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F E D E R A T I O N



# **ALPINE TUNDRA OF THE KRKONOŠE AND CARPATHIAN MOUNTAINS**

**Report on study tour funded by  
Alfred Toepfer Natural Heritage Scholarship 2016**

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Nastia Kipish is the one who made this report much more readable by ruthless eradication of the present perfect, choosing the correct prepositions, introducing commas and much more. Thank you, Nastia!

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## CONTENTS

About the author .....	5
<b>PART I. INTRODUCTION .....</b>	<b>6</b>
Objectives of the study tour .....	7
Overview of the study tour .....	8
Short description of the protected areas visited .....	10
<b>PART II. ANALYSIS .....</b>	<b>15</b>
Past and modern human impacts on subalpine and alpine ecosystems .....	15
Conserving alpine environments in the European Union and in Ukraine .....	22
Historical background: Strict nature reserves in Ukraine .....	22
Nature conservation in alpine environments in Ukraine, Poland and Czech Republic ..	23
INTERACT and GLORIA in Ukraine: perspectives and difficulties .....	28
<b>PART III. CONCLUSIONS &amp; RECOMMENDATIONS .....</b>	<b>33</b>
References .....	35
Annex A .....	36

## About the author

My name is Tymur Bedernichek, and I am a postdoctoral researcher at the M.M. Hryshko National Botanical Garden (Ukraine). The very first book I read in my life was *Three tickets to Adventure* by Gerald Durrell. This left me almost no chance to become anything else but ecologist and nature conservationist.

During my University years, I was an environmental activist. Together with other students, we founded an environmental NGO. I took part in hundreds of operations against timber thieves and poachers, spiked trees and brought to justice foresters who intended to cut down an old-growth oak forest in the Upper Dniester basin.

After seven years of environmental activism, I realized that having two letters – Dr. – before your name really matters, especially in post-Soviet countries. Here, it is not enough to be a professional and passionate person. You need to have at least a doctoral degree, because most of your opponents do.

In 2013, I defended a dissertation on the impacts of different types of forest felling on soil carbon stock and showed that intensive forest felling causes significant emission of carbon dioxide into the atmosphere. My previous and ongoing research projects focus on soil as one of the largest carbon reservoirs on the planet. It contains more carbon than the biosphere and atmosphere together and is one of the most important components of carbon balance.

Unfortunately, forest ecosystems are both complex and complicated, and it is usually very difficult to develop informative models of carbon turnover for them. After several unsuccessful attempts, I started looking for better objects for modeling purposes. “In physics, they have ideal gas. There should be ideal soil somewhere,” – I thought.

I found such “ideal soil” in tundra. Both polar and alpine tundra ecosystems are fragile environments, vulnerable to global climate changes and ideal for modeling. Luckily, one of the very best places for such studies was located in the Carpathian Mountains, on the Ukrainian-Romanian border. In 1930s, famous Czech ecologist Miloš Deyl conducted precise studies of plants, soils and climate of the region. This gives us a unique comparison base: we know what it was like there before global climate change! Repeating his studies will tell us what it is like today and what has changed over this rather long period of almost 90 years.

However, many questions have arisen. How do other people conduct research in alpine zones? Are there any successful examples in the Carpathians and the nearby mountain systems? How do administrations of protected areas collaborate with researchers in such environments? Are there any international networks of alpine research stations and international monitoring projects?

I found out that three protected areas, which are members of EUROPARC FEDERATION — Krkonoše National Park (Czech Republic), Karkonosze National Park (Poland) and Tatra National Park (Poland) — operate alpine research stations. I HAD to visit them! They were the references I was looking for!

That is why I applied for Alfred Toepfer Natural Heritage Scholarship, which became my ticket to Adventure.

## Part I. Introduction

High-mountain ecosystems, including subalpine and alpine tundra, are fragile and extremely sensitive to global climate change. They have been formed in a cold environment with harsh winters and a short growing season. Most species and entire communities at high altitudes are stenotherm. It means that they feel comfortable in a narrow range of temperatures and suffer when temperatures increase significantly, especially during summers.

Almost the same processes can be observed in zonal tundra ecosystems in the Arctic and the Antarctic. However, in high-mountain environments, all changes to the structure and functioning of terrestrial ecosystems, in my opinion, are even more significant than in the Polar Regions. The matter is that the subalpine and alpine zones are very narrow in comparison to the polar tundra biomes and therefore they react much quicker to stress.

The monitoring of tundra environments is vitally important to track the changes that are not yet noticeable in other biomes, but may become very soon. For this purpose, several international projects and networks have been launched. I will mention here only the three most important ones:

i) Interact International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT): <http://www.eu-interact.org>

ii) Global Observation Research Initiative in Alpine Environments (GLORIA): <http://www.gloria.ac.at>

iii) International Tundra Experiment (ITEX): <http://ibis.geog.ubc.ca/itex>

The purpose of all those networks and projects is *to observe*, which will help in the nearest future *to predict*. Unfortunately, *none* of them is represented in Ukraine...

There are several high-mountain research stations in my country, but they do not participate in such programs and exist in a kind of a parallel dimension: isolated, with old-fashioned technologies, and often even without electricity. When you want to build your own alpine research station, you should definitely avoid such prototypes. And I really do want to build one. Therefore, there is no other option, but to look for good examples abroad, to study the best practices, to learn about mistakes, and to try avoiding them in the future.

## Objectives of the study tour

In 1930s, famous Czech botanist and plant ecologist Miloš Deyl spent several years on Pop Ivan Maramureş mountain and conducted a detailed research of plants, soil and climate of the region (Deyl, 1940). Thanks to his work, we have a unique base for comparison, which gives us an opportunity to compare “how it was before global climate change” with “how it is today.” But what should be the first step? How should the experiments be carried out? How do alpine research stations function? What do we need to participate in one of those international alpine projects? Too many questions and far less answers.

Therefore, the primary *goal* of the study tour was to acquire as much information as possible on conducting research in alpine tundra to rebuild Deyl alpine research station in Maramureş Mountains.

The objectives of the study tour were as follows:

- i) to study the specifics of nature conservation in subalpine and alpine environments;
- ii) to understand the role of protected area administration in the operation of alpine research stations;
- iii) to find out how researchers from other institutions collaborate with their colleagues in PAs in the field of high-mountain biology;
- iv) to study the benefits and disadvantages of participating in the INTERACT network;
- v) to find out whether the territories of PAs in Ukraine are suitable for monitoring with GLORIA protocol, and if yes, then what should be done.

## Overview of the study tour

After receiving the Scholarship and before the beginning of the study tour itself, a lot of things needed to be done. First of all, I decided to discuss all plans with a person who knows almost everything about the Carpathians and the European mountains in general: Professor Stefan Stojko. He is 98 years old, he knows 15 languages and he is the “father” of almost all protected areas in the Ukrainian Carpathians.

We met with Professor Stojko three times to discuss all the details of the study tour and to predict probable issues. What is also important, Stefan Stojko had visited all the territories that I was planning to visit in early 1950s, even before the national parks in the Krkonoše and the Tatras were established, for the first time, and many more times thereafter.

We decided that I should visit Pop Ivan Maramureş and look for the best possible place for the future alpine station. I was to find the remains of the old buildings and to choose the one to rebuild. The whole Pop Ivan massive is on the territory of Carpathian Biosphere Reserve. Therefore, it is almost impossible to build anything there, but quite possible to rebuild. We know that Miloš Deyl stayed in different shelters there. Today, only two of them remain standing, but in 1930s there were about 10 buildings. So, I was to find them, to compare with the existing alpine research stations during the study tour, and to decide which fits best. This is how the project started.

After visiting Pop Ivan Maramureş, I went to Uzhhorod and then directly to Prague. In Prague I met Dr. Blanka Skočdoplová (M. Deyl’s daughter) and discussed with her the future plans both during my study visits and after going back to Ukraine. After that, I went to Vrchlabí, stayed there overnight and met Dr. Irena Kholova from KRNAP. She gave me tons of valuable information, helped meet other officers of this protected area and later even gave me a lift directly to the alpine tundra of the Giant Mountains. An interesting coincidence was that she had been to Pop Ivan several times, because during her PhD project she was involved in searching permanent monitoring plots established there by Dr. A. Zlatnik, a famous Czech forest ecologist who also worked on Pop Ivan in 1930s.

I stayed in the Krkonoše Mountains for 10 days, trying to evaluate them from different points of view: as a tourist, as a researcher and as a nature conservationist. That stay helped me understand many things. In particular, the most significant differences between Ukrainian and European protected areas. Also, I found out about the dangers of ski resorts — I have never thought about it before.

Then I went to Krakow to meet Prof. Zofia Rackovska and her team. We travelled to Tatra National Park and stayed at M&M Klapa Research Station. Days spent there were very productive — I learned a lot about Tatra Mountains, about conducting research in high-mountain environment, about partnerships between researchers and park administrations. Actually, everything I planned to learn during the study visit.

After Tatra Mountains, I went back to Lviv, and in a day or two I travelled to Pop Ivan. With my colleagues from Deyl Centre for Alpine Studies, we were to stay there for 10 days to find as many as possible experimental plots established by M. Deyl. I thought



that this place would be the very best to shoot the final scene of the clip about the study visits. But it was not...

In autumn, the problem of a huge ski resort, designed for 28,000 tourists, on Svydovets mountain range arose. Those territories are biodiversity islands, and we decided to do everything possible to protect them. I had to recall all the information about the impact of ski resorts, the topic that seemed interesting to me during the study visit. After that, there were numerous visits to Svydovets mountain range, and then another one to the Krkonoše Mountains. I had to see those ski-resorts in winter. That is how one more unplanned study visit occurred.

Finally, after coming back from the Giant Mountains and all the expeditions to Svydovets and Pop Ivan, I was ready to prepare this final report.

## Short description of the protected areas visited

Each of the visited national parks deserves not even a book, but a bookshelf with books about it. Therefore, I will not be able to tell a lot here — I will only mention some of the most important facts and the most remarkable places. However, I will try to help you feel the spirit of each protected area, with a hope that you will visit them one day.

### **Krkonoše National Park (KRNAP, Czech Republic)**

It is located in the northern part of the Czech Republic in the Liberec and Hradec Králové regions. The national park was founded in 1963, and its territory significantly increased by 1986. Today Krkonoše National Park covers more than 370 km<sup>2</sup> of one of the most valuable parts of Central Europe in terms of landscape and biological diversity: the Krkonoše Mountains.

It is the oldest and the second largest national park in the Czech Republic. Together with Karkonosze National Park (KPN) in Poland, they form a cross-border biosphere reserve that covers an area of about 425 km<sup>2</sup>. This biosphere reserve is one of the most visited in the world. Each year, over 10 million people visit it, causing severe anthropogenic pressure on the territory. Later, comparing the visited PAs with the national parks in Ukraine, I will focus on some of the major threats to the Krkonoše Mountains and describe how Czech colleagues have solved these problems. Here, I would like to emphasize that, in my opinion, KRNAP should be the example to emulate for Ukrainian PAs. Its experience **MUST** be studied by Ukrainian nature conservationists and taken into account when developing management plans and planning research projects.

The Krkonoše Mountains, also known as the Giant Mountains, are in fact rather low. The highest peak, Sněžka (Fig. 1), is only 1,603 m a.s.l., but what is probably the



*Fig. 1. Sněžka – the highest peak of the Krkonoše Mountains surrounded by krummholz*

most important characteristic of the territory, it has well-developed subalpine and alpine tundra ecosystems, which are very rare at such altitudes in the temperate zone. They were formed under the influence of strong and cold winds from the North Sea (Fig.2), which caused a very low alpine tree line, from 1,200 to 1,350 m a.s.l. In comparison, in the Carpathians, which are the nearest mountain system, the tree line is usually higher than 1,500 m a.s.l. and in the Eastern Alps, about 1,750 m a.s.l.

Such unique conditions, combined with high plateaus in the lower alpine and subalpine zones, led to the formation of alpine or arctic-alpine tundra with krummholz and peatlands. These ecosystems contain lots of relict, rare and endemic species, as well as habitats included in NATURA2000.



Fig. 2. Origin of harsh weather conditions in the Krkonoše (credit to KRNAP)

A very important component of alpine environments are mosses and lichens. In the Krkonoše Mountains, there are 150 species of mosses, 350 of liverworts and more than 250 species of lichens (Flousek et al., 2007). Conservation of such environments requires strict rules and regulations. It is not an easy task to follow all of them under the pressure from millions of tourists. In this context, some of the issues, such as ecosystem fragmentation and soil erosion, seem unavoidable, but most of them really can be resolved, and KRNAP can boast of many success stories in this area.

Also, the administration of this protected area is focused not only on nature conservation (both *in situ* and *ex situ*), but also on monitoring and research projects. This creates a pleasant and inspiring environment, helps with logistics, etc. What else do you need for a successful research project?

I think that this PA should be a must-see national park for every nature conservationist in Europe. Of course, not only for specialists! To be honest, I fell in love with those mountains and have already recommended the Krkonoše to almost all of my friends and relatives. However, there is one very important thing every visitor of those mountains should keep in mind. It is really cold and wet there! When I was leaving Ukraine in August 2017, the temperature was about 32°C, while in the Krkonoše it was 12°C! So, don't make my mistake and don't underestimate the Giant Mountains!

### **Karkonosze National Park (KNP, Poland)**

It is located in the southwestern part of Poland, along the border with the Czech Republic. This national park was founded in 1959, four years earlier than KRNAP, and covers the area of over 59 km<sup>2</sup>. Natural conditions in the Polish part of the Krkonoše are not exactly the same, but very similar to those in the Czech part of the mountains. The state border crosses the highest part of the Krkonoše, including the Sněžka peak.



*Fig. 3. Sněžka in late July: hundreds of tourists even in rainy weather*

It was reported that over 1,5 million of people visit the park annually. Taking into account a rather small size of the protected area, this factor, including both summer and winter tourism, significantly affects various ecosystems of the territory, especially above the alpine tree line (Jahn, 1985). Luckily, only the highest peak is very popular with tourists (Fig.3), while other mountains with high alpine zones are still suitable for numerous environmental research projects. However, even on the Sněžka peak, lots of geobotanical, entomological, soil and other studies are carried out, besides meteorological monitoring.

Although the alpine tundra is the most remarkable ecosystem in the Giant Mountains, forests are the most widespread. They cover almost 74% of the KNP territory, which is less than in KRNAP (83%). For

those familiar with the ecological disaster that occurred in 1970s in the Krkonoše forests, their modern state seems unbelievably good. Earlier, significant air pollution led to mass dying off of the coniferous trees in the region. (Weber et al., 2017). These processes were especially dangerous in the artificial (secondary) spruce stands. Since 1990s, the intensive felling in those forests begun simultaneously in the Czech and Polish parts of the Giant Mountains.

It aimed at developing mixed uneven aged forests, the ecosystems that are much more sustainable and capable of self-regeneration. Some of the first results of such management are already visible: the forest structure has significantly improved, where intensive felling of damaged stands was applied.

Access to the Krkonoše Mountains seemed to me easier from the Polish side, but three major tourist centers (Pec pod Snezkou, Špindlerův Mlýn and Harrachov) are located in the Czech Republic.

### **Tatra National Park (TNP, Poland)**

There is a park of the same name in Slovakia, and often this is rather confusing. In 1992, simultaneously with the Krkonoše and Karkonosze national parks, these protected areas were also united in the transboundary biosphere reserve by UNESCO, under its Man and the Biosphere Program. In this report, all mentions of Tatra National Park refer only to the Polish protected area.

This national park is located in the Tatra Mountains, the highest range of the Carpathians. The environment does not look like other parts of the Carpathian Mountains, except for the Maramureş Mountains, and is much more similar to the Alps. The highest altitude of the park and at the same time the highest point of Poland is the Rysy peak. This mountain has three summits. The north-western summit (2,499 m

a.s.l.) is located in Poland, while the other two, the middle (2,503 m) and the south-eastern (2,473 m) ones, are in Slovakia.

TNP partly covers High Tatras and Western Tatras. Even though the highest peaks of these ranges are located in Slovakia, the high-alpine environment is also well represented on the Polish side. Sharp-edged peaks, caves, hollows, plateaus, mountain lakes, including the most famous one, Morskie Oko (literally "Sea Eye"), provide habitats for many species, including the rare and endemic ones. However, they also attract numerous tourists. Over 2,5 million people visit this territory annually. The infrastructure, though well-developed, does not have enough capacity to support such huge number of visitors. One of the most visited places here is the Giewont Massif (Fig. 4). These mountains are clearly visible from Zakopane and attract lots of tourists. During the high season it takes many hours to reach the top of the mountain because of the crowds of tourists.



*Fig. 4. Giewont Massif, one of the most visited and easily accessible mountain groups near Zakopane. You need to wait for hours in queue to reach the peak*



*Fig.5. Photo of John Paul II in the hole of PTTK shelter at Glade Chochołowska*

There are many shelters for tourists in TNP. Most of them seem much larger than those in the Krkonoše and provide all the necessary infrastructure for visitors. Many places and buildings in the region are named after Pope Saint John Paul II. He spent a lot of time in the Tatras as a priest and as a bishop. Later, already as the Pope, he came here regularly. His phrase *“w górach chodź zawsze tak aby nie gubić znaków”* (*“in the mountains move without leaving any traces”*) became the motto for environmental activists and hikers, and the Pope himself was awarded the rank of an honorable Tatra guide. The idea of having own patron saint of the

region and the Tatra Mountains in general seems a very good one to me. Especially, when the patron is such an adored person as John Paul II. That means less rubbish in forests and grasslands, fewer poachers, and less disturbance of natural ecosystems in general. Because John Paul II is watching you!

This ensures a different level of protection, because park rangers, even with the best equipment, cannot see everything. Such practice, from my point of view, should be widely used in religious countries. It would definitely be effective in Ukraine, and especially in the Carpathians.

Tatra National Park supports research projects on its territory. Moreover, in 2015 they published the Atlas of the Tatra Mountains, the best and the most detailed collection of maps of the mountains I have ever seen. It reflects various aspects of the territory, from geology to geomorphology and from glaciology to biogeography. Also, and that is very important, this Atlas describes entire Tatra ranges, and not only Polish or only Slovak parts ([Atlal Tatr, 2015](#)).

*"Many thanks, too, do we owe to the sheep, both for appeasing the gods, and for giving us the use of its fleece."*

Gaius Plinius Secundus, *Naturalis Historia*, 77-79 AD

## Part II. Analysis

### Past and modern human impacts on subalpine and alpine ecosystems

Most European mountains were inhabited by first humans in Early Stone Age. For example, in Korolevo (Transcarpathia, Ukraine), the first Early and Middle Paleolithic site was established more than 800,000 years ago (Koulakovska et al., 2010). However, those early humans did not have any significant impact on the local ecosystems. Most of them were hunters, they moved usually along valleys, which were the best hunting territories, and did not come high up into the mountains.

After the Neolithic Revolution, human settlements became much larger. They were still located mostly in the valleys, and not just for the hunting purpose, but because of the fertile soils that were widespread there. This period in the early human history led to the first significant changes in the structure and coverage of the ecosystems. Deforestation and land use changes entailed significant environmental changes in the valleys, but did not affect the ecosystems of the high mountains.

First significant impacts on subalpine and alpine environments are closely related to sheep domestication. It has been reported that the first evidence of sheep farming in Europe goes back to 6,000 years BC. Several such sites have been found in the Southern Alps. Later, about 4,000–3,000 years BC, there was already a large number of sites in the European mountains with the signs of pastoral farming (Ducos, 1977; Garde et al., 2014). During that time, sheep began to play an important role globally. They can be seen even on one of the most important Sumerian artifacts, the Standard of Ur, which was created more than 4,600 years ago (Fig. 6). On its "Peace" side, sheep are shown as an important part of the daily routine of the Sumerians.



*Fig. 6. Peace side of the Standard of Ur (2 600 BC), credit to the British Museum*

Elsewhere, domestication of sheep was equally important. After a while, valleys alone could no longer provide enough life space for humans and livestock, especially in the context of drastically increasing population. Some “farmers” were forced to look for other pastures, and this was probably the beginning of the history of anthropogenic changes in the subalpine and alpine environments. However, those changes were slow and often reversible: there was still enough space for everyone. Only in the Middle Ages, when sheep population in Europe significantly increased, shepherds started clear-cutting krummholz and high-mountain forests to increase pasture areas.

Since that time, shepherds’ daily routine has not changed significantly, especially in such remote areas as the Carpathians. In many places, they live and work as they did 500 years ago — staying for half a year in the subalpine and alpine grasslands and supplying local villages with milk and cheese. They hunt, cut trees for their needs, and intensively gather mushrooms and berries. There are far less sheep and shepherds in the mountains these days, and their impact on the subalpine and alpine environment decreased greatly since the second half of the XX century. However, as a result of their activities, alpine tree line also significantly lowered in most of the mountains for about 120–150 m and more.

Besides sheep and shepherds, another danger in the high-mountain environment was the high price for the essential oil of dwarf mountain pine (*Pinus mugo*). It is still high today, 100 ml of this oil selling for about 50 EUR. Today, however, a number of strict limitations are in place, which did not exist 100 years ago. Clear-cutting of krummholz for this purpose was almost uncontrolled and caused huge and often irreversible damage to fragile subalpine ecosystems. Probably the best example of the consequences of such activities can be found between the Gomul and Dancerz Mountains (Chornohora mountain range). Previously, they were covered by dwarf mountain pine. In 1920–1930s, krummholz was clear-cut for the needs of the French factories Olearta and Hoverla that were operating there. In 1925–1927, only strips of krummholz were left on the Gomul (Fig. 7).

In 1939, after a heavy rain, the factory building was destroyed, and all its staff was killed by a powerful mudflow. No adjacent mountains with krummholz were affected by that rain, and the mudflow occurred only on the clear-cut territories. Twelve years earlier, another mudflow destroyed a similar factory on the Szpyci Mountain. Harvesting krummholz became an important factor that significantly affected the subalpine and alpine ecosystems.

Another species that was clear-cut at that time in high-mountain environments was green alder (*Alnus viridis*). As in the case of mountain dwarf pine, its biomass was used in pharmacy, as well as in paint and varnish industry.





*Fig. 7. Gomul Mountain in 1925–27 during the harvest of dwarf mountain pine*

Moreover, often the harvested territories that were previously covered with krummholz, were burnt, either on purpose, to convert the land into pastures, or accidentally. Also, in some places local people, who professionally gathered berries (mostly blueberry and cowberry), also periodically burn those territories because they believed that after fire berries grow better and bigger. Unfortunately, such activities can cause huge surface fires (Fig. 7) that damage not only alpine and subalpine zones, but also the coniferous forests below the alpine tree line. This practice is still popular in some places of Ukraine and Romania (in the Carpathians) and was popular decades ago in other European mountains. Together with all of the above factors, it has significantly affected and still affects high-mountain environments (Fig. 8), and even on the territory of protected areas, the elevation of an alpine tree line may be determined by the fires that happened many years ago.



*Fig 8. Subalpine grasslands on Mount Pikui in 2013 after a surface fire; unique beech krummholz was partly damaged*

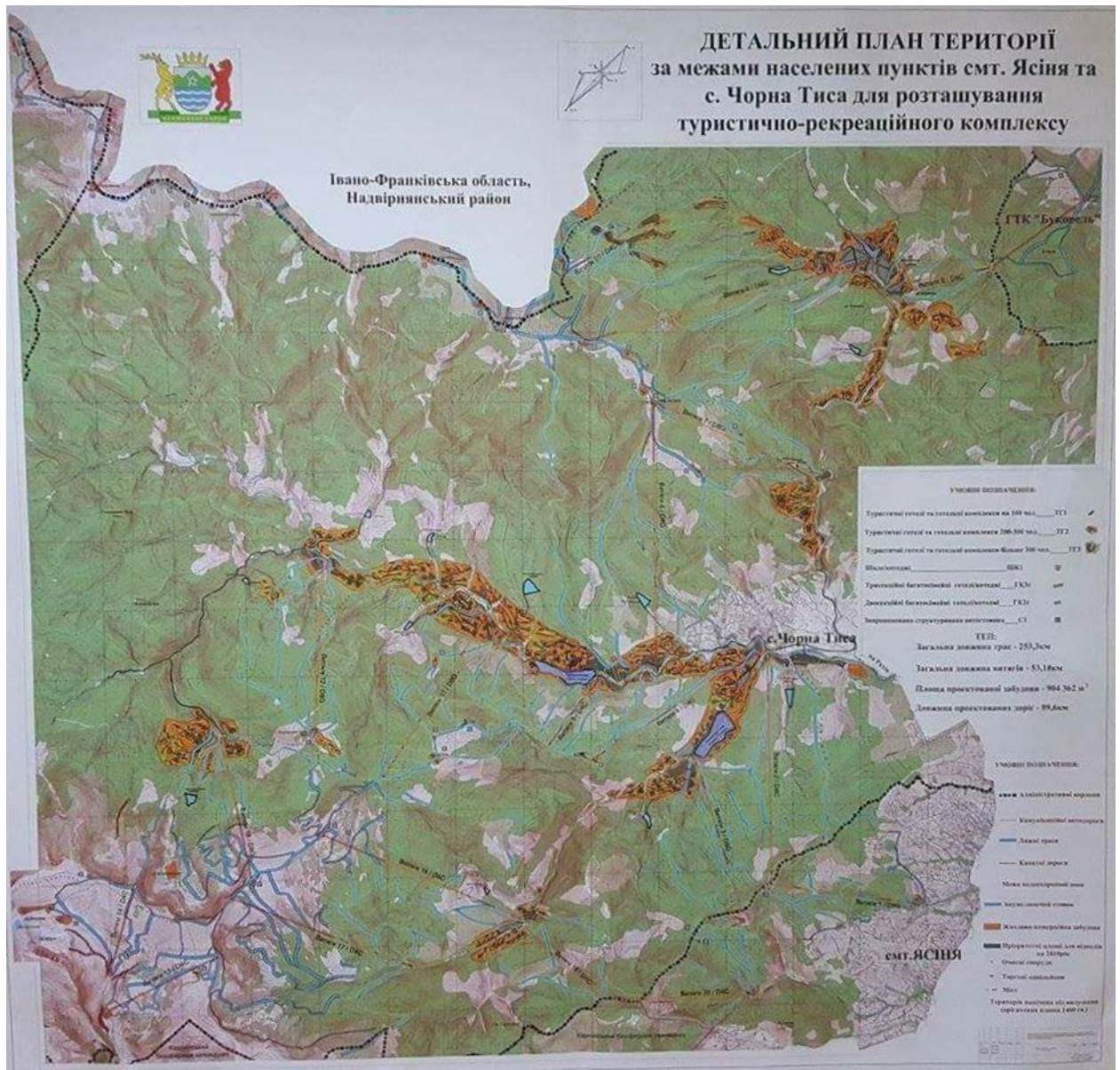
Today, the most important factor is tourism. It has different forms including hiking, cycling, skiing, off-roading, etc. All these activities entail various and sometimes unpredictable results. Earlier, it was believed that tourism helps protect ecosystems from such obvious dangers as logging or poaching. It definitely does, but has other, not so obvious, but also very negative impacts.

Uncontrolled “wild” tourism is probably the worst variety that has led to contamination of the environment with huge quantities of wastes, uncontrolled wood harvesting, etc. Recently, it became clear that even well-planned activities, such as skiing, may be accompanied by many hidden dangers and risks, especially in the context of the global climate change. First of all, shelters and hotels in the mountains often pollute the environment with waste waters. However, other, not so obvious risks are much more significant. For example, snow cannons used on ski resorts to extend their ski seasons require a lot of water. Usually it is taken from surface waters, depleting and significantly affecting freshwater ecosystems. This environmental problem is one of the most important in the Giant Mountains: surrounding ecosystems suffer from the lack of water drained by ski resorts. This issue is not a new one. It was described in the early 1990s in the USA, but in the early 2000s, when Bukovel ski resort was built in Ukraine, no hydrological studies were carried out. The requests of scientists and environmental activists that emphasized the necessity of such studies based on the situation in the Rocky Mountains were called ridiculous.

Now, in 2017, when another ski resort is going to be built in Ukraine, this time on the Svydovets range (Fig 9), with over 60 hotels, 120 restaurants, 33 ski-lifts and 230 km of runs, the situation is almost the same. All of this is to be funded by unknown investors, whose identity Transcarpathia Governor Henady Moskal refuses to reveal. Several shopping malls, medical and fitness centers, banks, parking areas and even a landing strip are included in the plan. The future resort will be able to host up to 28,000 tourists daily.

Lewis Milford, an environmental lawyer, wrote in 1994: “When it comes to environmental damage, we tend to think of the traditional bad guys — mining, logging, ranching. But snow making takes a lot of water out of rivers and streams, in some cases depleting them to dangerously low levels” ([Milford, 1994](#)).

Today, many local community representatives, environmental activists and scientists united into the Free Svydovets group coordinated by Iris Del Sol. My experience gained during the study visit to the Krkonoše National Park on the impact of ski resorts on the environment was valuable for planning research and conservation actions. I joined the team, and the director of my institution Prof. Natalia Zaimenko also supported us. We have already planned research activities to highlight the importance of the Svydovets mountain range, where more than 100 rare and threatened species of plants and animals were found ([Kanarsky et al., 2018](#)). Also, several national organizations, as well as international ones, such as European Civic Forum and WWF, support this campaign. However, this is still an uneven contest, and in this context we will ask EUROPARC Federation for future support. We really need success stories in similar circumstances, as well as advice from this respected international organization on saving this unique place in general. For the time being, we have won the case against the investors, but it is only a temporary success, and the fight will continue.



*Fig. 9. This low-quality photo is the only available image available today of the planned 1,400 ha ski resort on the Svydovets mountain range. The officials refused to provide any information about it to avoid research that may reveal threatened species and habitats*

This case shows how hidden or at least non-obvious dangers may affect mountain ecosystems. They are many, but here I would like to focus on just one more, which is really a matter of high importance in my country. This danger comes from professional collectors turned poachers. The term “poachery” was originally used to describe illegal hunting. Since 1980s, it also means illegal harvesting of wild plants, capturing animals (including insects), etc. People have a variety of sometimes very strange hobbies, and there are many more collectors of wild species than people may think. Many of them are ready to pay huge amounts of money to have a complete genus, for example. In early 2000s, together with environmental inspectors, we accidentally captured one such collector, a “black entomologist” (like in “black archeologists”). He was collecting rare species and selling them abroad. We found that man only by chance. It is almost impossible to capture such professionals, either in Ukraine or in the developed

countries. Their qualification is too high for park rangers or environmental activists, but professional investigators are not interested in such criminals.

Another type of poachers, similar to those mentioned above but not exactly the same, are people collecting plants or hunting animals for medical purposes, mostly to “cure” impotence, cancer, or AIDS. Such medicines are much more typical for Asian countries, where you can find “Tiger Bone powder” or “Rhino Horn Powder” (the most expensive “drug”). However, some of these barbarian medicines could also be found in Europe. Here, it is still widely believed that drinking bear bile is the best way to cure erectile dysfunction, and hundreds of bears are killed each year for this purpose.

In 1972, Gerald Durrell published his famous book, *Catch Me a Colobus*. I would like to quote here a short extract about Durrell’s expedition to South America, where he looked for one of the most vulnerable species in Mexico, volcanic rabbit or teporingo:

*‘Where’, I inquired, ‘are they?’*

*‘Oh,’ he said, ‘I ate them.’*

*This is an animal which, on paper at least, is one of the most strictly protected creatures in Mexico, and this was a forest guard, inside a national park, speaking to me. This sort of thing is not just common to Mexico, it is common all over the world where animals receive what I call ‘paper protection’ but are not protected in fact.*

Finally, the most dangerous poachers are the people who should be protecting wild animals, but kill them instead. Recently (on November 3, 2017), a car of park rangers from the Carpathian biosphere reserve (Ukraine) was stopped by forest service officers. When the officers tried to inspect the car, park rangers Mykola Shemota, Vasyl Shemota and Vasyl Sukhan refused and tried to escape. They were throwing firewood to the pursuers to stop them, but finally, when police arrived, the remains of a deer used as a bait and a bear were found (Fig. 10).

In a week or so, more shocking pictures became available online (Fig. 11). Again poachers, again threatened species, but this time, a forest service officer Vasyl Kabal (who captured the poachers on November 3, 2017) posing with a shot lynx and a black grouse (species included into the Red Book of Ukraine).

Unfortunately, these two incidents are not exceptions in Ukraine. Many wild animals are shot dead in mountain regions, often by forest guards and park rangers. There is even a joke popular among those people that goes: “Polish deer prefer Ukrainian food, because they cross the border and never come back” and that “Ukrainian lead tastes better than Polish grass”. I believe this applies to the wild animals from Romania, too.

Nature conservation in such remote mountain regions, with poor infrastructure and ‘paper protection’ of the habitats and species, is a matter of high importance, and all issues in this context should be addressed on both national and international levels.



*Fig. 10. Remains of a deer and a brown bear probably killed by park rangers (brown bear is an endangered species in Ukraine)*

1,400 ha ski-resort on the Svydovets mountain range. Officials refused to provide any information about it to avoid research that could have revealed endangered species and habitats



*Fig.11. Forest guard Vasyl Kabal who after shooting a Eurasian lynx and a black grouse (rare and endangered species respectively, Red Book of Ukraine)*

## Conserving alpine environments in the European Union and in Ukraine

Each country has its own traditions in the area of nature conservation. However, most Western European countries usually have similar or comparable approaches to it. On the contrary, in Eastern Europe, protected areas have been managed under a strong influence of the Soviet tradition of nature conservation based in the ideas of V. Dokuchaev and G. Kozhevnikov. Here we will discuss the historical background of these differences and then focus on the modern situation, issues, and uncertainties.

### Historical background: Strict nature reserves in Ukraine

In 1890s, Russian soil scientist V. Dokuchaev suggested the theory of strict nature conservation known as “zapovednost” in Russian. Later, his ideas were developed by I. Borodin and G. Kozhevnikov. In early 1920s, the first strict nature reserves, or “zapovedniks” were established (Shtilmark, 2003). Those protected areas meet several important criteria:

- i) they represent untouched or primeval nature ecosystems;
- ii) their territory is closed to all visitors, including locals, excluding scientists with special permissions and rangers;
- iii) the protected area should be large enough to be self-sufficient with all trophic layers and developments stages.

Such approach sounds great, and the network of “zapovedniks” is still functioning in the countries of the former Soviet Union and is an important reference for other managed ecosystems. For example, scientists of Swiss Federal Research Institute WSL have studied primeval beech forests in Ukraine (Carpathian Biosphere Reserve) for over a decade to improve the state of managed beech forests in Switzerland. Such examples are many. However, “zapovedniks” became a problem after the collapse of the Soviet Union.

Originally developed for large and almost uninhabited territories of the Russian Empire and later the Soviet Union, “zapovedniks” were later expanded to all biomes, including mountain areas. However, it is well known that territory is limited in such places. Most of fertile soil is located in valleys, and local populations significantly depend on forests and grasslands. Closing access to huge territories for local communities (where they traditionally gathered mushrooms and berries, hunted, etc.) caused conflicts between the locals and administrations of protected areas.

In 1990s, when an average monthly salary in the Ukrainian Carpathians was less than \$15, many people had no choice but to resort to illegal hunting and logging to survive. Later, in many places the *status quo* was reached: administration of protected areas and forest enterprises pretended that they did not notice poachers, whereas poachers and other criminals behaved quietly and often to paid the administration for the connivance.

Today the situation has changed, but not dramatically. For example, monthly salary of a park ranger in today’s Ukraine is about \$120, whereas food is only 15-20% cheaper

than in the EU. Naturally, in such circumstances, they need to look for additional sources of income, and such sources are often illegal.

In most of the PAs, rangers have no vehicles, and if they do, there is usually no fuel. In winter, when illegal hunters are very active, it is almost impossible for park rangers to catch them, since they don't even have snowshoes. Certainly, there are exceptions. Some PAs are really effective, and managed to ensure both collaboration from local communities and effective nature protection. However, such examples are very rare.

To my mind, unpleasant experience with strict nature reserves is the reason for the bad attitude of local residents to the PAs in general. For example, the Carpathian Nature Reserve (IUCN Ia) was founded in 1968, and in 1992 it was transformed into the Carpathian Biosphere Reserve (IUCN II). However, many locals did not understand the difference and were concerned that they would not be able to gather mushrooms, berries, etc. They encouraged another people to protest against the PA, without any logical reasons. Many of them still repeat the fairy tale about mushrooms and berries, more than 25 years later.

This complex and complicated system of PA management inherited by Ukraine from the Soviet Union is still in place. Below are some characteristics typical of most Ukrainian PAs:

- i) overstaffing (up to several hundred employees);
- ii) very low salaries (\$120-300 per month);
- iii) redundant administrative staff: too many people in unnecessary job positions, like 4-5 accountants, 3-5 HR officers, etc.;
- iv) scientists employed in Ukrainian PAs strictly follow the guideline of the standardized monitoring program known as the Chronicle of Nature ("Літопис Природи"). Therefore, they pay much less attention to the research projects carried out by other institutions in a national park or nature reserve.

These aspects form a historical background affecting all protected areas in Ukraine. Now, I will focus on nature conservation in alpine environments.

## **Nature conservation in alpine environments in Ukraine, Poland and Czech Republic**

First of all, I would like to say that these countries have a lot in common: mountains cover only a small percent of their territory. Only 3% of the territory in Poland is higher than 500 m a.s.l., and 32% in the Czech Republic, mainly high plateaus (only about 1% of the territory is higher than 1,000 m a.s.l.). In Ukraine, mountains cover about 5% of the territory. Therefore, in all three countries, mountain areas are very attractive to tourists. Neighboring countries, such as Slovakia and Austria, are mountain countries. In Slovakia, uplands and mountains cover almost 60% of the territory, and in Austria, almost 70%. In this way, impact of tourists in these circumstances differs significantly.

Protected areas in the Carpathians and the Krkonoše are under very strong anthropogenic pressure, both from local populations and tourists. Here, I would like to

summarize the most important characteristics of such PAs in the Czech Republic and Poland and compare them to Ukrainian protected areas (Table). Most differences are related to management. Therefore, in Ukrainian national parks, it might be significantly improved by applying the best practices learned from European protected areas.

Table

**Important differences between PAs in Ukraine, Poland and Czech Republic**

	<b>Ukraine</b>	<b>Czech Republic</b>	<b>Poland</b>
<b>visitor access to PAs</b>	paid admission <sup>1</sup>	free	paid admission
<b>average staff salary</b>	below living wage	competitive	competitive
<b>research</b>	conducting <sup>2</sup>	coordinating	coordinating
<b>monitoring</b>	conducting	conducting	conducting
<b>nature conservation</b>	national level	national level + EU <sup>3</sup>	national level + EU
<b>environmental fines</b>	low	high	high
<b>leaving pathways</b>	allowed	forbidden	forbidden
<b>making fire</b>	allowed	forbidden	forbidden
<b>camping</b>	everywhere	only campsites	only campsites
<b>tourist shelters</b>	free	for a fee	for a fee
<b>off-roading</b>	formally forbidden <sup>4</sup>	forbidden	forbidden
<b>role of PAs in environmental education</b>	low	high	average
<b>role of PAs in <i>ex situ</i> and <i>in situ</i></b>	low	high	average
<b>influence on adjacent territories</b>	low	high	high

<sup>1</sup> in Ukrainian PAs, visitors should have tickets. Unfortunately, they are not available online, as in Poland, and there are no fines for access without tickets. Therefore, most tourists don't buy them

<sup>2</sup> Ukrainian protected areas usually have their own research departments. Scientists from these departments are responsible for conducting their own research, but not for coordinating research on the PA territory in general



<sup>3</sup> habitats and species in Poland and the Czech Republic are protected by both national and international laws. For example, there might be NATURA2000 sites on PA territory, providing additional protection

<sup>4</sup> in Ukraine, off-roading on PA territory is only formally forbidden. The son of our former president Yanukovich used to organize and participate in numerous off-road competitions in PAs, including strict nature reserves

Management plan is another important difference between Ukrainian and European PAs. I have not mentioned this before, because it requires additional explanations. In most Ukrainian PAs, there are no management plans. Instead, they still use "Plans for Territory Development," the soviet analogue of management plans, oriented towards the state-run economy. Hence, many issues, such as conflicts with local communities (shepherds, hunters, etc.), are not reflected in this document: obviously, there were no such conflicts in the Soviet Union.

In my opinion, Soviet practices are the most important reason for today's poor state of protected areas in Ukraine and other post-Soviet countries. Many good examples to support this idea can be found in Transcarpathia, which is now Zakarpatska oblast of Ukraine and before, of USSR. Before the Second World War, this territory belonged to Czechoslovakia. The territory of my primary interest, the Maramureş Mountains, was a well-developed resort back then. Today, there is a small shelter (Fig. 12) with 1 room and 4 beds. However, a century ago, this was a big and comfortable tourist shelter with 12 rooms, 70 beds, a restaurant, ski rentals etc. (Fig. 13). It was much similar to shelters still existing in the Czech Republic and Poland (Fig. 14). The shelter on Pop Ivan (Fig. 13) was burnt in early 1960s. This situation is typical for the Ukrainian Carpathians, where such examples abound.



*Fig 12. Small shelter on Pop Ivan Maramureş, 2015, credit to <http://vorobus.com>*

Poor infrastructure means wild tourism, the problem that has almost disappeared in Europe, but is still important in Ukraine. Tourists leave trash, they cut down krummholz to make fire, sometimes they even burn doors, tables etc., as it happened with the shelter shown on Fig. 13. These examples were needed to explain the lack of infrastructure in the Ukrainian Carpathians (especially in remote places), compared to the European countries. Due to this, it is almost impossible not only to protect species

and habitats, but even to protect buildings. That is why I think that nature conservation in subalpine and alpine zones of the Ukrainian Carpathians unfortunately is only formal.



**Turisté!  
Lyžaři!**

Vystupte na velkolepý, bájemí opředení

**Pop Ivan**

1940 m,  
zlatý hřeb tur na račovsku. Státní rezervace alpské květeny. Nedostižný vysokohorský lyžařský terén.

Nová  
**Horská chata „Pop Ivan“**  
(Vaškova)  
1560 m

**Restaurace, pokoje, noclehárny, kolíba 70 noclehů.**  
Nejkratší příchod z Trebušan. — Pense Kč 32.—.

Fig.13. Tourist shelter on Pop Ivan in 1930s, burnt in 1960s



Fig.14. Tourist shelter Chata pod Studničnou, Czech Republic, 2015,

Credit to <http://www.podstudnicnou.cz>

Subalpine and alpine ecosystems are fragile. They are located in remote territories having no permanent residents. Moreover, most of such territories were previously used by local communities as pastures or for hunting purposes; and locals often still consider them to be their property and are against the limitations imposed by the PA status.

I have seen a park ranger in the alpine zone of the Ukrainian Carpathians only twice. Meanwhile, during my short-term visits to the Krkonoše Mountains and the Tatras, I saw 8 park rangers. That is why broken windows theory works in the Ukrainian Carpathians so well: nobody cares!

I am sure that without the permanent control of these territories by park rangers, police, environmental inspectors, etc., it would be impossible to reach the declared level of nature conservation in Ukraine and to follow EU standards. Moreover, when the park administration is not in charge, and it usually is not in subalpine and alpine zones, other stakeholders become more and more important. In the Maramureş Mountains, for example, these are shepherds and locals gathering berries (mostly bilberry).

Such situation overcomplicates the task of participating in various international research and nature conservation programs, in particular, such as GLORIA and INTERACT.

## **INTERACT and GLORIA in Ukraine: perspectives and difficulties**

Based on the risks and limitations discussed above, here I would like to focus on the perspectives of participation of Ukrainian researchers and protected areas in international research initiatives. These are many, and I chose only two that may be the most important for Ukrainian researchers: INTERACT and GLORIA.

INTERACT (International Network for Terrestrial Research and Monitoring in the Arctic) is focused on conducting research in Arctic and high alpine environments. It is the network of 83 field research station, and participation in this network gives access to all of these stations. They are located not only in the Arctic, but also in subalpine and alpine zones of the mountains. I visited two of them, in the Czech Republic (Krkonoše Mountains National Park) and in Poland (M&M Kłapa Research Station in Tatra National Park) during the study visits funded by Alfred Toepfer Natural Heritage Scholarship 2016.

I saw that research stations largely depend on national park administrations to get access to rent, water, electricity and, most importantly, to the protected territory that is the object of their research.

Before the study visit, I did not understand why Ukrainian research stations do not participate in INTERACT. We have at least 4 research station located above the alpine tree line. Some of them are rather old; for example, the research station on the Pozhyzhavska Mountain (Chornohora mountain range) was built in 1890s. However, today no Ukrainian station participates in INTERACT. During the study visit, I understood the most probable reason for this phenomenon. It may be called “bad science.”

Today's Ukraine is experiencing problems similar to those Poland and the Czech Republic faced 20-25 years ago. Science is no exception. It is focused on internal processes in general. Most of the results of Ukrainian scientists are published in local scientific journals. Usually, they are not peer-reviewed, with low citation indexes. However, in Ukraine such papers and journals are still very popular.

High quality equipment, internationally recognized study sites and researchers are needed to perform top-level research projects and to publish their results in the best scientific journals. But what for? In Ukraine, only enthusiasts publish high-quality papers in top journals. Most scientists are not motivated. They consider it satisfactory to write a paper in Ukrainian language for a local journal. After all, neither citation index nor the quality of research papers affect researcher's salary. And if there is no need, in general, in such publications, then what's good of having expensive equipment and field research stations?

Participation in international research projects and networks is mutually beneficial only to active and ambitious researchers, and as long as they are in the minority, there will be no need in INTERACT or GLORIA in Ukraine.

For the moment, we have created a team of young and ambitious researchers, we have received the approval from the Carpathian Biosphere Reserve, and this year we will apply to INTERACT with a request to give us an observer-station status. This will only

be possible thanks to the experience gained during the study visit funded by the Alfred Toepfer Natural Heritage Scholarship.

As for the Global Observation Research Initiative in Alpine Environments (GLORIA) project... Before the study visits, I considered establishing monitoring plots according to GLORIA protocol as the first step, and the alpine research station as the second one. Now I understand that these two processes are independent of each other. Moreover, it seems to me that meeting all the criteria described in GLORIA protocols would be impossible in today's Ukraine. The matter is that in order to perform monitoring according to the criteria and to study only the impacts of the global climate change, it is necessary to exclude all other factors, especially grazing!

It is difficult to believe, but in the Czech Republic on a relatively small territory researchers and nature conservationists managed to find 3 to 4 peaks for permanent monitoring according to GLORIA requirements, whereas in Ukraine, with much larger subalpine and alpine territories, we cannot do it. The problem is, as I have mentioned above, that subalpine and alpine zones, even included in the protected areas, are not actually under their control. Therefore, extensive grazing occurs almost everywhere in the subalpine and alpine zones of the Ukrainian Carpathians, with the exception of the Gorgany Mountain Range, where the alpine tree line is of the orographic origin. There are far less sheep now than in the early 20<sup>th</sup> century. For example, in 1930s, M. Deyl reported over 10,000 sheep in the Maramureş Mountains. Today, they are less than 500, but they are still there! Hence, it is a matter of high importance to choose prospective territories above the alpine tree line for GLORIA monitoring. Then, it is necessary to ensure the real, rather than nominal, protection of those territories. Only after that will it be possible to establish permanent monitoring plots.

I believe that we will not be able to start monitoring according to GLORIA requirements before 2020, but thereafter we will definitely do so. This time is required for negotiations with PAs, shepherds, and other stakeholders.

Finally, a few words must be said about meteorological observations. Obviously, this sort of data is very important for all kinds of research related to the global climate change.

Both visited PAs have several meteorological stations forming a gradient infrastructure, from the valley to the mountain top. This is certainly the best option. Unfortunately, we do not have such opportunities, and it would be great if at least one meteorological (weather) station could be installed on the Pop Ivan Maramureş.

We decided to look for an automatic weather station (AWS) like the one in the Krkonoše Mountains to obtain reliable and comparable results (Fig. 15). Unfortunately, such equipment cannot be left unguarded, because it might be damaged or even stolen. Therefore, the first step should be building the station itself, then, placing data loggers and only after that installing professional weather station.



*Fig. 15. Automatic weather station (AWS) in the Krkonoše Mountains, 2017*

With respect to the station, we have discussed various form factors and types, from permanent construction to mobile. The result largely depends on the position of the Carpathian Biosphere Reserve: whether they will allow a permanent building on the Pop Ivan. If not, the very best choice would probably be mobile constructions, preferably like on Fig. 16, but possibly also the geodesic domes (Fig. 17), which proved to be efficient during the Euromaidan (winter of 2013-2014).



*Fig 16. Mobile field research station in Carpathian National Park (Ukraine),  
funded by Frankfurt Zoological Society*

However, the type of building is not the most important feature. What really matters is the team. At this moment there are 5 young researchers that are interested in conducting research in the subalpine and alpine zone of the Ukrainian Carpathians.



*Fig. 17. Geodesic domes that we used in 2013-2014 during Euromaidan  
in Kyiv as the press-center and the base for live streamers*

Needless to say that the territory of our primary interest, the Pop Ivan Maramureș, may become the first participant of the international research networks, but definitely not the only one. Now, in the context of the Svydovets campaign, we decided to set up

permanent monitoring plots in the alpine zone of that mountain range, too. In autumn 2017, our team (Deyl Centre for Alpine Studies) joined and supported the Free Svydovets group. At first, it was just a scientific substantiation for the public campaign against a huge ski-resort construction project.



*Fig. 18. Taking snow samples on Svydovets mountain range, 2017*

However, now we have included this territory into our research interests, which is important for the future field station on the Pop Ivan also. The matter is that this campaign reveals the importance of subalpine and alpine environments not only on the Svydovets, but also in general. Hopefully, this huge campaign with thousands of letters from all over the world, including members of parliaments of several European countries, will convince our officials to conserve high-mountain ecosystems. Then, it will be much easier both to install research stations and GLORIA monitoring plots in the Ukrainian Carpathians.



### **Part III. Conclusions & Recommendations**

When planning the study visits, I wanted first of all to see the benefits of participating in international research networks, to study the mechanisms and methods of conducting research in the alpine environments, and to understand how research stations and protected areas collaborate with each other.

However, in addition to achieving the planned goals, I acquired experience in other fields, which surprisingly became very relevant. Before the study visit, I had no idea about the negative impacts of ski resorts. Visiting national parks, where problems typical of Ukrainian parks, such as trash, poachers, and wild tourism, were solved long ago, I was astonished that they have huge problems with water, even on so perfectly well managed territories. Therefore, I decided to study the topic, talked to the experts and local people, and all this was really timely. I used this experience to support the public campaign against building the new 1,400 ha ski-resort on the Svydovets mountain range in Ukraine. Both our project's team (Deyl Centre for Alpine Studies) and my employer, M.M. Hryshko National Botanical Garden, have joined the Free Svydovets group. Together with my director, Prof. N. Zaimenko, I have prepared the letter to the Minister of Ecology and Natural Resources of Ukraine (Annex A) about the risks of a ski resort on the Svydovets. That letter was considered to be important evidence and helped us win the case against investors and to stop temporary all activities in this field. However, this was only the first round. Further support from international organizations and, in particular, from EUROPARC Federation is vitally important.

Other direct results of the study tours were two grant applications to conduct research on the Pop Ivan. We are still waiting for results, but the applications have high chances of success.

Also, these visits helped me understand the links between high alpine and polar environments. In 2017, I won a grant and successfully completed the project on Carbon Reservoirs and Fluxes in Terrestrial Ecosystems of the Ukrainian Carpathians. The source of inspiration for me was the alpine tundra of the Giant Mountains in the Czech Republic.

For the year 2018, numerous studies on the Pop Ivan Maramureş and the Svydovets are planned and will take place. Also, during my study visits, I discussed future collaborative research projects with the representatives of host institutions. They will also begin in 2018.

Here, I planned to provide a list of recommendations to protected areas to improve their management and to guarantee a higher level of nature conservation actions and plans above the tree line. However, after the situation on the Svydovets, when the ski-resort was lobbied by several PAs and research institutions, I realized that such recommendations in these circumstances would be nonsense. Instead, I would like to emphasize the importance of international organizations in nature conservation here in Ukraine.

First of all, I would like to provide the arguments: why to conserve nature in Ukraine? Due to many reasons, historical, geographical, orographic, economical, etc., there are still large territories here that are critically important for biodiversity on the European

scale. There are also unique primeval forests in the Carpathians that must be protected not only on paper, but also in fact.

Sooner or later, Ukraine will join the European Union. This process is unavoidable because of the cheap labor that is always in demand. Then, Ukrainian protected areas will become European protected areas. So, I think that taking care of these territories now is a matter of high importance.

International organizations can affect the reputation of anything and anybody. And probably the risk of the managers' or investors' bad reputation, meaning lower income, is the most important and effective way to protect unique ecosystems and rare species here in Ukraine.

It seems to me that the role of EUROPARC Federation may be very important in these processes. First of all, I would like to request EUROPARC Federation to include Ukrainian PAs into their development strategy and to appoint an officer responsible for this direction. Secondly, waiving membership fees for Ukrainian protected areas would be a great option for them to become members of the community of professional nature conservationists. Third aspect that may be important for the development of Ukrainian PAs are practical schools, meetings and seminars held in Ukraine but organized by international organizations and, in particular, by EUROPARC Federation. Such meetings with the staff and experts of European PAs would significantly improve the understanding of the modern standards of nature conservation by the employees of Ukrainian protected areas.

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Міністру екології та природних  
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Семераку О.М.

Копія:

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Шановний Остале Михайловичу,

Звертаємось до Вас у зв'язку із небезпечною ситуацією що склалась довкола планування гірськолижного курорту на Свидовці. Насамперед, хочемо Вам подякувати за державницьку і послідовну позицію, яку зайняло очолюване Вами Міністерство у цій ситуації. Без сумніву, відсутність позитивного висновку державної екологічної експертизи щодо можливості будівництва нового гірськолижного курорту є ключовим фактом, який унеможливило реалізацію цього проекту як такого, що становить підвищену екологічну небезпеку. Проте, беручи до уваги його інвестиційну привабливість, хочемо звернути Вашу увагу на наступне:

1. У Червоній книзі України Свидовецький гірський масив згадується **84 рази** як місцезростання рідкісних та зникаючих видів рослин та грибів. Крім того, численні збори, що містяться як в українських гербаріях, так і за кордоном, зокрема в Угорщині, Словаччині та Чехії, також свідчать про значну різноманітність видів рослин, приурочених до місцезростань у Свидовці.

2. Комплексних досліджень **сучасного стану** біорізноманітності Свидовецького масиву, зокрема тих його ділянок, на яких планується будівництво курорту, **немає**. За таких умов, **не відомо**, які рідкісні та зникаючі види зустрічаються саме там, а також які угруповання, включені до Зеленої книги України, знаходяться на цій території. А це та вихідна інформація яка має бути основою для проведення будь-яких робіт, пов'язаних із впливом на природні екосистеми. Вона регламентує, в межах яких територій господарська діяльність є можливою, а які підлягають суворій охороні. Тому, ці дослідження мають бути виконані до **початку** будь-яких робіт, пов'язаних із винесенням об'єктів в природу.

3. Такі дослідження мають виконуватись мінімум упродовж одного вегетаційного періоду, щоб охопити весь спектр видів – від ранньовесняних до тих, що квітнуть восени та інших.

4. На території Свидовця є численні ботанічні, лісові, гідрологічні та інші заказники. Дослідження їхнього стану та винесення меж в природу, що може бути виконане у межах комплексного проекту дослідження ландшафтного і біотичного різноманіття Свидовецького масиву, також підвищить ефективність природоохоронних заходів у регіоні.

Від імені Ради ботанічних садів і дендропарків України та, зокрема, Національного ботанічного саду ім. М.М. Гришка НАН України хочу наголосити на нашій готовності взяти участь у плануванні та проведенні досліджень біотичної та ландшафтно-різноманітності Свидовецького гірського масиву спільно із співробітниками природоохоронних установ Мінприроди.

Переконані, що такий підхід до справи не відлякає інвесторів, які мають серйозні наміри щодо розвитку регіону, але дозволить уникнути можливих вкрай негативних для довкілля наслідків.

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