the Olympiads (nation-wide knowledge contests), various ecology-themed competitions at the regional and national levels. Dealing with this age group requires thorough training, more in-depth knowledge, and significant time resources.

The Carpathian Biosphere Reserve also organizes environmental events and

eco-education activities that cover all age groups of schoolchildren, preschoolers, and the adult population. Among them, in particular, should be noted the events on planting young trees and bushes. Often, they are held in April – to mark the All-Ukrainian Environment Day, or in October-November – to celebrate the Day of the Reserve (November 12). We use our own planting material, which is grown in the experimental nursery of decorative crops. The municipalities of local villages, schools, including kindergartens, are enthusiastically planting these seedlings in their yards.

One of the first mass events was the March of Parks. This event is a worldwide and quite well-known among nature conservationists, which came to Ukraine in 1996 and immediately the Carpathian Biosphere Reserve became its local organizer. However, the Marsh of Parks did not gain much popularity with the locals. Instead, the Earth Hour, which has been first held in Rakhiv in 2011, gathers several hundred people each year on the central square of Rakhiv on a Saturday evening in March.

A special place in cooperation with schoolchildren ecological summer camps are worth mentioning. For over 20 years, since 1993, the All-Ukrainian Ecological Tent-Camp "Eukos" is being held on the territory of the reserve. It gathered young naturalists from different parts of Ukraine and was organized jointly with the Transcarpathian Regional Ecological and Naturalistic Center. The Eukos program was very busy. For three weeks the

young people were visiting the natural ecosystems of the Chornohora, Uholka and Kuzyi-Trybushany protected massifs, they also went rafting on the Tisza River on catamarans, were exploring the Carpathian highlands, the river network, and the flora and fauna of Zakarpattia. In 2008, together with Peace Corps volunteer Theodora Campbell-Orde, who had been living and working in the village of Kostylivka of Rakhiv district for 2 years, a week-long ecological tent-camp was held for local schoolchildren on the basis of the Kuzyi-Trybushany massif of CBR. In some years, the reserve organized two-week camps for the Plast students – both for the local ones and from other regions of Ukraine. For the last 4 years, the ecological camp "Polonyna Summer" has been operating on the basis of the Chornohora Mountain Massif. Its participants are schoolchildren under the age of 15. The program includes environmental classes, elements of patriotic education, travel skills, etc.

Every year, students from many universities of Ukraine and from abroad take part in internships held at the Carpathian Biosphere Reserve. The students of the geographical, biological, forestry and environmental faculties and departments of various universities use the ecosystems of the reserve as natural laboratories. Active cooperation with university students in the frameworks of their internships usually begins in May and lasts until August. Field trips, work on permanent sample plots, learning the working mode of the Carpathian Biosphere Reserve as a research, environmental, and



**Eco-games with ecology students from the National University of Transport in the Narcissi Valley, 2018**



ecoeducational institution, lectures held by scientists, and thematic excursions are the main bullet points of the internship curriculum ensured by the reserve's staff. The natural ecosystems of the protected area almost every year are studied by the students of Uzhgorod, Lviv, Chernivtsi National Universities, the Kirovohrad State Pedagogical University named after V. Vinnychenko, the Ternopil National Pedagogical University named after V. Hnatyuk, the Precarpathian National University named after V. Stefanyk.

In July, the ecology students of the National University of Kyiv-Mohyla Academy (2<sup>nd</sup> year course, Faculty of Natural Sciences, specialization – ecology and environmental protection) are traditionally having their internship at CBR. Researchers work as teachers, trying to pass on their knowledge to a new young generation of professionals who will work in the field of nature conservation and scientific and environmental research.

The students are introduced to the specifics of protected areas in Ukraine. At the same time, practical work is being carried out combined with the theoretical classes, student trips are organized to the massifs of the Carpathian reserve, in particular in the highlands of Chornohora, to the primeval beech forests of the Uholka-Shyrokyi Luh massif, the trout farm of the Trybushany field division, or to the Geographical Center of Europe. Students also get acquainted with the exhibits and the work of the eco-educational centers of the reserve.

Since 2006 the students of the Faculty of Forest Ecosystem Management from the University of Sustainable Development, Eberswalde, Germany, have their regular study tours here.

German students study local forest management experience and track the impact of global change in the region. Much attention is traditionally paid to the environmental and socio-economic situation in our country, the problems of preserving cultural and historical heritage, traditional nature management.

The agenda of the practical field trips is always finalized with a summarizing seminar.

Therefore, ecological education of schoolchildren and university students in the Carpathian Biosphere Reserve is very diverse in terms of forms and methods of work, and has a systemic character.

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



***Elvira ANHER,  
leading specialist  
of the Department  
for ecological educational  
and awareness rising  
of CBR***

1. In my opinion, CBR plays a significant role in the global conservation process, as it preserves unique wilderness areas of Europe, including highly valuable primeval beech forests, and rare and endangered species of plants and animals.

2. The most important achievements of the reserve include the inclusion of CBR in the UNESCO MAB World Network of Biosphere Reserves, being awarded with the European diploma, which the Council of Europe has repeatedly renewed, and the inclusion of CBR's primeval beech forests in UNESCO World Heritage List. It should also be noted that CBR actively cooperates with territorial communities, publishes its own printed products and disseminates information to the population in the mass media and via the Internet.

3. I believe that CBR does not need to create new work fields, but it is necessary to further develop the existing ones.

4. The main mission of CBR is to protect and conserve the environment, limit mass deforestation, prevent hunting for rare species of animals, control waste management within its territory.

5. My own achievement is working for the ecoeducation department, which I enjoy so much, because communication with children and young people in the educational process is a lot of fun. In the future I plan to continue to do my favorite activity and try to involve as many young people as possible in the environmental protection process.

6. Due to the fact that I don't work long enough at CBR, I cannot recall many memorable events related to the activity of the reserve, but everything is still ahead...



## ECOLOGICAL-TOURIST PATRIOTIC FIELD SCHOOL "POLONYNA SUMMER"

The event was attended by 15 pupils of 5-10 grades of Rakhiv secondary schools, most of whom were members of the tourist club. The tourism information center of CBR – the Carpathian Highlands – located in Peremychka tract (the saddle between the two highest peaks) at the foot of the highest peak of the Ukrainian Carpathians, Hoverla Mt., was chosen as the venue for the camp. The field school was held under the guidance of Ihor Kalba, manager of the Museum of Mountain Ecology, also Victoria Bundziak, manager of the Department for Ecological Education, and her deputy – Ivanna Kolachuk, and a geography teacher from the Rakhiv Secondary School No. 2 Anton Vizaver, who is also the head of the tourist club.

**Official opening of the camp:  
heart-warming sounds  
of the National Anthem of Ukraine**



***Ihor KALBA,  
Manager of the Museum  
of Mountains Ecology and  
History of Nature Management  
in the Ukrainian Carpathians***

The purpose of the field school was to improve the children's state of health, to give them knowledge and skills of terrain orientation in azimuth, to teach how to make fire and to put tents. And additionally, they had a chance to study soils, landscapes, flora and fauna of the highlands, to hike Hoverla and Petros mountain peaks.

A lot of preparatory work has been done for the field school to take place. It was not the first time that the ecology-themed events of the reserve were supported by the council members and the mayor of Rakhiv – Mr. Victor Medvid. And once again the Rakhiv Town Council purchased the equipment



(four tents, 16 sleeping bags, 16 carimats, two LED torches, a mobile shower), they also financed catering and transfer of the field school participants.

The national anthem of Ukraine and the raising of the national flag marked the start of the official opening of the field school. Victoria Bundziak delivered a short lecture on the activities and tasks of CBR, and told about the rules of conduct in the protected area. Each participant received a blazer with a logo of the field school that had previously been purchased by CBR.

The daily program of the field school was rich and interesting. After the camp was opened, the participants took part in a sports orienteering competition. Three teams actively fought for the victory. All the participants of the teams coped with the task, and they received awards and certificates.

The next day, there was a difficult task for the participants of the field school – climbing to Hoverla Mt. In spite of difficult weather conditions (strong wind, fog and rain), all the students conquered the highest peak of Ukraine. They were tired, but happy. Then they kids warmed themselves up with the Carpathian herb tea and exchanged their impressions with each other.

Unfortunately, the weather still made adjustments to our plans and made climbing to Petros Mt. impossible. On the third day, the camp leaders organized a small scientific conference on the topic "Construction of the Svydovets Ski Resort – Benefits and

Threats". The participants were divided into two teams: "Developers" and "Environmentalists". After three hours of active preparation, the "prosecutors" and "attorneys" met at the public hearings. "Developers" argued in favor of construction of the resort as an opportunity to create jobs, showcase alpine sheep farms and development of tourist infrastructure in the region. Environmentalists, however, were concerned with the huge recreational pressure on the highland ecosystems, which can lead to the disappearance of rare highland and lowland plant species, large water intakes for tourists' needs, littering around and alteration of high-altitude lakes, and active logging. As a result, the developers agreed to build the resort, observing environmental norms and standards under the supervision of environmental activists. Environmentalists, however, insisted on the development of green tourism and the conservation of the Carpathian nature. At the end of the conference the children participated in the ecological games organized by Ivanna Kolachuk.

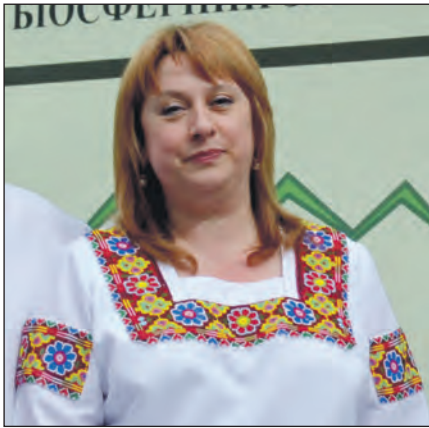
Our field school ended with sporting aerial rifle shooting at the targets and incomplete disassembly and assembly of AK74 assault rifle. All the participants, including girls, performed well.

The participants of the field school received certificates of climbing on Hoverla Mt., and the winners of sports competitions were rewarded with diplomas.

The first field school was a success! Dishes cooked on fire, crystal clear water from mountain streams and outdoor activities will forever be remembered by the children. We hope that all the participants have got some good impressions and that the camp will be an annual event.



Short lecture about the activity and the objectives of CBR and the rules of conduct in the protected area; from left to right: the leaders of the field school Ihor KALBA, Ivanna KOLACHUK and Anton VIZAYER; before the dinner cooked by children



*Natalia KALBA,  
Specialist of the Museum  
of Mountain Ecology  
and History  
of Nature Management  
in the Ukrainian Carpathians*

**A**t the central office of the Carpathian Biosphere reserve, located in Rakhiv, there's the only in Ukraine Museum of Mountains Ecology and History of Nature Management in the Ukrainian Carpathians. Created in the 1990s, today it has become one of Zakarpattia most famous tourist sites.

The idea of creating the Museum belongs to the Doctor of Biological Sciences, Professor F.D. Hamor.

In the late eighties, a group of CBT workers led by F.D. Hamor visited the Karkonosze National Nature Park. A visit to the Life and Stone Museum was also included in the program. Inspired by the things seen, the idea of creating a unique museum emerged.

Later, a group of scientists of the reserve, composed of Vasyl Pokynchereda, Yaroslav Dovhanych and an artist Yosyp Yahnyuk were sent to Karkonosze.

After their return, the meticulous work on creating an exposition plan with corresponding sketches and informational content of the future museum was carried out. The methodological and exposition plan was agreed and approved at the meeting of the Scientific and Technical Council of the Carpathian State Reserve and then started to be actively implemented.

## HISTORY OF THE MUSEUM OF MOUNTAIN ECOLOGY OF MOUNTAIN ECOLOGY



The first halls and expositions of the Museum were created by a group of contractors from the Luhansk Museum of Local Folklore under the direction of Nadia Sharkadina, as well as by local artists Pavlo Hodvan and Yosyp Yahnyuk. Later, a group of artists from the National Union of Artists of Ukraine (Kyiv) joined to the process of creating the first part of the Museum, namely: V.V. Kikinyova, K.V. Kasyanenko, L.O. Hurska. Subsequently, they became key authors of all the museum exhibitions. The main scientific and methodological consultations and design decisions belong to Vasyl Pokynchereda. Mykola Rybak, Dmytro Sukharyuk and Fedir Hamor acted as consultants for the creation of some thematic halls. Carpenter's works were performed by Yuriy Broisa and Ivan Bendyk.

The museum exposition, which covers more than a thousand square meters, consists of two organically combined sections – "Natural Ecosystems of the Carpathians" and "History of Nature Use in the Ukrainian Carpathians". Within the first section, the ecological point of view is given a on the history of the Carpathian Mountains, their geology, geomorphology, main types of landscapes, flora and fauna, as well as mountains in general

as peculiar natural phenomena. This section is supplemented by an aquarium complex containing an interactive model of a mountain stream, with characteristic aquatic and semi-aquatic inhabitants.

The second part of the exposition reveals the main directions of nature resources management in the Ukrainian Carpathians – from the early human settlements on these lands in the late Paleolithic period about 20.000 years ago, and to the present day. The uniqueness and originality of traditional mountain farming, forestry, agriculture, etc., which are an integral part of the cultural heritage of the Ukrainian Highlanders, is illustrated here.

Various exhibition forms and means were used to illuminate the subject of the museum. These are dioramas, simulations, models, panels, complex boards, panoramas, etc. that are filled with full-scale exhibits and artifacts. Among them there are rich geological, paleontological, zoological, archaeological collections, elements of folk life and culture.

The Museum is a venue for a variety of activities with students, tourists, locals, making it a true eco-educational and cultural center.

Every year, thousands of tourists from Ukraine and abroad visit the Museum.

We cordially invite you to visit the Museum of Mountain Ecology, located in Rakhiv, at the central office of the Carpathian Biosphere Reserve. The impressions from the visitation will remain in your memory forever!

**Expositions of the Museum of Mountain Ecology and History of Nature Use in the Ukrainian Carpathians, central office of the Carpathian Biosphere Reserve, Rakhiv**



## MOMENT OF TRUTH:

### QUESTIONARY ON OCCASION OF ANNIVERSARY



**Peter BRANG,**  
*Leader of a research unit of the Federal Institute of Forest, Snow and Landscape Investigations (WSL), Birmensdorf, Switzerland*

1. In my view, CBR plays a pioneering role in the conservation of terrestrial ecosystems, in particular – temperate forests. International cooperation was important for this role.

2. The highest achievement of CBR is the successful protection of the European largest sites of primeval beech forests. Another important achievement is that CBR has created an environment that allows continuous research activities in these forests.

3. CBR should start thinking about the effects of climate change on the primeval beech forests.

6. The most memorable event related to CBR was visiting some of the remote areas of the Shyrokyi Luh protected massif. Giant beech trees propping up the sky, lying deadwood – the atmosphere of this forest is like eternity, and it has touched upon me, leaving me deeply impressed.

After the establishment of the Carpathian State Reserve /Zapovidnyk/ (12.11.1968) purposeful and systematic research of the biodiversity of protected areas were started, the results of which were covered by numerous articles and monographs by scientists from many scientific institutions and establishments. In particular, in 1969 the register-book "Nature Reserves and Nature Monuments of Ukraine" was published (the authors – O.L. Lypa and A.P. Fedorenko), and the publication first mentioned the Carpathian State Reserve /Zapovidnyk/ [20]. In 1982, the popular-scientific edition "The Carpathian Zapovidnyk" and the monograph "Flora and Vegetation of the Carpathian Zapovidnyk" were published. The authors were S.M. Stoiko, L.O. Tassenkevych, L.I. Milkina and others. [35, 36]. And in 1997 a collective monograph entitled "Biodiversity of the Carpathian Biosphere Reserve" was published, which covered the results of years of research into the flora and fauna of the reserve's massifs [2].

During the 50-year period of the Carpathian Reserve's activity, its team published 25 monographs, 18 volumes of international scientific conference proceedings, more than 970 scientific publications and 41 volumes of "Chronicles of Nature", prepared 15 PhD theses, dozens of university diploma theses and case studies. Now we would like to dwell only on some important scientific works, since the detailed generalized information about the list of publications of the reserve's staff members is reflected in the first and the second edition of the bibliographical reference [18, 19].

To the 20<sup>th</sup> anniversary of the Carpathian State Reserve, a scientific conference was held and a collection of abstracts was published – "Problems of protected ecosystems research and conservation" [31]. During this period, other scientific collections were published by the institution, in particular "Scientific research in nature reserves and principles for developing regional programs for nature reserves in the European part of the USSR" [25] and "Socio-ecological, economic and legal aspects of protected area system development in Ukraine" [34].

In 1993, the reserve organized the International Scientific Conference, dedicated to its 25<sup>th</sup> anniversary, and conference proceedings entitled "Ecological foundations for the optimization of protection regime and nature management within protected areas"



**Fedir HAMOR,**  
*Deputy Director of the  
Carpathian Biosphere Reserve,  
Doctor of Biological Sciences,  
Professor, Honored  
Conservationist of Ukraine,  
Member of the National  
Commission of Ukraine  
for UNESCO*

[9]. The following year, the first issue of the all-Ukrainian ecological popular-science magazine "Green Carpathians" (Zeleni Karpaty) was published, co-founded by the Carpathian Biosphere Reserve and the Ministry of Ecology and Natural Resources of Ukraine [16]. Thanks to the magazine, the institution was able to widely inform the population about its activities, environmental events and nature conservation in the Carpathian region, the problems of protection and use of natural resources, as well as to disseminate environmental knowledge, to shape the ecological culture of the readers. It should be emphasized that the magazine is now one of the most respected ecological publications in Ukraine.

Later on, an international scientific conference dedicated the 550<sup>th</sup> anniversary of the town of Rakhiv was held on the topic "International aspects of the Carpathian biodiversity research and conservation", and a volume of conference proceedings was published [24]. To the 30<sup>th</sup> anniversary of the reserve, an international scientific conference was organized and held on the topic "Carpathian region and sustainable development problems", and two volumes of proceedings prepared by scientists from the Carpathian Euroregion were published [21, 22]. In the conference proceedings, the main focus is given to the concept



**Bohdana MOSKALYUK,**  
*Manager of the editorial-  
publishing department  
for scientific  
and scientific-popular  
publications,  
PhD in biological  
sciences*

of sustainable development as well as to the issues of international cooperation, environmental education and awareness rising, the role of the public and local authorities in addressing sustainable development issues. Great part of the proceedings related to the environmental and socio-economic situation in the Carpathian region. The following year a similar conference was held and a volume of proceedings was published on the topic "Ecological and socio-economic aspects of catastrophic natural phenomena in the Carpathian region (floods, mudflows, landslides)" [12]. The volume of proceedings illustrates the role of natural and anthropogenic factors in the emergence and intensification of natural phenomena, as well as patterns of their occurrence. The consequences of the natural disasters and measures for their prevention are discussed in detail. Much of the material relates to the ways of forming the Carpathian Regional Ecological Network and the optimization of protected areas in the Carpathian region. Particular attention is paid to international cooperation and the role of the public and local authorities in preventing and eliminating the effects of natural disasters.

In the beginning of 2002 the team members of the reserve became more active in preparing scientific works. In

# PUBLISHING ACTIVITIES OF THE CARPATHIAN BIOSPHERE RESERVE:

## HISTORY, CURRENT SITUATION AND PROSPECTS

particular, two volumes of the international conference proceedings "Mountains and People (in the Context of Sustainable Development)" were published [6, 7]. These collections of scientific papers show various aspects of the sustainable development of mountain areas. The first volume deals with the socio-economic problems of the highland territories and the mode of balanced use of natural resource potential of the mountains, and the second one presents articles on the issues related to the prevention of natural calamities in the mountains and mitigation of their effects, as well as the detailed analysis of the biological and landscape diversity conservation problems within the mountainous territories.

In 2003, an important scientific publication "Natural Forest in the Temperate Zone of Europe – Values and Utilization" was issued in Switzerland [30, 39]. This collection of scientific papers deals with the problems of structure and dynamics of primeval and natural forests. A particular attention is paid to breaches of biodiversity conservation regime, as well as the protection and management of natural forests. In the published work the analysis of the role of primeval forests for the introduction of close-to-nature forestry and conservation of biodiversity is presented, the socio-cultural and socio-economic importance of the natural forests is highlighted. A guidebook to the forests of the Carpathian

Biosphere Reserve "Primeval Forests in the Center of Europe" was published the same year [27]. The guidebook is a product of collaboration between the two partner research institutions. Subsequently, an important monograph by Dr. Vasyl Chumak "Aphids of the Ukrainian Carpathians" was published [38].

In 2005, a compilation of materials of the international conference "Ecological and socio-economic aspects of ethno-cultural and historical heritage preservation in the Carpathians" was published [11]. The preparation and publication of the conference proceedings were financially supported by the Swiss-Ukrainian Project on Zakarpattia Forestry Sector Development (FORZA). The materials of the volume of proceedings cover the problems the ethnic-cultural and historical heritage protection in the Carpathians. Various aspects of the spiritual and cultural

values formation among the people dwelling in the highland territories are revealed, the importance of protected areas and the Framework Convention for the Protection and Sustainable Development of the Carpathians for these values conservation were covered herewith.

Starting from 2006, a regional ecological newspaper "Newsletter of the Carpathian Biosphere Reserve" is published six times a year, and its founder is the Carpathian Biosphere Reserve [4]. The periodical covers all directions of the institution's activity. Important publications that were released the same year were: methodological guidelines to carry out works within the framework of the Ukrainian-Dutch project "Virgin Forests Transcarpathia (Ukraine) as core zones of the pan-European ecological network" (BBI-MATRA 2006-2007). [23] prepared by a group of authors: Fedir Hamor, Peter Vein,

Collection of scientific papers "Natural forests in the temperate zone of Europe – values and utilization"; monograph "Virgin forests of Zakarpattia"



Yaroslav Dovhanych, Dmytro Sukharyuk, Svitlana Zyman, Mykola Voloshchuk, a monograph by M.I. Bedei "Blyznytsia-Drahobrat (flora, vegetation, protection)" [1] and a volume of proceedings of the international scientific-practical conference "Problems of sustainable use of natural resources in the Carpathian region (ecology, education, business)" [32].

In 2007, the institution held an international scientific conference and published a volume of proceedings entitled "Ecotourism and sustainable development in the Carpathians" [13]. The volume of proceedings is dedicated to the problems of the ecological tourism development in the Carpathians as a component of sustainable development of the region. The impacts of ecotourism on socio-economic development, features of ecotourism management, and the problems of biodiversity conservation related to this activity are analyzed in detail, especially for the territories of protected area system of Ukraine. In addition, the same year a photo album "Invitation to the Ball of Spring to the Valley of Narcissi" was released, and its authors were V.I. Komendar, F.D. Hamor, S.Yu. Melnyk [15]. In the photo album, the pearl of the rich and diverse nature of Transcarpathia – a unique protected massif of the Carpathian Biosphere Reserve – the Narcissi Valley – was depicted.

Next year, to the 40<sup>th</sup> anniversary of the reserve, an international scientific conference was held with the financial

support of the Swiss-Ukrainian Forestry Development Project in Zakarpattia FORZA, the Danube-Carpathian Program of the World Wildlife Fund (WWF-DCP) and the NGO "Ecological Club Carpathians" on the topic "Development of nature conservation activity in Ukraine and formation of pan-European ecological network", and a volume of conference proceedings was published [33]. The materials of the volume covered the problems of the protected area system development and its integration into the pan-European ecological network. The organization of biodiversity monitoring, accumulation of scientific database as indicators of the effectiveness of ecological network formation and the role of eco-educational and tourist-recreational activities in this context were analyzed in detail. The same year the monograph "Virgin forests of Transcarpathia. Inventory and management" [28] was published with the financial support of the Government of the Netherlands. The monograph summarizes the results of the Ukrainian-Dutch project (BBI-Matra) on inventory and mapping of the Transcarpathian primeval forests. The history of protection and study of primeval forests, criteria and methods of their determination are considered. The distribution of primeval forests by types of stands, geo-botanical districts, land users, conservation status, basic orographic units, biodiversity composition, etc. is analyzed. Maps, geo-information database

structure, forest conservation strategy and the conservation action plan are provided.

In 2010, the monograph "Great yellow gentian (*Gentiana lutea* L.) in the Ukrainian Carpathians" was published [37], which provided materials on the distribution of the yellow gentian, information on the geo-botanical characterization of its groups, as well as ontogeny, reproduction, etc..

To the 45<sup>th</sup> anniversary since the designation of the reserve, in 2013, with UNESCO's financial support an international scientific-practical conference was held and the volume of proceedings "Primeval and ancient beech forests of Europe: problems of conservation and sustainable use" was published [3]. The volume is dedicated to the analysis of the problems of preservation and sustainable use of primeval and ancient beech forests of Europe. Their role in the conservation of biological diversity, their importance for mitigating the impact of global climate change, the introduction of environmental models of sustainable forest management and use for scientific, educational and ecotourism purposes were discussed.

In 2014, with the financial support of the All-Ukrainian Non-Governmental Organization "Association of Protected Areas of Ukraine", a scientific monograph "Narcissus *angustifolius* Curt. in the natural flora of Ukraine" was published [17]. Its authors are scientists of the Institute of Botany of the National Academy of Sciences of Ukraine and the Carpathian Biosphere Reserve: Doctors of Biology Svitlana Zyman and Fedir Hamor, and PhDs in Biological Sciences O. Bulakh and M. Voloshchuk. The book presents the results of many years of fundamental ecological and biological studies of the *Narcissus angustifolius* – a unique botanical taxon, and that work can be considered as a significant contribution to the development of biological science. The history of the species' research in domestic and foreign literature is analyzed, the geography of its distribution, ecological-phytocenotic, morphological and population features are presented. It is emphasized that the conservation measures implementation, in particular in the Narcissi Valley, such as periodic hay mowing, felling of willows and regulation of the hydrological regime, allows maintaining this population in a satisfactory condition. Moreover, the regulation of succession processes ensures the conservation of another 23 species of rare and endemic plants and 10 species of rare animals listed in the Red Book of Ukraine and the International Red Lists.







**Collection of legal regulations and scientific articles "Fundamentals of biosphere reserve management in Ukraine"; volume of conference proceedings on the occasion of the XXIII International Hutsul Festival and the celebration of the 45<sup>th</sup> anniversary of the UNESCO MAB Program**

In the same year, the Ministry of Ecology and Natural Resources of Ukraine, the Carpathian Biosphere Reserve and the Uzhanskyi National Nature Park published, under the editorship of Doctor of Biological Sciences, Professor, Honored Conservationist of Ukraine, Deputy Director of the Carpathian Biosphere Reserve Fedir Hamor and PhD in Biological Sciences, Honored Conservationist of Ukraine, Head of the Department for Protected Areas Development of the Ministry of Natural Resources of Ukraine Hryhoriy Parchuk, collection of writings "Fundamentals of Biosphere Reserve Management in Ukraine" [26]. The collection of writings contains the main regulations of UNESCO (Resolution of the 28<sup>th</sup> UNESCO General Conference (1995), Concept for the development of biosphere reserves, Seville Strategy for Biosphere Reserves, Statutory Framework of the World Network of Biosphere Reserves, Pamplona Recommendations (Seville +5) on the establishment and operation of transboundary biosphere reserves, the Madrid Biosphere Reserves Action Plan, the Dresden Declaration on Biosphere Reserves and Climate Change, etc.) and Ukrainian legislation governing the activity biosphere reserves (zapovidnyks). Articles, comments and nomination dossiers are presented that analyze the experience of implementing biosphere reserves concept in Ukraine and abroad, including the implementation of the Statutory Framework for Biosphere



Reserves, the Seville Strategy, the Madrid Action Plan and the Dresden Declaration on Biosphere Reserves; the collection also outlines the prospects for the development of the biosphere reserve network in Ukraine. A draft model law is published on the implementation of the concept of biosphere reserves in national legislation developed by France's National Committee for the UNESCO Man and Biosphere Program in 2010, and which was recommended for implementation by the International Coordination Council of the UNESCO Man and Biosphere Program to the governments of all the countries, where biosphere reserves were created. The collection also contains materials of the international scientific-practical seminar "Development of the biosphere reserves system in Ukraine", which took place on October 1-3, 2014 on the basis of the Uzhanskyi National Nature Park.

On the occasion of the XXIII International Hutsul Festival and the celebration of the 45<sup>th</sup> anniversary of the MAB UNESCO Program, the



reserve also held an international scientific conference and published a volume of proceedings under the title "Ecological, socio-economic, historical and cultural aspects of the Maramures border region development" [10]. The materials of the volume of proceedings are devoted to environmental, socio-economic, historical and cultural aspects of the Maramures border areas development. The environmental problems of forest resources utilization, mining and construction of hydroelectric power plants in mountainous areas, conservation of landscape and biological diversity, creation of the Ukrainian-Romanian transboundary biosphere reserve in the Maramures Mountains and ways of solving the problems of waste management in the settlements were discussed. The papers dwell on the historical and cultural aspects, tourism, development of border infrastructure and restoration of historical cross-border passenger rail transportation as priority areas of cross-border cooperation.

In 2016, a special editorial and publishing department was created at the Carpathian Biosphere Reserve to prepare periodical scientific and popular science publications of CBR for printing and release. Thus, the first issue of a periodical scientific publication "Nature of the Carpathians: Annual Scientific Magazine of the Carpathian Biosphere Reserve and the Institute of Ecology of the Carpathians of the NAS of Ukraine" was published, which in 2015 was officially registered by the Ministry of Justice of Ukraine [29]. The purpose of this annual magazine is to disseminate information about the results of natural scientific research held in the Carpathian region, to inform the scientific and environmental community about the current issues related to biodiversity and landscape diversity, nature protection and use of natural resources, as well as on sustainable development of the Carpathian region, and protected areas' activity. The publication of the scientific magazine supports the unification of scientists from different directions and specialties in the field of Carpathian nature research. The scientific papers and science- practical recommendations, which are published in the given collection of scientific works, are not only helpful in stimulating research activities, but also help to conserve nature and organize sustainable mode of resource use in the Carpathians.

In 2017, the All-Ukrainian Non-Governmental Organization "Association of Protected Areas of Ukraine", NGO

"Carpathian Ecological Society" and the Carpathian Biosphere Reserve published a volume of popular-science and journalistic materials "Protected areas network of Ukraine: Absolute preservation or a European model of harmony between man and nature? [14]. In the book, under the general editorship by the Honored Conservationist of Ukraine M.P. Stetsenko and Doctor of Biological Sciences, Professor, Honored Conservationist of Ukraine F.D. Hamor, the issues of formation and development of nature conservation processes in Ukraine are discussed. The problems of active and passive nature protection and introduction of the absolute conservation regime are analyzed. The basic problems of protected areas operation, zonation and management of the territories and objects of belonging to the PAs system of Ukraine are raised. The perspectives of the protected areas development as model territories for sustainable development and the need for improvement of the environmental legislation in Ukraine are outlined.

In the same year, on the occasion of the 10<sup>th</sup> anniversary since listing the primeval beech forests of the Carpathians into the UNESCO World Heritage List, the monograph of Professor, Doctor of Biological Sciences of Fedir Hamor "Global recognition of beech primeval forests of the Carpathians: history and management" was published in Uzhgorod [5]. The monograph provides detailed information of past events related

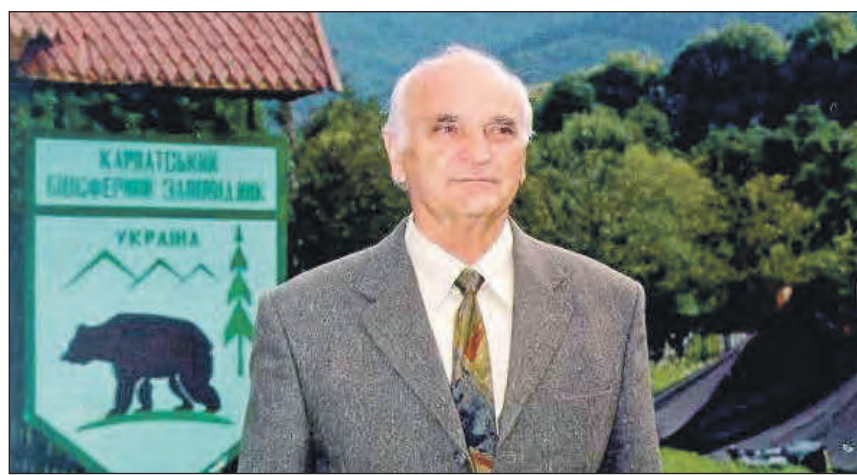
to the preparation of nomination dossiers and their approval for the UNESCO World Heritage List, as well as the detailed information on the conservation of the Carpathian and European beech forests and effective cooperation with NGOs, local authorities and forest owners. To help the reader, a detailed overview of official documents prepared by conservation officials of various levels related to the management of beech forests, beginning with the decrees of the President of Ukraine, down to the regional authorities and local self-government bodies. This review also includes legal documents related to protection and conservation of beech primeval forests as the UNESCO World Heritage Property.

On the occasion of the 10<sup>th</sup> anniversary since the inclusion of Carpathian primeval beech forests in the list of UNESCO World Heritage Properties, an international scientific conference was held in Rakhiv and a volume of conference proceedings was published under the title "The 10<sup>th</sup> Anniversary of the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathian and the Ancient Beech Forests" – history, status and problems of the Integrated Management System implementation" [8]. The above-mentioned volume of proceedings reviews the results of studies held by scientists on the history of the transnational Ukrainian-Slovak-German UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech



Collection of selected papers "Nature Conservation in Ukraine: Absolute conservation or a European model of harmony between man and nature?"; a volume of conference proceedings on the occasion of the 10<sup>th</sup> anniversary since the inclusion of the Carpathian primeval beech forests in the UNESCO World Heritage List; monograph "Narcissus angustifolia in the natural flora of Ukraine"

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



**Dr. Ivan VOLOSCUK,**  
**Professor,**  
**Slovak Ecological Society**  
**of the Slovak Academy**  
**of Sciences,**  
**Tatranska Lomnica**

1. The Carpathian Biosphere Reserve has been known for its global conservation processes since 1990. It launched an active international cooperation, which successfully presented the nature conservation activity of Ukraine in Europe. Adhering to the integrated concept of biodiversity protection, CBR has become one of the leading environmental institutions in Ukraine and Eastern Europe. Thanks to her former director, Prof. Fedir Hamor, they started successful cooperation with Slovak and German environmental institutions. Scientific conferences organized by this protected area have made a significant contribution to improving the conservation, environmental and practical aspects of the Carpathian nature's protection.

2. Among the most important events initiated by the former Director, Prof. Fedir Hamor we can name the following:

- participation in international research activities in the Carpathian forests (1991-1993) aimed at restoration of the sample plots laid by Prof. Zlatnik back in 1935-1938.

- Working jointly with Slovak environmentalists (Prof. Voloscuk) on the development of the nomination dossier for the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians" (2000-2007).

- Collaboration with the German (Prof. Knapp) and Slovak (Prof. Vlosucuk) partners-environmentalists on preparing the nomination dossier for the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany" (2008-2011).

- Contribution into the preparation of the nomination dossier for the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" (2012-2017).

- Annual organization of international conferences on protection and management of the Carpathian biodiversity.

- Construction of the Museum of Mountain Ecology in Rakhiv, and a network of ecological information centers in the Geographical Center of Europe and in other parts of CBR.

3. An important contribution made by CBR to the conservation process in the Carpathian Mountains would become establishing a "Bibliography center of scientific papers dedicated to nature protection in the Carpathians".

6. Among my most vivid memories of working together with CBR and its

former director is Prof. Fedir Hamor I can name:

- My extraordinary admiration of Prof. Fedir Hamor for his stamina, sacrifice and personal passion for the protection of the Carpathians.

- I would like to recall here the scientific conference in Yaremche, 1991, where I've initiated the creation of the Association of the Carpathian National Parks and Reserves.

- I highly appreciate the extremely active involvement of CBR in the international cooperation within the Association of Carpathian National Parks and Reserves, founded in 1992 in Tatranska Lomnica.

- Collaboration with CBR on Reproduction of marmot – *Marmota marmota ssp. tatrica* – in the vicinity of Pip-Ivan of Maramures Mt. in 1993.

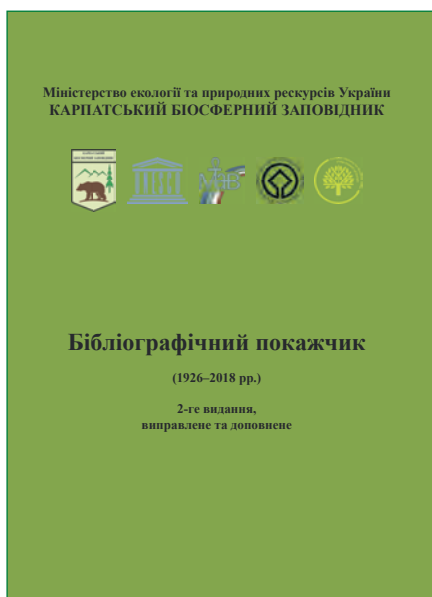
- Material support of Prof. Zlatnik's sample plots restoration in 1992-1994 in the vicinity of Pip-Ivan of Maramures Mt.

- Annual active participation of CBR in the activities of the Association of Carpathian National Parks and Reserves through the organization of numerous international scientific conferences.

- Conceptual and purposeful collaboration on preparation of the nomination dossiers for the UNESCO World Heritage Property "Primeval Beech Forests of the Carpathians and the Ancient Beech Forests of Germany" together with Prof. Fedir Hamor and German colleagues Prof. Knapp and Prof. Ibsch from the University of Sustainable Development, Eberswalde.

- Collaboration with protected areas throughout Europe in preparation of the nomination dossier for the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe".





**Bibliographical reference (1926–2018); volume of proceedings of the international conference "Primeval and ancient beech forests of Europe: problems of conservation and sustainable use"**

Forests of Germany", and implementation of the Integrated Management System, as well as on involvement of local communities, NGOs, and other groups of stakeholders to save it. The status and prospects of deepening scientific research, encoeducation and sustainable development in the vicinity of the UNESCO World Heritage Property, anthropogenic threats and risks of catastrophes for these global values, as well as the experience and problems of organizing educational and information programs aimed at popularization are analyzed together with the methods to improve legislation aimed at its preservation.

We would also like to draw your attention to Professor Hamor's latest publications, namely: "The Reference Model of European Forest Ecosystems and Nature Conservation" and "Ukraine-Romania: Bridges of People's Diplomacy. Notes dedicated to the 20<sup>th</sup> anniversary of collaboration between the Union of Ukrainians in Romania and the Carpathian Biosphere Reserve in the process of Ukrainian-Romanian cross-border cooperation development in the Maramures region". The first publication provides a brief historical reference on establishing forest reserves in the Carpathians, formation of the Carpathian Reserve (Zapovidnyk) and the expansion of its territory. There are also analytical materials provided on the creation of the Carpathian Biosphere Reserve, its awarding with the European Diploma, as well as listing the Carpathian primeval

beech forests to the list of World Heritage Sites and the adoption by the President and the Government of Ukraine a number of decisions on their conservation and sustainable development of the mountain settlements located in the vicinity of these primeval forests, etc. The second book provides an overview of the experience of the Union of Ukrainians of Romania and the Carpathian Biosphere Reserve in the process of development of Ukrainian-Romanian cooperation in the Maramures region. Much attention is paid to the reconstruction of the destroyed motorway bridge across the Tisza in Dilove-Valea Viselui, and restoration of the historical passenger trains from the town of Rakhiv to Romania, Budapest and Prague, creation of a cross-border Ukrainian-Romanian biosphere reserve in the Maramures Mts., etc.

Thus, the publishing activity of the Reserve is now an important component of the research work that contributes to the institution's role as a powerful intellectual center. The Carpathian Biosphere Reserve is the founder of a series of periodicals, including the All-Ukrainian Ecological Popular-Science Magazine "Green Carpathians" (55 issues), the regional ecological newspaper "Newsletter of the Carpathian Biosphere Reserve" (72 issues), a scientific periodical "Nature of the Carpathians: Annual scientific journal of the Carpathian Biosphere Reserve and Institute of Ecology of the Carpathians of NAS of Ukraine" (3 issues already published).

The scientists of CBR are currently working on preparation of a series of scientific publications, namely: "The Carpathian biosphere reserve: living in harmony with nature", "Flora and vegetation of CBR", "Fauna of the Carpathian Biosphere Reserve", "Veterans of the Reserve", and many others.

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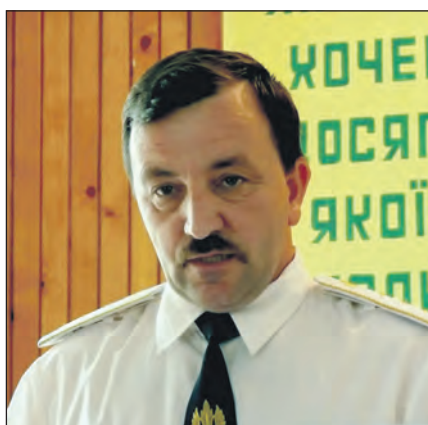


Scientific periodical "Nature of the Carpathians: Annual scientific journal of the Carpathian Biosphere Reserve and Institute of Ecology of the Carpathians of NAS of Ukraine"; Prof. Hamor's monograph "Reference model of European forest ecosystems and nature conservation"

## ABOUT THE STATUS OF CONSERVATION MEASURES IMPLEMENTATION AND MATERIAL AND TECHNICAL RESOURCE BASE STRENGTHENING

### AT THE CARPATHIAN BIOSPHERE RESERVE

**Mykola RYBAK,**  
*Director  
of the Carpathian  
Biosphere Reserve,  
Honored Conservationist  
of Ukraine*



20,000 cubic meters of timber was fallen in the territory of ca. 200 ha. Sanitation activities mainly helped us to eliminate the effects of the natural calamity. The only obstacle was the official procedure for eliminating the effects of the storm in the territory, which was transferred to the reserve for protection and implementation of conservation measures, as it was unclear. This issue is now being resolved and steps are being taken to complete these works.

Annually the Ranger Service conducts forest pathological survey of the forest sites, which results in the preparation of an inventory of forest pests and diseases as of November 1 of the current year. Damaged areas of the forest sites were included in the sanitation activities plan.

Every year, preventive measures are being taken to prevent forest fires. These are: arrangement and repair of firebreaks and roads of fire-fighting purpose, installing of appropriate signs and carrying out explanatory work with the local population, visitors, etc..

For the period 2002-2015, logging was carried out on the area at 9192.4 hectares in the territory of CBR with felling of 162241 m<sup>3</sup> of wood, including: in the core area – on the area of 3.7 hectares with cutting down of 68 m<sup>3</sup> of timber (cutting along trails); in anthropogenic landscapes' zone on an area of 6250.34 ha with logging of 82770 m<sup>3</sup> of wood; in the buffer zone – on an area of 2589.65 hectares with felling of 72390.5 m<sup>3</sup> of wood; in the area of regulated protection regime – on an area of 338.66 hectares with felling of 4543 m<sup>3</sup> of trees.

The obtained timber was allocated to the population living in the area of CBR's activity and for our own needs.

According to the plan of conservation measures for 2002-2015 CBR annually held:

Thus, in the period from 2002-2015, improvement fellings, sanitary-improving measures (continuous sanitary felling, selective sanitary felling and clearing of fallen branches) and other conservation-aimed interventions were carried out in the territory of CBR. The reasons to carry out the sanitary-improving measures are: damage to the coniferous stands caused by the mottled butt rot, stem rot, stem pests, in particular bark beetle, the damage to the deciduous plantations caused by bracket fungus, occurrence of wind-fallen areas etc. The improvement fellings were carried out in accordance with the Management Plan of CBR (2002). Other fellings that took place over a 14-year period are: logging the trees along roads and hiking trails which posed a threat to people, cutting the trees which posed a threat to electricity lines, clearing hayfields and cutting down willows in the Narcissi Valley field division.

As previously reported, a storm that swept across the territory of Rakhiv district of Zakarpattia region on June 29 and September 17, 2017 (in the territory under direct management of the reserve) caused significant windbreaks with lots of wind-broken trees in the territory of CBR. About

The Carpathian Biosphere Reserve is located in the territory of Rakhiv (72% of the total area), Tiachiv (22%), Khust (4%) and Vynohradiv (2%) districts of Zakarpattia region. The total area of the reserve is 58.035,8 hectares and it consists of the lands that have been handed over for its permanent use with an area of 39.485,8 hectares and the lands of other land users with an area of 18.550,0 hectares, which are part of the territory of the reserve without exclusion from the use by official land users.

In 2018, the works on the Management Plan development are being accomplished. We can say that this process is a very important indicator of the success of the Carpathian Biosphere Reserve's activity.

The conservation measures at CBR are planned annually in accordance with the Management Plan (it is called in Ukraine "the project of territory organization, use and protection of its natural complexes") to the extent justified by the possibility to fund them at the expense of general and special funds of the State budget. The Special administration created at the Reserve may carry out nature conservation measures only on the lands that are under direct management of the reserve.

- fire-prevention measures: firebreaks maintenance ca. 60,82 km; arrangement and repairing of the mountain trails ca. 59.16 km; repair and maintenance of roads ca. 24.23 km; clearing of mountain streams – 4.2 km;

- biotechnical measures: 1400 brooms for feeding herbivores were prepared; 7 feeders and 10 salt slots were repaired; hay mowing for animals' needs – 65.14 centners; river cascades – 28.2 m.

During the period 2002-2016, wild fruits, berries and mushrooms were harvested by the local population outside the core area, in the generally defined order. The reserves of these forest plant resources are small and the volume of harvesting is negligible and does not adversely affect the forest ecosystems.

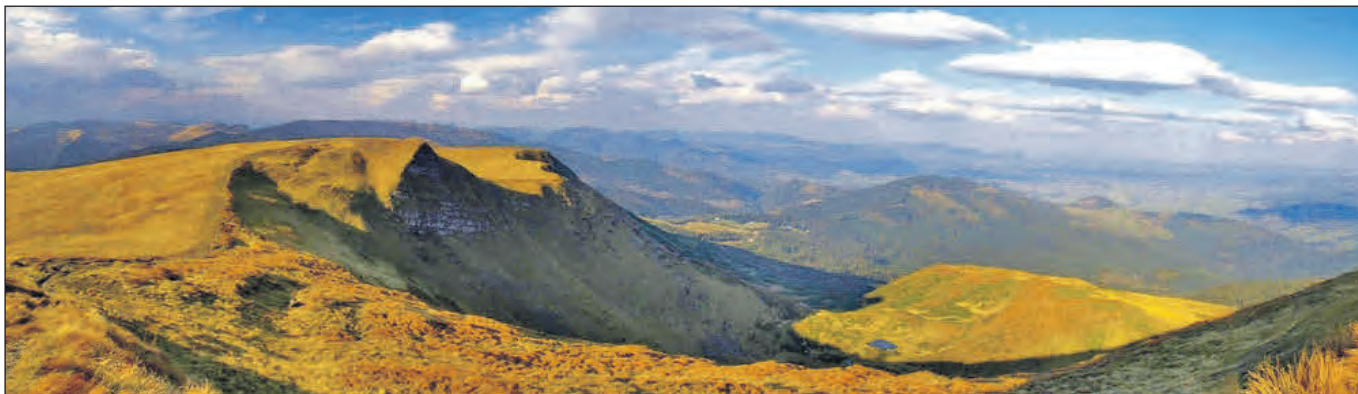
Also, on the territory of the reserve, outside the core area, annual mowing was carried out on an average of 345 hectares. Livestock grazing (on average, 922 individuals of cattle, 16 horses, 7295 sheep and 34 goats) was carried out on an area of 7332.8 ha. The pressure per hectare of farmland for sheep and goats was ca. 2.5-3 individuals per 1 ha (up to 5), horses and cattle 1-1.3 individuals per 1 ha (2 is the permitted maximum).

For the needs of the highland farms, the reserve's administration allocates the necessary amount of wood which is received from sanitary logging.

Hay mowing was carried out by the employees of the reserve, who are responsible for the identified hayfields,



**From left to right:**  
**Deputy Chairman of the Rakhiv District Council Ivan KOPYCH,**  
**Chairman of the Tiachiv District Council Vasyl KAHANETS,**  
**Director of CBR Mykola RYBAK and Deputy Director of the institution Professor Fedir HAMOR**  
**during the meeting of the Coordination Council of CBR (2016);**  
**Mykola RYBAK, Honored Conservationist of Ukraine, talks to the students of the University of Sustainable Development, Eberswalde, Germany (2017);**  
**During the meeting of protected areas directors of the Carpathian region lead by the Minister of Environmental Protection of Ukraine Ostap SEMERAK (Yavorivskiyi NNP, May 2016 p.).**  
**First on the right: directors of the Synevyr NNP Mykola DERBAK and of CBR Mykola RYBAK**



## The scientific patrol

and by the local population on the basis of agreements. Livestock grazing – on the traditional pastures, meadows, hayfields, and within the gardens of the citizens living within the territory of the reserve.

At the Narcissi Valley, in order to conserve biocenoses with the participation of narcissus and other rare and endemic species, mowing is carried out in the zone of regulated conservation regime after a special survey held by the working group consisting of the Scientific-Technical Council members and after obtaining the appropriate permits.

One of the main tasks of the reserve is to ensure the sustainable use of natural resources by creating favorable conditions for tourism and recreation in the natural environment. The main condition for such activity is the prevention of damage to natural complexes, ensuring their conservation and restoration, adherence to the conservation regime within the protected areas. The main means of achieving this is rational planning and creation of infrastructure.

The recreation and tourism infrastructure at CBR is in general developed, but has to be maintained and improved.

Special trails have been developed for tourists, as well as recreational areas, places for short-term rest, sources of drinking water, places for tent camps, high mountain eco-stations, a network of eco-education centers etc.

Annually the Reserve is visited by some 40.000 people.

During the 50-year long history of its operation, CBR has built itself or got from the state forestry enterprises during the phases of the territory expansion over 60 buildings of different purposes (offices, service facilities etc.). Most of them are used by the Ranger Service of the reserve and





the researches from the scientific divisions of CBR. The forest huts are mainly opened 24/7, so that the hikers can also use them as shelters in a nasty weather.

Some 140 km of forest roads are listed in the fixed assets of CBR. Most of them lead to the highland meadows located within the territory of the Reserve, where ca. 8.000 sheep and 800 of cows are pastured annually. These domestic animals are traditionally owned by the citizens of the local communities located in the zone of CBR's activity. Every year, beginning with spring, a pressing problem occurs with fast repairs of these access roads. Because of the deficiency of road-building machinery and restricted budget the reserve today does not have a possibility to improve the quality of the existing forest roads and to conduct a thorough overhaul. And of course we are not able now to start the construction of the new forest roads, though there's a crucial need in them in some places.

Still, even with the modest possibilities that we have, CBR carries out routine repair works of the aforementioned roads both by itself, and with the involvement of the state forestry enterprises and the citizens of the communities. The road from the village of Dilove leading to Lysychyi mountain meadow (most of it is owned by the Velykyi Bychkiv SFE) remains a big problem, same as the one leading from the village of Lazeshchyna (owned by the Yasinia SFE). In both cases the biosphere reserve is ready fund that segments of the roads which we've got the legal responsibility for according to the list of fixed assets. Due to the absence of reliable road-building machinery and unwillingness of the state forestry enterprises to work with us together and help the communities, this issue remains a problematic one for two years already. They even attempt to blame CBR alone in all these problems. We think that the problems like these should be solved only

under the coordination of works by the local government bodies and municipalities. By the way, the reserve has already started the works on the reconstruction of the access roads leading to the mountain meadows of Kvasnyi and Lysychyi leading from the village of Bohdan going through the territory of the Maramures field division of the reserve. In addition to that, it is planned for 2018 to re-open car entry along the highland zone around Petros Mt., etc. apart from the aforementioned roads, CBR maintains with its own funds the road leading to Hoverla Mt. and Turkul mountain meadow, which goes through the village of Luh, and the one leading to Petros Mt. through the villages of Bohdan and Keveliv. The restoration of the access roads leading to Urda mountain meadow and other polonynas (alpine meadows in Ukrainian) is done jointly with the relevant communities.

It is worth mentioning here, that during the recent years we are facing numerous obstacles that prevent us from fulfilling our conservational, scientific research, ecoeducational, recreational and other functions on an appropriate level, they are such as: restricted funds for the conservation measures, road and sustaining walls destruction, deterioration in condition of other facilities owned by the reserve because of the floods that have swept across its territory back in 1998, 2001, 2008 and 2010, unavailability of proper road-building machinery, closure of a saw-mill at the reserve, absence of clear regulations of getting the permits for forest fellings in environmental purposes etc. such a situation also negatively impacts the cooperation between the administration of the reserve and the local communities, and also makes it impossible to successfully implement the Law of Ukraine "On expansion of the territory of the Carpathian Biosphere Reserve" No. 25 dated on January 15, 2010, and also creates

a negative image of the biosphere reserve.

By the way, the flood of 2008 alone has destroyed 82.800 m<sup>2</sup> of roads surface, 1.553 m of sustaining walls, and 26 bridges. The estimated cost of the losses was over 4.000.000 back then. No special purpose funding has ever been allocated for the mitigation of the natural calamities' consequences, and that is why lots of infrastructure elements of CBR remain unfixed.

Thus, it is extremely important to provide CBR with the access to road-building machinery and other equipment that will enable the implementation of the conservation measures. This will help us to keep the road infrastructure in a corresponding operational state, to respond on emergency situation immediately (i.e. landslides, flash floods, windfalls, high waters in rivers and streams etc.), and also to implement the conservation measures and other management activities effectively and timely in a less expensive manner that it would be done by a contractor.

Also, the limitations imposed by the Decree of the Cabinet of Ministers of Ukraine Nr. 65 dated on 1.03.2014 "On economizing of the state budget and prevention of the state funds losses" (became invalid in November 2016), and the one dated on 10.11.2016 No. 710 "On efficient use of state funds".

Exactly because of this reason in the recent years we managed only to maintain the buildings owned by us in an operation state, as well as the tourism information and ecoeducation centers. Operating repair works of the fire safety roads were carried out to a limited extend, well as the maintenance of the mountain hiking trails and firebreaks.

The aforementioned works became more active in 2017, when the limitations were lifted and we could fund those activities from own budget. Thus, the operating repairs of the buildings owned



**Meeting of the Coordination Council of CBR in Tiachiv, Zakarpattia region (May 2017)**

by CBR were conducted (last year the repair works were carried out at the offices of the Trybushany and Shyrokyi Luh field divisions, the forest huts in the Bohdan-Petroske and Trybushany field divisions). Also, major structural repairs of the central boiler room and service premises were carried out at the central office of the reserve, plastic windows were installed in scientific laboratories, relaxation rooms and part of premises of the Maramures field division, where first-grade pupils from the village of Bohdan are currently studying, and a number of other works. Stihl-360 chainsaw units were purchased for the field divisions of the reserve in order to ensure timely and high-quality implementation environmental measures. Work is underway on the recreational landscaping of the territories of the territories around offices of the field divisions. In this direction, a good example is shown by the Keveliv, Trybushany, and Bohdan-Petroske divisions of CBR.

In 1997, the Carpathian Biosphere Reserve was enlarged by receiving the lands of the Kostylyvka forestry district of the Velykyi Bychkiv State Forestry Enterprise together with the trout farm that was not working at that time. Despite the almost complete lack of funds, the gradual revival of the trout nursery began. There were neither trout breeding experts, nor sufficient financial resources at CBR back then, and these factors combined with the irresponsibility of some employees who were then in charge of the trout farm did not allow to make this place attractive as a tourism and recreation area. Today, trout farm is one of the best holiday and weekend spots. Over 5,000 people visited this recreation center last year. Here, the guests are introduced to the methods of breeding the brown and rainbow trout species, as well as some *Salvelinus* species;

they can visit the tourist information center "Carpathian Trout", and if they wish they can buy some fish and cook it on the spot. In addition, over the past years, a significant amount of work has been done on landscaping, repairs of the buildings and structures, and a video surveillance system was installed. A nice summer pavilion was built, resting zones were arranged etc. This year, in the vicinity of the trout farm, a tourist route of about 3 km was laid – to an extremely interesting waterfall called "Lykhyi" (Nasty). The route has already been marked, information signs have been installed, and four additional resting places arranged.

There is an apiary of 18 bee-hives in the Chornohora field division of the reserve. It is planned to create a demonstration apiary and an information center "The Carpathian Bee", and also to expand the already existing apiary up to 40 bees. Given that it is located at the head of the main hiking trail to Hoverla Mt., the visitation is going to be high. This will significantly increase the financial income due to the visits to the apiary and the information center and the sale of honey and bee-related products. The Carpathian Bee Information Center will perform ecological-educational and awareness rising functions at the same time.

The premises of the reserve are heated with coal, and the heating system, which has been in operation for about 40 years, needs an urgent reconstruction and major overhaul.

Since 1997, the Narcissi Valley, covering an area of 257 hectares, is a part of the Carpathian Biosphere Reserve's territory. The area of *Narcissus angustifolius* growing locus today constitutes about 85 hectares and has not decreased in recent years. In general, the high-altitude species of the narcissus represented in this valley does not bloom

at the elevation of 200 m above sea level elsewhere in the world.

There is no threat of disappearance for the Valley of Narcissi; in natural conditions, these flowers will be able to grow for other tens of years. Poor management can though pose a problem. However, the area of the narcissus' growth can be significantly increased with the help of the necessary conservation measures. Such work in the Valley of Narcissi is underway, there are new localities with these plants, but the state of the Valley should be significantly enhanced. For this purpose, the administration of CBR has set up systematic work on the felling of willows, arranged a series of hydro-structures to raise the water level, provided adequate protection and scientifically-justified mowing and grazing mode.

Realizing that due to the low financial capabilities, the reserve is not able to properly carry out the planned environmental protection measures and strengthen its material and technical capacity, the Ministry of Environmental Protection of Ukraine has agreed, at the expense of the Ukrainian-German project "Support to nature protection areas in Ukraine" for 2018-2019, to conduct a complete reconstruction and renovation of all existing buildings on the central office of the reserve, including the Museum of Mountain Ecology, as well as buildings of the field offices during 2020-2022. Thus, at the central office there will additionally be built a hotel for 20 beds, a new conference room, dining room and a large number of office spaces. The administrative premises will be moved to the main building, and the central boiler room will be completely refurbished and adjusted for firewood. It is planned to install a number of solar panels on the roofs of the buildings and more. Preparation of design project and cost estimation is ongoing. There are also plans to include here the purchase of a road construction vehicle, a bus, all-terrain vehicles, motorcycles, office equipment, uniform for the Ranger Service, etc. Part of the project funds will be used to finance priority activities in the territorial communities located in the area of CBR's activity.

The first all-terrain vehicle Renault DUSTER has already been given to the Carpathian Biosphere Reserve at the expense of the project's funds and is being successfully used.

**Spring in Rakhiv;  
young participants of the  
festival "Berlybash Banush"**

# Зелені Карпати





## FIFTY GLORIOUS YEARS

**Events held during the celebration of the 50<sup>th</sup> anniversary of the Carpathian Biosphere Reserve – the flagship of nature conservation in Ukraine**



Stone placers in the Chornohora field division; protected area's secret places

### THE ISSUE OF THE 50<sup>th</sup> ANNIVERSARY SINCE ESTABLISHING THE CARPATHIAN RESERVE WAS DISCUSSED AT THE MEETING OF THE NATIONAL COMMISSION OF UKRAINE FOR UNESCO

The 23<sup>th</sup> meeting of the National Commission of Ukraine for UNESCO took place in Kyiv, at the Ministry of Foreign Affairs of Ukraine, on February 8, 2018.

During the discussion of the reports made, the Deputy Director of the Carpathian Biosphere Reserve, Professor Fedir Hamor, drew the attention of the participants to the outcomes of the international conference held the Carpathian Biosphere Reserve in September 2017, under the auspices of the National Commission of Ukraine for UNESCO, which was dedicated to the 10<sup>th</sup> anniversary since enlisting the Carpathian primeval beech forests into the UNESCO World Heritage List.

He also raised the issue of organizing a number of events to mark the 50<sup>th</sup> anniversary of the Carpathian Reserve under the auspices of the National Commission of Ukraine for UNESCO.

The Carpathian Reserve (Zapovidnyk) was established by the Resolution of the Council of Ministers of the USSR dated on November 12, 1968 No. 568 "On the organization of new state reserves in the Ukrainian SSR", in the territory of Ivano-Frankivsk and Zakarpattia regions as the first big nature reserve (zapovidnyk) of national importance in the Ukrainian Carpathians.

And in 1993 the Carpathian Biosphere Reserve was designated based on the nature "zapovidnyk" by the Decree of





**p. 91: Meeting of the National Commission of Ukraine for UNESCO is headed by Serhiy KYSLYTSIA, Deputy Minister for Foreign Affairs of Ukraine, Head of the National Commission of Ukraine for UNESCO (third from left); participants of the meeting (from left to right) Director of the Askania-Nova Biosphere Reserve Victor HAVRYLENKO, Director of the Department of Ecological Network and PAS of the Ministry of Natural Resources of Ukraine Viktor KLID, Deputy Director of the Conservation BR, Professor Fedir HAMOR, and Head of the Agency for Ecological Network and PAS of the Ministry of Environmental Protection of Ukraine Hryhorii PARCHUK;**  
**p. 92: Professor Fedir HAMOR (second from left) takes the floor at a meeting of the National Commission of Ukraine for UNESCO**

the President of Ukraine "On Biosphere Reserves in Ukraine".

During the years of its activity, the Carpathian Biosphere Reserve became an internationally recognized nature conservation and scientific research institution, and it has made a significant contribution into conservation of natural ecosystems and sustainable development of the Carpathians, establishment of the ecological network and development of nature protection in Ukraine as a whole.

The Carpathian Biosphere Reserve is the only institution of its kind in Ukraine to be awarded for four times with a European diploma for protected areas by the Council of Europe, and it is a member of the MAB UNESCO World Network of Biosphere Reserves.

Its scientists initiated formation of the European Beech Forest Network and creation of a transnational UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe", in which among the primeval and ancient beech forest sites from 12 European countries the primeval beech forests of CBR take the first place by their territory.

Under the initiative of the administration of the Carpathian Biosphere Reserve, many other ecologically and socially significant national and international projects were implemented, in particular, the Carpathian Convention was adopted along with other initiatives. To mark the 50<sup>th</sup> anniversary of the creation of the Carpathian Reserve a series of events are organized, namely: an international scientific conference "Problems of mountain ecosystems conservation and sustainable use of biological resources of the Carpathian Mountains", a series of scientific and popular publications, a video film about the history, values and activities of the Carpathian Biosphere Reserve, the anniversary postage stamps, production of relevant information and educational material in the area of CBR's activity, roundtable meetings, presentations in central and regional media, etc.

**Fedir HAMOR,**  
**Deputy Director of the Carpathian Biosphere Reserve,**  
**Doctor of Biological Sciences, Professor,**  
**Honored Conservationist of Ukraine,**  
**Member of the National Commission of Ukraine for UNESCO**

On June 4, 2018 in the framework of the World Environment Day, in Uzhgorod, under the roof of the Zakarpattia Regional State Administration, a series of events was held to mark the 50<sup>th</sup> anniversary of the Carpathian Biosphere Reserve.

The event was attended by top-authorities of Zakarpattia region, a large group of environmentalists, scientists and wide public. The organizers were the administration of the Carpathian Biosphere Reserve, the Department of Ecology and Natural Resources of the Zakarpattia Regional State Administration, the Community Council at the Zakarpattia Regional State Administration, and the Transcarpathian Society for Nature Conservation.

In the atrium of the Zakarpattia Regional State Administration, accompanied by performances of People's Artiste of Ukraine Maria Zubanych and Honored Artiste of Ukraine Oksana Ilnytska, an exhibition "Carpathian Reserve – 50 years history of guarding the Carpathian nature" was officially opened.

Photographs and other illustrative materials presented flora, fauna, and other unique natural and cultural values of the Carpathian Biosphere Reserve, as well as the history of its creation and main directions of its activity.

And at the press briefing, the Deputy Director of the Carpathian Biosphere Reserve, Doctor of Biological Sciences, Professor Fedir Hamor and the Chairman of the Ukrainian Society for Nature Conservation, Doctor of Economics, Professor Vasyl Shevchuk gave a detailed analysis of the ecological situation in Ukraine and Zakarpattia region in particular, highlighted a number of environmental issues, and the attention was paid to meeting the requirements of the Carpathian Convention, etc.

Deputy Head of the Zakarpattia Regional State Administration Victor Mikulin when officially opening the round-table meeting on the topic: "The role of the Carpathian Biosphere Reserve and other protected areas for natural and cultural values conservation and implementation of the sustainable development strategy in Zakarpattia" stressed that CBR is the flagship institution in the field of nature conservation. It is the best protected area in Zakarpattia, occupying an area of almost 60 000 hectares. They do a significant amount of work, especially in

## THE OFFICIAL EVENTS DEDICATED TO THE 50<sup>th</sup> ANNIVERSARY OF THE CARPATHIAN BIOSPHERE RESERVE WERE HELD AT THE ZAKARPATTIA REGIONAL STATE ADMINISTRATION

the field of scientific research, which is the main focus of the biosphere reserve and other national nature parks. The recognition of its scientific work, in particular, is proved by the today's round table meeting.

Victor Mikulin expressed his gratitude to the staff of the reserve and its long-term leader, Doctor of Biological Sciences, Professor Fedir Hamor for his ability to organize works at a high level. The Head of Zakarpattia RSA tasked the institution to more actively undertake the expansion of the territory of the biosphere reserve at the expense of valuable territories, and to complete the land use planning and management documents, and drew attention to other legal and administrative problems that are still present at the reserve.

Greetings and sincere wishes to the environmentalists were also addressed by the Deputy Chairman of the Zakarpattia Regional Council Petro Hrytsyk, the Chairman of the Ukrainian Society for Nature Conservation Vasyl Shevchuk and the Chairman of the Community Council at the Zakarpattia Regional State Administration Mykhailo Hrenio.



The participants of the official events enjoyed a set of Zakarpattia folk songs performed by People's Artist of Ukraine Maria ZUBANYCH and Honored Artist of Ukraine Oksana ILNYTSKA; in the presidium of the round-table meeting (from left to right): Mykhailo HRENIO, Chairman of the Community Council at Zakarpattia Regional State Administration, Deputy Head of Zakarpattia Regional State Administration Victor MIKULIN, Deputy Director of CBR, Professor Fedir HAMOR and Head of the Ukrainian Society for Nature Conservation, twice Minister of Environment of Ukraine, Professor Vasyl SHEVCHUK; Director of the Uzhanskyi NNP Victor BYRKOVYCH taking the floor



**On a rostrum – Oleksandr KAHALO, Head of the Department of Natural Ecosystems Conservation of the Institute of Ecology of the Carpathians, NAS of Ukraine (Lviv)**

The round-table meeting was presented by: Fedir Hamor ("History of creation and some results of the Carpathian Biosphere Reserve's activity"), Yuriy Shponak, Deputy Director of the Department for Ecology and Natural Resources of the Zakarpattia Regional State Administration), Stepan Pop, Doctor of Physical and Mathematical Sciences, Head of the Department of Physical Geography and Rational Environmental Management of Uzhgorod National University (Natural resources of Zakarpattia and peculiarities of their use in protected and recreational areas and in the adjacent territories").

In the talks and discussions there was raised a wide range of issues regarding the role of the Carpathian Biosphere Reserve and other protected areas of Zakarpattia in conservation of natural and cultural values, the participants made a number of constructive comments and suggestions.

Thus, Olexander Kahalo, PhD in Biological Sciences, Head of the Department of Natural Ecosystems Conservation of the Institute of Ecology of the Carpathians, NAS of Ukraine (Lviv), Vasyl Chumak, PhD in Biological Sciences, Assistant Professor, Department of Entomology and Biological Diversity, Uzhgorod National University, Vasyl Manivchuk, Head of Zakarpattia Center for Hydrometeorology all noted the special role played by the Carpathian Biosphere Reserve and other protected areas in conservation of

rare and endangered plant and animal species and their habitats, formation of the Carpathian ecological network, organization of international scientific ecological research and environmental monitoring.

Directors of the National Nature Parks "Synevyr" and "Uzhanskyi" Mykola Derbak and Viktor Byrkovych, Corresponding Member of the National Academy of Agrarian Sciences of Ukraine, Doctor of Economics, Professor, Head of the Department for Tourism and Hotel and Restaurant Business Management at Uzhgorod Trade and Economic Institute Mykhailo Lendiel drew attention to the experience and prospects of recreational infrastructure and rural tourism development, as well as imperfection of legislation on providing local population with natural resources in the vicinity of protected areas.

The meeting also discussed the issues of cooperation between the Carpathian Biosphere Reserve and other protected areas with the public, organization of eco-education activity, popularization of their activities in the media (Olexander Herevych, director of the Zakarpattia Regional Ecological and Naturalist Center; Oleh Luksha, Deputy Chairman of the Community Council at the Zakarpattia Regional State Administration; Vasyl Nytko, correspondent of the Holos Ukrainy (Voice of Ukraine) newspaper in Zakarpattia region; Victor Braslavets, Director of the all-Ukrainian national publishing house Karpaty (Carpathians)).

Following the round-table meeting, detailed recommendations were adopted.

At the suggestion of Fedir Hamor, in accordance with the current legislation, it was recommended in particular that the administrations of the Carpathian Biosphere Reserve and national nature parks would prepare and send budget requests, and the Zakarpattia Regional State Administration would direct a corresponding request to the Ministry of Ecology and Natural Resources of Ukraine for the allocation of funds from the state budget for planned tax payments local councils, within which the lands of the biosphere reserve and national nature parks are located.

For example, the administrations of the Verkhovynskyi and Desniansko-Starogutskyi National Parks will already get funds from the State Budget for such purposes.

Thus, the Verkhovynskyi National Nature Park, covering an area of about 12,000 hectares, already allocates over 3.5 million hryvnias annually to the budgets of village councils, that is, about 300 hryvnias for every hectare of the protected area. This is precisely one of the compensatory mechanisms that the state must apply to the local communities for withdrawing especially valuable natural areas from the economic use and management.

**Fedir HAMOR, Doctor of Biological Sciences, Professor, Deputy Director of the Carpathian Biosphere Reserve**



**From left to right: Professors Vasyl SHEVCHUK and Fedir HAMOR during briefing at the Zakarpattia Regional State Administration**



**RESOLUTION OF THE ROUND TABLE MEETING  
HELD AT THE ZAKARPATTIA REGIONAL STATE ADMINISTRATION  
ON OCCASION OF THE 50<sup>th</sup> ANNIVERSARY  
OF THE CARPATHIAN BIOSPHERE RESERVE  
(Uzhgorod, June 4, 2018)**

Having heard 18 presentations and speeches during the discussion, the participants of the round table meeting point out that the protected areas of Zakarpattia play the key role in conservation and restoration of the Carpathian nature. An important place in this case belongs to the Carpathian Biosphere Reserve, which during the 50 years of its existence has made significant progress in the field of environmental protection and the implementation of the idea of sustainable development. Its activities contribute to the preservation and use of the natural and cultural values of the region through reliable protection, monitoring and management, which relies on a solid scientific base and creative approach.

International cooperation of the Carpathian Biosphere Reserve allows for broader solidarity between peoples and nations as for conservation and restoration of the planet's nature.

Participants of the round table meeting also state that the system of protected areas of Zakarpattia has a number of unresolved problems that require attention of the Ministry of Environment of Ukraine, local authorities, local self-government bodies, scientific institutions, as well as the general public.

Here are some of them: imperfection of environmental legislation and legal mechanisms for conservation of natural values, including a slow paced implementation of European legal norms of nature protection into the legal environment of Ukraine, imperfect system of logistical support and low level of salaries for the employees of protected areas of Ukraine, practically zero capacity building events for the protected areas staff members, tense relations with local communities, poor regulatory framework for financial activities of PAs and the Tax Code, which leads to a number of restrictions on the activities of these institutions, etc.

Based on the proposals considered during the round table meeting, its participants recommend the following:

1. To appeal to the President of Ukraine to accelerate the implementation of the principles of the habitat approach to conservation of biotic and landscape diversity into the legal frameworks of Ukraine. To prepare relevant amendments to the Laws of Ukraine "On the Protected Area System of Ukraine", "On the Red Book of Ukraine", "On the Ecological Network of Ukraine", as well as to the Forest, Water and Land Codes of Ukraine.

2. To recommend to RSA to monitor the implementation of resolutions of the Government of Ukraine and Decrees of the President of Ukraine on environmental protection development in Zakarpattia region and, if necessary, to develop an additional action plan for their implementation.

3. For the purpose of introducing economic levers to stimulate the protection of PAs, the compensation payments to the local communities for the withdrawal of especially valuable natural territories from the economic use, on the basis of the current legislation should be introduced, following the example of the Verkhovyna and Desnyansko-Starohutskyi National Nature Parks; the administrations of the Carpathian BR and national nature parks of the region should prepare and send budget requests to appropriate authorities, and the Zakarpattia Regional State Administration should prepare an application to the Ministry of Ecology and Natural Resources of Ukraine on allocation of funds from the State budget for the payment of land tax to local communities, which are located within the territory of the biosphere reserve and national parks of Zakarpattia.

4. To develop and put into practice additional measures to strengthen the control over entering the territories of PAs in Transcarpathia using off-the-road vehicles for whatever their purpose is.

5. Employees of the protected areas should be more actively involved in the development of regulatory documents

related to the protected areas development.

6. To focus scientific research activities held in protected areas on developing methodological recommendations aimed at the conservation of rare species and their habitats and addressing specific environmental issues.

7. To the administrations of protected areas together with the Zakarpattia Regional State Administration:

- to elaborate on the preparation of a special regional Program for enhancing the image and importance of protected areas in the context of sustainable development and improvement of infrastructure for ecological and rural tourism;

- to monitor the introduction and development of original destinations and forms of recreation in protected areas (for example, various forms of scientific and educational tourism, etc.);

- to generalize the experience of rural guesthouses that are providing services to tourists and holiday makers, to make an additional survey of hiking and cycling routes, to arrange recreation areas along the hiking trails and routes within protected areas;

- to prepare and release booklets on recreation opportunities in protected areas (characterize historical sites of such territories – churches, museums, landmarks, mineral springs, etc.);

- to calculate the permissible anthropogenic pressure (and, in particular, the technogenic one) in protected areas, to strengthen the control over the use of ecotourism routes;

- to organize a number of fairs for the sale of eco-friendly agricultural products to the tourists and holiday makers;

- to take into account the interests of the local population and seek mutual understanding through active dialogue with them, promote the development of green tourism and traditional forms of nature resource management.

## 50<sup>th</sup> ANNIVERSARY EVENTS HELD AT THE CARPATHIAN BIOSPHERE RESERVE

**50<sup>th</sup> anniversary** – a respectable date, so it is logical that the Carpathian Biosphere Reserve marked it at a proper level. Thus, from October 23 to October 25, 2018, a number of important events were held to celebrate the institution's anniversary. In particular, on October 23, a meeting of the National Steering Committee of the Ukrainian part of the UNESCO World Heritage Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" was held under the chairmanship of the Director of the Department for Ecological Network and Protected Area System of the Ministry of Natural Resources of Ukraine. During the meeting, Committee Secretary Vasyl Pokynchereda made a report on the participation of the Ukrainian delegation in the first meeting of the International Joint Steering Committee of the above-mentioned World Heritage Property (Croatia, April 2018). The meeting also discussed other issues that related, first of all, to the current state of affairs within the Ukrainian component parts of the Property. Also, a scientific conference "Problems of mountain ecosystems conservation and sustainable use of biological resources of the Carpathians" was held on this day. The plenary session started with musical greetings of the amateur orchestra of Hutsul folk instruments of the Rakhiv District House of Culture.

Further from the rostrum of the conference the participants were greeted by MPs of Ukraine of the 8<sup>th</sup> convocation Mykola Kniazhytskyi and Ivan Rybak.

The Director of the Department for Ecological Network and Protected Area System of the Ministry of Natural Resources of Ukraine Victor Klid continued the greetings. He noted the significant contribution of the Carpathian Biosphere Reserve in the development of nature conservation in Ukraine. In particular, he mentioned the initiation of listing the beech primeval forests of the Carpathian region to the UNESCO World Heritage List, as well as further development of this Property into the pan-European one (today – the Property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions Europe",



which includes 12 European countries). Also Victor Klid informed the audience of other significant achievements of the staff and administration of the Carpathian Biosphere Reserve, congratulated everyone on the anniversary, quoted the greetings from the Ministry of Ecology and Natural Resources of Ukraine, and awarded some of the staff members with honorary distinctions – the badge "Honorary staffer of nature conservation", namely: Director of the institution Mykola Rybak, head of zoological laboratory Yaroslav Dovhanych, manager of the Keveliv field division Vasyly Verbytskyi, driver Mykhailo Kozurak, as well as honorary certificates to the former Director of the reserve Dmytro Saik, Chief Accountant Hanna Belova, Head of the Ranger Service Mykhailo Prots, manager of the Chornohora field division Mykhailo Kostan, manager of the Department for scientific research and international cooperation Yuriy Berkela, and the Head of the botanical laboratory Mykola Voloshchuk.

Head of the Rakhiv District State Administration Pavlo Basaraba greeted the reserve and, on behalf of the Head of



**Musical greetings from the amateur folk orchestra of Hutsul folk instruments of the Rakhiv District House of Culture; Mykola Rybak, director of CBR, opens the international scientific conference; in the conference room – full house; Director of the Department for Ecological Network and PAS of the Ministry of Natural Resources of Ukraine V. KLID presents the departmental honorary certificates to the Director of CBR Mykola RYBAK; winter in the highlands... (during the field trip to the Chornohora protected massif); commemorative photo**





Zakarpattia Regional State Administration, presented honorary certificates of the Zakarpattia Regional State Administration to deputy-chief accountant O. Mozhzherova and senior researcher E. Liashenko. The chairman of the District Council Ivan Fabritsyi and the deputy head of the DSA Mykhailo Polazhynets came from the neighboring Tiachiv district to congratulate the participants of the conference. They awarded Director of the Reserve, Honored Conservationist of Ukraine M. Rybak, as well as the leading engineer V. Regush and the forest inspector of the Shyrokyi Luh field division with honorary certificates.

Mykola Stetsenko, President of the Ukrainian Protected Areas Association said a lot of warm words about the reserve, and mentioned the difficult moments of its development and formation. He also presented certificates to the following staff members: manager of the Department for economics and marketing Olena Yurkuts, scientists Vasyl Pokynchereda, Dmytro Sukharyuk, Victoria Gubko and manager of the Department for ecological education Victoria Bundziak. It should be noted that the Ukrainian Protected Areas Association also awarded the entire staff of the Carpathian Biosphere Reserve and separately its director M. Rybak with the honorary diploma.



Former Director of the Carpathian Reserve Dmytro Saik completed the welcoming block, after which the actual director Mykola Rybak declared the conference open and invited the scientific community to work, although, of course, he also could not refrain from welcoming words to the institution and its staff. He also thanked the representatives of the Ministry of Natural Resources of Ukraine, in particular the Deputy Minister of Ecology and Natural Resources of Ukraine Vasyl Polio and the Director of the Department for Ecological Network and PAS Victor Klid, for their comprehensive assistance not only in organizing the conference but also in its daily work. Acknowledgments were also addressed to the Ukrainian-German project "Support for nature protected areas



**During the Advisory Committee meeting of the Ukrainian-German Project "Support to the Nature Protected Areas of Ukraine"; a gift from the Roztochchia Nature Reserve is presented by the deputy director of the institution Halyna STRIAMETS; participants of the workshop for the protected area managers (central office of CBR, October 23, 2018)**

in Ukraine", which provided the necessary financial and organizational support to organize this glorious celebration. In particular, the Director cordially thanked the project implementation manager, Michael Brombacher, and his key team members Oleh Dudkin and Bohdan Prots. After that, the international conference went on in the usual mode – plenary and break-out sessions were held.

The presentations made during the conference by the participants reveal the role of the institutions belonging to the Protected Area System of Ukraine in research and conservation of the Carpathian natural resource potential, as well as the introduction of the concept of sustainable development. Historical aspects of nature management, formation of the protected areas and ecological network, study and monitoring of biotic and abiotic environment, problems of sustainable forest management, ecological aspects of sustainable tourism development and problems of forming ecological culture among the population were considered. As a result, the conference adopted a resolution.

In parallel with the scientific conference, a meeting of the Advisory Committee of the Ukrainian-German project "Support to the Nature Protected Areas of Ukraine" was held, which was attended by MPs, scientists, environmental experts and representatives of non-government organizations. During the first meeting, the members of the Committee became acquainted with the purpose and objectives of the project, the results of the activity and further plans. The participants of the meeting stressed on the importance of preserving the biological diversity of the protected areas and improving their management. A particular attention was paid to addressing issues of concern with the local communities and to strengthen the eco-educational component of the project.

During the afternoon session on October 23, 2018, a scientific-practical seminar for the directors of the Protected Area System of Ukraine was held at the central office of CBR, dedicated to acquaintance with the practical experience of the Carpathian Biosphere Reserve on the fulfillment of the main tasks defined by the current legislation for PAs. Director of the Carpathian Biosphere Reserve, Honored Conservationist of Ukraine Mykola Rybak spoke made his presentation to the participants of the seminar. At the end of the speech, there was a lively discussion on issues that concern all the protected areas of our country, in particular regarding obtaining permits on the use of natural resources, the procedure of the land tax payment staff structure issues, services on a fee-paying basis and more.

The participants of the seminar had an opportunity to get acquainted with the practical management of the Carpathian Biosphere Reserve, in particular with the functioning of the demonstrative trout nursery at the Trybushany field division, and the operation of the Eco-Educational Center "The Center of Europe".

On the following day, on October 24, the directors of the protected areas together with other participants of the anniversary events, together with Mr. Mykola Rybak in person, visited the territory of the Chornohora protected massif, where they got acquainted with the work mode of the Ranger Service. The staff of the institution, namely the Deputy Manager of the Department for Research and International Cooperation Vasyl Pokynchereda and the Head of the Forest Research Laboratory Myroslav Kabal vividly presented the results of the work which was carried out by our team, in particular, the transformation of spruce stands into close-to-nature forest sites on the 12 experimental plots in the Chornohora field division of CBR. The participants of the seminar got acquainted with the primeval forest area. Unfortunately, due to the whims of the weather, namely the arrival of this winter in the highland part of the massif, they could not climb the top of Hoverla Mt., but still had reached its foot!

During the final meeting, the seminar participants highly appreciated the work of the administration and specialists of the Carpathian Biosphere Reserve on the fulfillment of the main tasks that are relevant for all the protected areas of Ukraine. It is suggested that the Carpathian Biosphere Reserve in fact rather than in word is the flagship of nature conservation in Ukraine.

The anniversary events were finalized by the international round table meeting on the deepening of the cross-border cooperation of CBR, which took place on October 25 in the meeting room of the central office of the reserve. It was co-organized by our long-standing partner – the University for Sustainable Development from Eberswalde, Germany. The meeting was attended by scientists, environmentalists and university professors from Ukraine, Romania, Moldova, Germany and the United Kingdom. The round table meeting discussed a number of issues related, first and foremost, to the prospects for the development of cross-border cooperation in the Carpathian-Danube region, as well as the obstacles that occur in this process.

**Mykola RYBAK,**  
**Director of CBR, Honored**  
**Conservationist of Ukraine**

## MOMENT OF TRUTH: QUESTIONNARY ON OCCASION OF ANNIVERSARY



**Catalina BOGDAN,**  
**Director of the Maramures**  
**Mountains Nature Park**  
**(Romania)**

1. CBR is an important locality – a crossroad site that is a home for valuable species of flora and fauna, as well as habitats, which contributes to the conservation and protection of the biodiversity of the Carpathians.

3. Improving the visibility of CBR online and offline, developing rural / sustainable tourism, developing a policy of "refuse, reduce, reuse and recycle".

6. Celebration of the International Day of Parks (May 2013) with an exhibition of children's drawings, exchange of ideas and opinions during the scientific conference. Healthy food! (especially that wonderful beetroot soup – borshch)!



**RESOLUTION OF THE INTERNATIONAL SCIENTIFIC CONFERENCE  
"PROBLEMS OF MOUNTAIN ECOSYSTEM CONSERVATION  
AND SUSTAINABLE USE OF BIOLOGICAL RESOURCES  
IN THE CARPATHIANS"  
(Rakhiv, Ukraine, October 22-25, 2018)**

The International Scientific Conference was organized on the occasion of the 50<sup>th</sup> anniversary since creation of the Carpathian Biosphere Reserve. The conference organizers are the Carpathian Biosphere Reserve under the assistance of the Ministry of Ecology and Natural Resources of Ukraine.

The events related to the Conference were funded by the Ukrainian-German project "Support to Nature Protected Areas in Ukraine".

The Conference was attended by scientists, representatives of public authorities, environmental institutions and NGOs from Ukraine, Germany, Slovakia, Russia, Great Britain, Hungary, Switzerland, and Austria – about 130 people in total.

The Director of the Carpathian Biosphere Reserve Mykola Rybak greeted the participants of the conference, followed by the Director of the Department for Ecological Network and Protected Area Network of Ukraine Victor Klid, and the representatives of regional and district authorities as well as the foreign delegations.

At plenary sessions and during meetings of the sections "Research and monitoring of biotic and abiotic environment as a basis for conservation and sustainable use of natural ecosystems" and "The role of the protected area system in research and conservation of a nature-resource potential and in implementation of the sustainable development concept" the problems of mountain ecosystems preservation and sustainable use of biological resources of the Carpathians were raised, the role of the Ukrainian protected areas in research and preservation of natural resource potential and the implementation of the concept of sustainable development were discussed along with the issues related to some historical aspects of nature management, establishment of protected areas and formation of the ecological network, research and monitoring of the biotic and abiotic environment, some problems of sustainable forest management, and environmental aspects of sustainable tourism development along with the problems related to moulding population's ecological culture.

18 reports and presentations were made and discussed at the conference. The Conference Volume of Proceedings of 567 pages was published.

Based at the presented reports and the discussions held, the participants of the conference:

1. Note that during the fifty years of its existence, the Carpathian Biosphere Reserve has secured conservation of natural ecosystems, has achieved significant success in scientific research, environmental education and awareness rising. It has made a significant contribution into conservation of natural ecosystems and sustainable development of the Carpathians, as well as into creation of the ecological network and development of the system of nature conservation in Ukraine. The international recognition of these achievements is confirmed by the diploma of the Council of Europe.

2. Note that the Carpathian Biosphere Reserve is an active participant of the international cooperation processes due to such aspects as its geographical location, status of a MAB UNESCO biosphere reserve, presence of the UNESCO World Heritage Property on its territory, a significant share of employees who speak foreign languages.

3. Consider the expansion of CBR's territory from initial 12 600 hectares to over 58 000 hectares to be a great success of the Carpathian Biosphere Reserve's team, as well as establishment of a vast transition zone there, which has allowed the institution to meet the international requirements related to biosphere reserves; another big achievement of the reserve and its team, according to the conference participants, is designation of UNESCO World Heritage Property.

4. Consider that the main instrument to improve the ecological situation in Ukraine and its regions is the environmental component of the state regional policy. Ecological orientation of the territorial economic system development based on innovative approaches can give an impetus to the growth of strategic perspectives, including an extended reproduction of the environment with its ecosystems, protected areas, and nature sanctuaries.

5. Are convinced, that sustainable development of the society is possible only under the condition if the level of environmental education is increased, since it is an important means of moulding the ecological culture, consciousness and behavior of all the society members, and ensuring people's awareness as for the state of the environment. The way to increase ecological culture and consciousness is secured by an effective environmental education, which is provided by close interaction between protected areas and educational establishments.

6. Consider, that the main problems of mountain forests preservation in the Ukrainian Carpathians are the discrepancy between current forest site conditions for the existing forest types and types of forest stands, no correlation of logging methods with the forest types, a rapid decrease in the distribution range of spruce forests, and accumulation of significant stocks of dead wood in forests.

7. Are concerned with the pressure caused by business sector on natural complexes of the Tatra National Park (Slovakia) that threatens the very existence of the park.

8. Consider it to be appropriate to support the initiative expressed by Tymur Bedernichek and the co-authors on establishing an inter-departmental research center of highland/alpine zone – the Deyl center for alpine studies – on the basis of the Carpathian Biosphere Reserve and the National Botanic Garden named after M. Hryshko of the National Academy of Sciences of Ukraine, in the territory of the Pop-Ivan of Maramures mountain massif.

9. Express an opinion that 7 of the highest mountain peaks of the Chornohora Mountain Range should receive the highest national conservation status in Ukraine.

10. Call for an immediate cessation of continuous felling activities in those mountain forests that, as a result of scientific examination, can be recognized as primeval forests.

11. Consider it to be necessary to introduce basic vocational education on mountain farming with minimal damage to the nature of the Ukrainian Carpathians for local population of 4 mountain regions of Ukraine.

The participants of the conference express their gratitude to the Government of Ukraine for their significant role in preserving the unique ecosystems of the Carpathians, as well as to the Carpathian Biosphere Reserve's team for many years of persistent activities directed at conservation and research of natural values of the Carpathians, and for promoting international ecological cooperation on the European continent. Also, the participants express their gratitude to the administration of the Carpathian Biosphere Reserve for an excellent organization of this important international scientific forum.



**Alla KOZURAK,**  
*Senior scientist of the  
Botanical Laboratory  
of CBR*

5. In 2001, I was hired as a senior laboratory assistant to the phenology-meteorological laboratory. I had an interesting time among a group of like-minded people there. 17 years have passed in one breath. Great changes have taken place for me, connected to gaining significant experience and new knowledge. Daily communication with scientists who had already worked here, improved my skills a lot. The managers of the institution appreciate my desire to work and today I am a senior researcher at the Botanical Laboratory and a secretary of the Scientific and Technical Council. During this time I've also obtained a certificate from the European School of Correspondence Education in Landscape Design. The knowledge I've got is being actively used at work, including the improvement of the central office's yard, and the divisions of the reserve, as well as the town of Rakhiv and other institutions of the district. I coordinate botanical nursery of rare and ornamental species, which was created in 2009 at the headquarters of CBR. I've prepared 82 publications, 47 of which are scientific articles and 35 – popular science works.

Regarding the blueprint for the future, I hope to implement a program for improvement of the territory around the central office of CBR, the design project of which has been approved by the Scientific and Technical Council in 2015, and in its turn it will increase the tourist attractiveness, enhance the image of the reserve and promote CBR as a favorite recreation site for local residents and guests of the region.

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

6. There were many important events related to the activities held by CBR, including the first trip to the highland areas with the scientists, trips to various nature-conservation institutions abroad, gaining new experience, receiving various awards and more. But the most memorable one, I hope, will be the one related to my plans for the future.



**Oleh BORYK,**  
*Leading engineer of the  
Department for scientific  
research and international  
cooperation of CBR*

1. The role of the reserve is extremely important, first and foremost, for the Ukrainian Carpathians' nature conservation for future generations.

2. The most important achievement is the inclusion of CBR's primeval beech forests into the UNESCO World Heritage List.

3. The existing directions of activity need to be improved. It's important to restore the sauna and a swimming pool located at the central office and to establish a veterinary rehab center to provide help to both wild and domestic animals.

4. Advantages: the aesthetic pleasure of visiting natural complexes and sites; clean air, water... Disadvantages: low wages.

5. The win is that I work in a great team and do the job that I really enjoy.

6. A trip to Mala Uholka for a meeting dedicated to the expansion of the protected area network of Ukraine with the participation of the Minister of Ecology and Natural Resources of Ukraine O.M. Semerak (2016).



**Mykola HRECHUK,**  
*Deputy Director of CBR*

6. My native village of Iltsi in the Ivano-Frankivsk region, as well as the neighboring Kryvorivnia village, are glorified in folk songs and famous in legends. Such famous people as Ivan Franko, Mykhailo Kotsyubynskyi, Hnat Khotkevych came there to admire the Ukrainian spirit the nature... Here is good reason that Kryvorivnya is still called "Ukrainian Athens"!

Many a time had I been roaming around my native mountains and hills, but it was only in 2008 that I managed to hike to the highest peak of the Ukrainian Carpathian Mountains – Hoverla. Looking at the majestic panorama of the mountains, I felt truly free and happy. And yet – proud to be born and live in the midst of such an amazing beauty. Preserving it for the future generations is our most important task!



**FIFTY  
GLORIOUS  
YEARS**

**Greetings  
on the 50<sup>th</sup>  
anniversary  
of the  
Carpathian  
Biosphere  
Reserve**

КАРПАТСЬКИЙ  
БІОСФЕРНИЙ ЗАПОВІДНИК



## DEAR COLLEAGUES, FRIENDS!

50 years ago, on November 12, 1968, the Carpathian State Reserve (Zapovidnyk) was established, which subsequently formed two of the country's leading protected areas – the Carpathian Biosphere Reserve and the Carpathian National Nature Park. Thanks to the efforts of the employees of the institutions belonging to the Protected Area System of Ukraine, and with the support of local authorities and self-government bodies, as well as local population, scientific-educational and public organizations, we managed to preserve the most valuable natural areas of the Ukrainian Carpathians, to organize efficient nature-conservation, scientific, scientific, ecological, educational, recreational and international activities. The greatest international recognition has

become listing the most valuable natural sites of the Carpathian Biosphere Reserve into the UNESCO World Heritage List, which today unites 12 countries under the name "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe".

I sincerely congratulate the team of the Carpathian Biosphere Reserve and the Carpathian National Natural Park, the participants of the international scientific conference "Problems of mountain ecosystems conservation and sustainable use of biological resources of the Carpathians" on this glorious anniversary, and I wish all of you inspiration and new achievements in conservation and restoration of the flora, fauna and ecosystems, as well as sparkling energy and creative achievements in science and nature conservation, and also peace, good health, harmony and well-being!

**Vasyl POLUIKO,  
Deputy Minister of Ecology  
and Natural Resources of Ukraine**

## TO THE DIRECTOR OF CBR M. RYBAK AND DEPUTY DIRECTOR ON SCIENTIFIC RESEARCH PROF. F. HAMOR

Dear Mr. Mykola Rybak and Mr. Fedir Hamor! We sincerely congratulate you and all your team members on the glorious 50<sup>th</sup> anniversary and send you greetings on behalf of the numerous staff members of the Institute of Ecology of the Carpathians of the NAS of Ukraine and the Lviv Branch of the Ukrainian Botanical Society.

The Carpathian Biosphere Reserve is associated with a whole era of nature protection and biodiversity conservation development in the Carpathian region, both nationally and internationally. Proof of this is the important international achievement – designation of the UNESCO World Heritage Property. Through consistent and tireless work, the Carpathian Biosphere Reserve has achieved numerous high scientific and educational results, becoming a major center for eco-education for numerous generations of young people. The Reserve has become a scientific-practical training center, where numerous doctoral and PhD theses, scientific and popular science monographs have been prepared, as well as many articles and other works. The

Reserve itself is a powerful scientific research center, the importance of which is recognized not only in Ukraine, but also far beyond the borders of our country. We are pleased that during all these years, there has been an atmosphere of sincere commitment and assistance in preparation of scientific papers, mutual experience exchange, and providing good advice and support in the difficult field of nature conservation between our institutions.

We sincerely wish, dear Mr. Rybak and Mr. Hamor, to all of your staff members lots good health, inexhaustible creative energy, new successes in environmental, organizational, ecoeducational and scientific activity, as well as happiness, well-being and prosperity!

**Mykola KOZLOVSKYI,  
Director of the Institute,  
Corresponding Member of NAS of  
Ukraine, Doctor of Biological Sciences;  
Alexander KAHALO,  
Vice-President of the Ukrainian  
Botanical Society, Chairman of UBS  
Lviv Branch, Candidate of Biological  
Sciences, Senior Researcher**



## DEAR FRIENDS AND COLLEAGUES!

The staff of the Institute of Geology and Geochemistry of Combustible Minerals of the NAS of Ukraine sincerely congratulates the team of the Carpathian Biosphere Reserve of the Ministry of Ecology and Natural Resources of Ukraine on the 50<sup>th</sup> anniversary of its foundation!

We would like to express our deepest gratitude and appreciation to the whole staff of the Carpathian Biosphere Reserve. We are confident that this anniversary will give you the strength and inspiration to continue with honor, on a high professional level, for countless centuries fulfilling this honorable mission – development of ecological foundations and preservation of natural ecosystems in the Carpathian region, working in the field of ecological education, awareness rising and culture.

We are sending you warm greetings and wishes of moving forward steadily, as well as fortitude, optimism, creative inspiration, new great successes in scientific activity, in all of your deeds and endeavors. Let your professional activity be filled with pleasure and creative victories. We wish that the basis of your happy life and fruitful activity become good health, inspired thoughts, sincere feelings and a heart filled with love and goodness! Go ahead to the new achievements for the sake of native Carpathians and independent Ukraine! May God help us!

Yours sincerely, on behalf of the staff of the Institute of Geology and Geochemistry of Combustible Minerals of NAS of Ukraine

**Myroslav PAVLYUK,**

**Director of the Institute, Honored Scientist and Engineer of Ukraine, Academician of NAS of Ukraine**

## DEAR LADIES AND GENTLEMEN

The Board of Directors of NGO "Center for Promotion and Development of UNESCO Programs and Projects in Lviv Oblast" (the Department of the International Center for the Implementation of UNESCO Programs in the Field of International Relations and Development of the Newest Technology) sends warm greetings to the staff of the Carpathian Biosphere Reserve and its Director, Honored Conservationist of Ukraine Mr. Mykola Rybak, on occasion of the 50<sup>th</sup> anniversary of the institution. Greetings are joined by friends and partners from the Regional Nature Parks of Italy, namely: Regional Nature Park "Bracciano Mar Tignano"; Campo Soriano Regional Nature Park and Temple of Jupiter Ansur; Monti Sembruni Regional Nature Park; Monti Navenia and Cervia Regional Nature Reserve; Regional nature Reserve Monte Della Duessa.

**Ihor MELEKH,**

**Director of the Board of Directors of NGO "Center for Promotion and Development of UNESCO Programs and Projects in Lviv Oblast"**

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY



**Vitalina LUKYANOVA,**  
**PhD in chemistry,**  
**Associate Professor**  
**of the Department**  
**of Ecology and Life Safety**  
**of the National Transport**  
**University of Ukraine, Kyiv**

1. The Carpathian Biosphere Reserve is certainly a pearl among a number of protected areas of the World. Now it is 50 years old. Is it a lot or not – it's hard to say. During this time, CBR has been performing and continues to perform a number of functions entrusted to the institutions of this type. In particular, it is the protection of natural territories from anthropogenic impact, recreational function, as well as environmental, educational, scientific and cultural ones.

2. CBR can be safely called "the lungs of Ukraine", and in its great spaces, thanks to highly qualified employees, rare species of flora and fauna remain preserved. The scientific work conducted by the scientists is known far beyond our country, which allows involving international environmental institutions and well-known foreign scientists to cooperation.

In my opinion, the main achievement of the staff of the Carpathian Biosphere Reserve is bringing the territorial structure and functional zonation of CBR in compliance with the requirements of the World Network of Biosphere Reserves.

3. Technologies for sustainable use, conservation and enrichment of bio

resources, biodiversity conservation; problems of protection and enrichment of rare plant and animal species' gene pool; to continue active development of ecotourism and eco-education activities.

6. When you come to Zakarpattia, the first thing that strikes you is your travel there, when even from the train one can enjoy the picturesque scenery. The beauty of the mountains captures, elevates your mood and inspires. Everyone, looking out of the window, just admire the beauty of the nature of Ukraine, and feel that it is love at first sight and for the life term. So, in June 2018, together with the students of specialty 101 "Ecology" of the National Transport University, I visited the Carpathian Biosphere Reserve for scientific internship. For this purpose, we selected two groups of students and three locations of CBR, namely: "Narcissi Valley" – the protected massif named after prof. Vasyl Komendar, the Uholka field division with the information center the "Carpathian Primeval Beech Forests as a UNESCO World Heritage Property", and the central office of the Carpathian Biosphere Reserve. During the internship, students got acquainted with the structure, functions and directions of the scientific work of CBR, listened to lectures given by the leading scientists, and passed a number of eco-training sessions.

What I remembered the most, oddly enough, were the emotions of the students when they saw the spotted salamander living in the Carpathian beech forests. Also the students' impressions of climbing Hoverla Mt. were unforgettable.

# GALLERY OF THE CARPATHIAN BIOSPHERE RESERVE'S VETERANS

## HONOR AND PRIDE OF CBR

The best years of life and the passion of their young hearts were given by our dear veterans to the Carpathian Biosphere Reserve. From day to day you keep diligently performing and the difficult tasks in the sphere protection of the Ukrainian Carpathians, often showing courage and heroism, high professionalism, perseverance and dedication in work. On behalf of the whole team, I sincerely thank you for your understanding, invaluable contribution to the formation and development of the Carpathian Biosphere Reserve, and for multiplication of its glorious traditions, achievements and results.

Wishing good health to you and your families, as well as well-being and fulfillment of dreams and ideas!

**Mykola RYBAK,**  
Director of CBR,  
Honored Conservationist  
of Ukraine



**Vasyl SAS**

Was working at CBR since 1974. Took positions of a forest ranger, master-forester of the Chornohora forestry, and nature conservation inspector of the Chornohora field division. Today – retired



**Dmytro SAIK**

Worked at the Carpathian State Reserve from 1975 till 1978 as a Director, and later – as the head of the Ranger Service Department  
Today – retired



**Dmytro SUKHARYUK**

Worked at the reserve from 1975 to 1985 in various positions, including Deputy Director on scientific research. Since 2000 – back to the reserve, now – Senior Researcher of the Forest Research Laboratory



**Dmytro KURIN**

Worked at the reserve since 1977. Took the positions of: manager of forestry district, Leading engineer of The Ranger Service.  
Today – retired



**Heorhiy LAZUTKIN**

Worked at the reserve since 1977. Took different positions, including Head of the Laboratory of forest and landscape research.  
Today – retired



**Vasyl KHYMYNETS**

He has been working in the reserve since 1977, worked as a fire-preventing watchman, a forest ranger in the Uholka field division. Currently – nature conservation inspector of category 1 of the Uholka field division



**Mykhailo KOZURAK**

He has been working at the reserve since 1979. Used to work as a builder of 2<sup>nd</sup> category. Now he is a driver of the 1<sup>st</sup> category at the transport and energy section of CBR



**Yaroslav DOVHANYCH**

In the reserve – since 1980, worked in various positions, including the Deputy Director on Scientific Research. He is now the head of the zoological laboratory



**Mykola DEMIANCHUK**

He has been working in the reserve since 1980. Worked as a forest ranger, master-forester, game fauna warden of the Shyrokyi Luh field division. Now he is a master-ranger on nature conservation of the Shyrokyi Luh field division



**Vasyl HENDYCH**

He has been working in the reserve since 1980. He worked as a fire-preventing worker, logger, forest ranger of the Shyrokyi Luh field division. He is now a nature conservation inspector of the 1<sup>st</sup> category of the Shyrokyi Luh field division



**Ivan TSIRYK**

Has been working in the reserve since 1980 as a worker, forest ranger of the Shyrokyi Luh field division. He is now a nature conservation inspector of the 1<sup>st</sup> category of the Shyrokyi Luh field division



**Olena BABYCH**

She has been working in the reserve since 1981 as a forest ranger of the Uholka field division, a forest ranger of the Narcissi Valley division. Now she is now a nature conservation inspector of the 1<sup>st</sup> category of the "Narcissi Valley" field division



**Nadia ZAHAROVYCH**

She worked in the reserve since 1981 in various positions, including technician, library manager, leading accountant. Now – retired



**Petro NYKIRKA**

In the reserve since 1981. Worked in the positions of a lumberjack, a part-time worker, a driver, a carpenter in the Bohdan-Petroske field division. Now he is the watchman in the Bohdan-Petroske field division



**Yevhen LIASHENKO**

He has been working in the reserve since 1982 as a senior laboratory assistant, a researcher at the zoological laboratory. He is now a Senior Researcher at the Zoological Laboratory



**Mykola RYBAK**

He has been working in the reserve since 1983 in the positions of a forest ranger, a forest master-ranger, deputy manager of forestry district, an engineer of forest department, manager of forestry district, forester, first deputy director. He is now the director of CBR



**Hanna PROTS**

Worked at the reserve since 1984 in the positions of an economist, a leading accountant, a deputy chief accountant, a chief accountant. Today – retired



**Vasyl REHUSH**

In the reserve since 1984. Worked in the positions of forest master-ranger, a forest ranger, chief forester, manager of the Uholka field division, manager of the Department for natural ecosystems restoration and conservation and use of natural resources. Today – leading engineer of the Department for scientific research and international cooperation



**Tetiana REHUSH**

At the reserve since 1984. Occupied different positions: deputy chief forester, deputy manager of the Uholka field division, leading engineer of the Ranger Service. Today – 1<sup>st</sup> category technical laboratory assistant of the Botanical Laboratory



**Vasyl POKYNCHEREDA**

He has been working in the reserve since 1985 occupying different positions: deputy director on scientific research, head of the Laboratory of forest and landscape research. He is now a deputy manager of the Department for scientific research and international cooperation



**Mykhailo PROTS**

Has been working at the reserve since 1985 in different positions: engineer, master forest ranger, deputy chief forester, deputy manager of the Ranger Service. Today – manager of the CBR's Ranger Service



**Maria KOZURAK**

Has been working in the reserve since 1985 as a cleaner



**Tetiana ANTOSIAK**

Has been working at CBR in different positions: senior laboratory assistant of the scientific department, herbarium keeper, a researcher at the botanical laboratory. Today – senior researcher of the botanical laboratory



**Ivan OLEKSIY**

Has been working at the reserve since 1986 as a forest ranger at the Shyrokyi Luh field division. Today – nature conservation inspector of the 1<sup>st</sup> category at the Shyrokyi Luh field division



**Fedir HAMOR**

Director of the Carpathian Biosphere Reserve from 1987 till 2013. Today – deputy director on scientific research



**Vasyl DZHUHAN**

In the reserve since 1988. Worked as a carpenter, driver, forest ranger, forest master-ranger of the Shyrokyi Luh field division. Now he is a master ranger on nature conservation of the Shyrokyi Luh field division



**Vasyl DRAHUN**

In the reserve since 1989. Worked as a forest ranger of the Shyrokyi Luh field division. Now he is a 1<sup>st</sup> category inspector on nature conservation of the Shyrokyi Luh field division



**Yuriy OBRETSKYI**

Has been working at the reserve since 1989 as a driver, a forest ranger of the Chomohora field division. Today – is a 1<sup>st</sup> category inspector on nature conservation of the Bohdan-Petroske field division



**Petro POKOVBA**

Has been working at the reserve since 1989 as a fire-prevention watchman, a forest ranger of the Shyrokyi Luh field division. Now he is a 1<sup>st</sup> category inspector on nature conservation of the Shyrokyi Luh field division



**Roman KUZMINSKYI**

Has been working at the reserve since 1990 as a forest ranger, chief forester, head of the Department for nature use and economic activity Manager of the Chornohora field division. Today – Deputy director on nature conservation



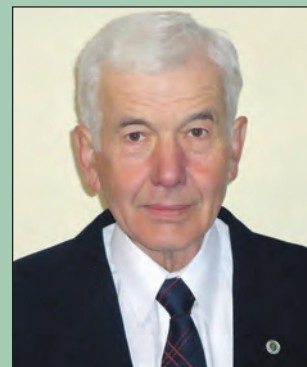
**Oronka MOZHZHEROVA**

Has been working at the reserve since 1990 as an office secretary, dispatcher, cashier, accountant, leading accountant. Today – Deputy chief accountant



**Vasyl SHEMOTA**

Has been working at the reserve since 1991 as a forest ranger, forest master-ranger, chief forester. Today – manager of the Bohdan-Potroske field division



**Vasyl KOKISH-MELNYK**

Has been working at the reserve since 19912 as a Deputy Director on logistics, manager of the sawmill section, forester assistant, the deputy manager of the Bohdan-Petroske field division. Today – retired





**Dr. Pierre IBISCH,**  
**Professor, University**  
**of Sustainable Development,**  
**Eberswalde, Germany**

1. CBR has become a champion of the European conservation process, especially known for its contribution into the protection of primeval and ancient beech forests. The activities related to designation of the primeval and ancient beech forest UNESCO World Heritage Property have initiated a pan-European process that has greatly increased public attention to these forests. There is now enormous potential to develop an appropriate environmental policy. CBR has become a very important actor and a model that proves that environmental activities can be used as a catalyst for cross-border and international cooperation.

2. In addition to significant achievements in the context of designation, promotion and expansion of the UNESCO World Heritage Property, CBR has "placed the Ukrainian forests on the global map". It is exactly thanks to CBR the importance of the Carpathian ancient forests is so well known in Europe and beyond. It is also related to the development of a special tourism trend, and the related socio-economic benefits for the region. The reserve is also known for its contributions to organizing and conducting global forest research. It is commendable that CBR has initiated the active involvement of the local population and communities in fulfilling all the functions attributed to a modern biosphere reserve.

3. This is a significant challenge – to make a positive impact on

## MOMENT OF TRUTH: QUESTIONARY ON OCCASION OF ANNIVERSARY

the ecosystem-oriented sustainable development of the region by supporting local and national actors. I guess it might be a good idea to keep good relationships with people, working together and managing the territory for the sake of nature conservation, providing all the necessary goods and services that shape the region and its cultural identity. It would also be great to learn new governance models that fully embrace intense dialogue with people and engage them in an active decision-making process.

6. It's really hard to answer this question, because there have been so many great moments over the years. This includes unforgettable impressions of nature and people. Of course, there will always be a special memory of how we somehow got lost in the woods with a fairly large group of students, and we had to wander through the forest for a long time without knowing a clear direction. I am convinced, that for students and for most of us, this experience has provided a kind of "new orientation" and has helped to reconnect even more deeply with the Carpathian nature.



**Hanna BELOVA,**  
**Chief Accountant –**  
**Head of the Accounting**  
**and Financial Reporting**  
**Department of CBR**

6. For me, the most important event related to the activity of CBR was being hired to this institution. First meetings with people of science, who are deeply committed to their profession, with a

creative approach to anything they do. I believe that in the near future their work will become truly prestigious and well- paid.



**Hennadyi BOCHKOR,**  
**Senior engineer,**  
**the Department for**  
**scientific research and**  
**international cooperation**

1. Preservation of typical natural complexes of the Carpathians in order to provide necessary ecological conditions for the existence of the population in the area of its activity by forming an ecological and socio-economic way of thinking and distributing these practices to other regions of the Carpathians.

2. Expansion of the territory of the reserve; introduction of the ecological and socio-economic model of development in program documents of the region and administrative districts in the area of the reserve's activity.

3. To study the structure of the energy and geological resources stock in the territory of the reserve; to study the recreational potential on the territory of the reserve.

4. Conservation of natural complexes of the biosphere; introduction of a model of environmentally friendly behavioral process for members of territorial communities; limiting management of the natural resources, in connection with the conservation of natural territories before restructuring income for the members of territorial communities associated with this process.

6. Elaboration of the Spatial Planning Documentation for Rakhiv district by the Rakhiv DSA and Rakhiv District Council, recommendations for which were prepared by me.



**Iryna YONASH,**  
**Deputy Manager of**  
**the Department for**  
**recreation and sustainable**  
**development of CBR**

3. It would be great if we had the opportunity to create our own brand of organic products, which is quite popular and widely used in European national parks and reserves. This would help us to earn additional income for the development of the institution, for collaboration with local small-scale farmers, as part of the promotion of sustainable development ideas.

4. On the one hand, being a guard of the Carpathians is an honorable mission and a large part of responsible population understands and appreciates it, however, until we reach the European level of environmental awareness, this mission will always cause dissatisfaction with pragmatically focused, short-sighted entrepreneurs who see in the reserve only an obstacle to accessing the desired resources.

5. Thanks to CBR and the experience gained from working with both the institution and its partners, I would like to point out a significant

increase in personal language skills and a broader outlook. That is why the plans for future are unchanged – to keep developing as an individual in this direction, which is mutually beneficial both to me as a person, and the institution.

6. There were many interesting events: vivid memories of visiting the striking karst formations of Uholka, surrounded by the largest and oldest beech primeval forests in Europe; hiking to the forests of Chornohora and the official opening of the Carpathian Highlands Tourist Information Center; however, the most memorable event is the hike to Pip-Ivan of Maramures Mt. during the blooming season of rhododendron, as well as wandering through the forests in the mist on our way back...



**Iryna SHCHOKA,**  
**fundraising manager**  
**of the European**  
**Wilderness Society,**  
**Uzhgorod**

1. A role-model in research and conservation of unique mountain landscapes.

2. Collaboration with international environmental organizations, in particular the European Wilderness Society; support for local businesses (sheep farming, trout farming, etc.).

3. To promote in importance of protected areas and sustainable tourism within their areas, as well as traditional

practices of nature resource management jointly with local active citizens, entrepreneurs, as well as foreign neighbors (for example, Romania, Hungary).

4. Disadvantages: The need to be flexible, taking into account the interests of many stakeholders. Advantages: Professional and active staff who understand the importance of maintaining the unique ecosystems of the reserve.

5. Starting the wilderness education in Ukraine based on the experience of the European Wilderness Society and my own experience. Plans – continuation and expansion of this activity; participation in the development and publication of the Wild Five magazine, followed by its active further distribution.

6. A study tour organized for a team member of CBR Mykola Romanyuk to the USA to participate in the wilderness rangers' professional training in 2018.

КАРПАТСЬКИЙ  
БІОСФЕРНИЙ ЗАПОВІДНИК



**AFTERWORD  
TO THE ANNIVERSARY  
SPECIAL ISSUE  
OF THE MAGAZINE  
"ZELENI KARPATY" /  
"GREEN CARPATIANS"**

Centre for Econics  
and Ecosystem Management:  
*Prof. Dr. Peter R HOBSON,*  
*Writtle University College, United Kingdom;*  
*Prof. Dr. Pierre LIBISCH,*  
*Eberswalde University*  
*for Sustainable Development, Germany*

**CARPATHIAN BIOSPHERE RESERVE  
AS ONE OF THE MOST IMPORTANT  
AND INFLUENTIAL PROTECTED AREAS  
IN EUROPE**





**B**iosphere reserves are internationally significant instruments for nature conservation, scientific research, and the exploration of new pathways towards sustainable development. The concept emerged with the aim of preserving, in their original state, representative examples of natural complexes of the biosphere; and for carrying out environmental monitoring and research of the natural environment to help secure environmental conditions while allowing for its sustainable use. The Carpathian Biosphere Reserve (CBR), together with the transition zone of 136,900 hectares, covers an area of over 195,000 hectares and is one of the largest biosphere reserves in Europe. Today, it is also one of the largest protected areas in Ukraine that is tasked with safeguarding unique natural and anthropogenic landscapes from the Transcarpathian foothills up to subalpine and alpine zones of the Ukrainian Carpathians. CBR is a member of a family, including internationally recognized biosphere reserves such as the Black Sea BR (109,254 hectares, the marine area of which is 89,129 hectares); Askania-Nova (33307 ha); Danube (50252 ha); Carpathian BR (58025 ha); Polish-Slovak-Ukrainian East Carpathians TBR (it includes the Uzhanskyi NPP – 39159 hectares and the Nadsianskyi RLP – 58587 hectares); Ukrainian-Belorussian-Polish TBR "Western Polissia" (it includes the Shatskyi NPP – 48,997 hectares, the transboundary NPP "Desna" – 58,293 hectares, and the Roztochchia biosphere reserve – 74,416 hectares); The Chernobyl radiation-ecological biosphere reserve – 226964 ha.

The CBR is a show case for natural diversity. There are recorded 1,779 species of vascular plants, 806 species of lichens, 436 algae species, 980 species of fungi, 66 species of mammals, 193 species of birds, 9 species of reptiles, 15 species of

amphibians, 29 species of fish and more than 3,000 species of invertebrates. In 2012, for the outstanding achievements in preservation and research of the natural complexes of the Ukrainian Carpathians, the Council of Europe awarded the Carpathian Biosphere Reserve with the European Diploma for Protected Areas. But the most important achievement of the CBR, and in terms of its contribution to international conservation, was the creation and expansion of the UNESCO World Heritage Site, where primeval beech forests of the reserve (an area of almost 21 000 hectares) constitute its largest component part. More than 22% of the territory of pan-European UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and other regions of Europe", is protected within the CBR. By proposing and promoting this serial site, which is the largest and most complex of its kind in the World, CBR has become a global champion of oldgrowth forest protection, and also of transnational cooperative conservation of biodiversity. Today, it is also a reference site for understanding the relevance and functionality of oldgrowth forests.

On November 23<sup>rd</sup> 1993, the reserve received the status of a biosphere reserve and entered the UNESCO World Network of Biosphere Reserves. At that time, the Law "On the Protected Area System of Ukraine" was already in force, and was responsible for regulating all the aspects of the biosphere reserve activities. The Law provided protection, restoration and use of the biosphere reserve's natural complexes in accordance with the functional zoning of its territory.

According to the MAB UNESCO Program, the World Network of Biosphere Reserves is intended to fulfill the following tasks:

- to ensure conservation of the natural ecosystems that are representational for the biogeographic regions of the Earth and which play the role of reference models;



**Peter R. HOBSON  
and Pierre L. IBISCH  
at the International Seminar  
"Role of the UNESCO Man  
and Biosphere Program  
in Conservation  
and Exploration of Natural  
and Cultural Values of Europe".  
Carpathian Biosphere Reserve,  
Rakhiv (Ukraine),  
May 26, 2016**



**Professor Pierre L. IBISCH  
with his Moldovan  
and Ukrainian colleagues  
on the Krasna Mountain Ridge  
(Tiachiv district of Zakarpattia  
region) during the student  
study tour held  
by the University of Sustainable  
Development, Eberswalde,  
Germany. June 5, 2019**

- to promote the re-naturalization of degraded landscapes;
- to create favorable environmental conditions for plant and animal species gene pool conservation;
- to encourage spontaneous development of ecosystems in their natural environments;
- to provide a scientific basis for comparative studies of both natural and cultural ecosystems as well as for transformed ecosystems and their response to various types of anthropogenic impacts;
- to substantiate environmental principles in natural resource management and the optimization of the natural environment;
- to ensure the on-going monitoring of natural and cultural ecosystems in the light of technogenic impact;
- to maintain ecological balance in the regions of BRs location;
- to promote environmental education of the population;
- and finally, to ensure the continuation of international co-operation in the sphere of environmental protection.

In order to ensure the implementation of their environmental, economic, and social objectives, the territory within biosphere reserves is divided into three zones that are different in their functionality: the core zone of a BR; buffer zone around the core area; and the transition zone (for management activities). The strictly protected core area includes the ecosystems representational for a certain biogeographic region that

are ideal for carrying out long-term environmental research, and for the monitoring of natural processes. The core area's ecosystems serve as natural reference models for shaping strategies and management practices in surrounding cultural ecosystems within BRs' transition zone. The largest and most diverse in its purpose is the transition zone of biosphere reserves, which includes various agricultural, forestry and water management areas with traditional management of natural resources. This zone may include both transformed and degraded sites that are worth to be re-cultivated for restarting management there.

In 2016-2017, the administration of the Reserve signed declarations on cooperation between the biosphere reserve and a number of town and village councils that were to be incorporated into the transition zone of CBR. The purpose of the declarations is enshrined in the principles of biosphere reserves, namely, to promote a community-

based approach to managing natural and cultural landscapes in a sustainable manner as required by the UNESCO Man and Biosphere Program. Declarations on cooperation were signed with the territorial communities of Rakhiv and Tyachiv districts of Transcarpathian (Zakarpattia) region, covering a total area of 136.900 hectares, which makes CBR one of the largest biosphere reserves in Europe. The ecological benefits of this recent development are immediately obvious. Instead of the previously fragmented landscape, the Reserve can now boast much higher ecological connectivity and integrity with a greater chance of providing the right conditions for the existence of viable populations of large predators, specifically, bear, wolf and lynx. It is important to note that the territory of the transition zone includes a significant part of the ecological network of Transcarpathian region.

According to the declaration, local communities enjoy certain privileges including free-of-charge nature use activities in the zone of

anthropogenic landscapes, such as hay mowing, cattle grazing and foraging for mushrooms and berries for their own use. The Reserve also gives fire wood at subsidized prices for both heating and as a source of construction timber needed to maintain highland polonyna farms. The CBR also provides much needed employment opportunities for local population.

For performing its functions, CBR has promoted a programme of eco-education at both local and national levels, which is implemented and coordinated by several departments: the Department for Ecological Education, the Department of Recreation and Sustainable Development, and the Editorial and Publishing Department, created for scientific and popular science publications. A solid infrastructure for the implementation of eco-educational and recreation activities has been developed. As far back as 1994, an ambitious project to create an eco-



**View on Petros Mt. (Chornohora protected massif)**



## Uplands in mist

education center – the Museum of Mountain Ecology and History of Nature Use, was initiated, and to this day it has no equal rival across the Ukraine. Currently, there are three eco-education centers (the above-mentioned Museum of Mountains Ecology, the Museum of Narcissus and the visitor center in the Center of Europe) and four tourism information centers ("Carpathian Highlands", "Keveliv", "Carpathian Trout", "Primeval Beech Forests as the UNESCO World Heritage Site"). In addition, there are also 18 ecotourism trails.

Raising public awareness of the importance of CBR activities, staff and management team also contribute regularly to issues of the All-Ukrainian Ecological Popular Science Journal *"Green Carpathians"* (Zeleni Karpaty), as well as contribute to published articles in the "Newsletter of the Carpathian Biosphere Reserve" and also regularly provide information updates in a range of booklets, leaflets, tourism maps, calendars and other handouts. At a more academic level, over the

years, the Reserve has organized numerous international scientific conferences and has participated in the implementation of numerous international scientific projects. In 2016, a new journal, "Nature of the Carpathians" was launched, published jointly by CBR and the Institute of Ecology of the Carpathians of the National Academy of Sciences of Ukraine (Lviv).

By establishing relevant infrastructure and having a staff of highly qualified specialists, CBR has become a home base for top level scientists studying the structure and dynamics of old growth forests, and also a training ground for thousands of students coming from all continents to experience the extraordinary ecosystems. Institutes, such as the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), University of Vermont, or Eberswalde University for Sustainable Development were attracted to Ukraine by CBR nature, the technical and human quality of the staff, and the hospitality of the region. Many tourists from Central and Western Europe have found their way to Ukraine thanks to the work of CBR. Therefore, without any exaggeration, it can be stated that CBR has

become a top-ranking model Biosphere Reserve: It serves the local population, fosters regional development, safeguards unique biodiversity, and inspires international conservation.

The achievements of the CBR staff over the last fifty years have provided an excellent fundament for the future development and ambitious goals for the future. Key challenges of the present day are related both to sustainable and ecosystem-based sustainable development of the region in times of rapid environmental change and increasing economic and socio-political pressures, as well as to a continued transnational cooperation in biodiversity conservation, with a special emphasis on transboundary cooperation with neighboring territories. CBR has become a nature landmark in Central Europe, and a motor of conservation-based diplomacy. To continue its successful mission, CBR will require the ongoing support from both national and international partners, as well as local stakeholders; and will also forge new exciting partnerships across all levels of operation.

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**CARPATHIAN BIOSPHERE RESERVE:  
HISTORY OF ESTABLISHMENT, ACHIEVEMENTS, PRIORITIES, PERSPECTIVES**

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- 2 p. of the cover: highland mountain lake in the Svydovets mountain massif;  
Narcissus angustifolius in the Svydovets protected massif.**
- 3 p. of the cover: Crooked-woodland on Pip-Ivan of Maramures Mt.;  
Primeval beech forests in the Uholka-Shyrokyi Luh protected massif.**
- 4 p. of the cover: The team of the Carpathian Biosphere Reserve during the celebration  
of the Day of protected area system of Ukraine (July 7, 2018)**

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