

50 YEARS

OF THE KRKONOŠE MOUNTAINS
NATIONAL PARK





člověk a příroda

50 Years of the Krkonoše Mountains National Park

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Dobrovského 3, 543 01 Vrchlabí

www.krnep.cz

krkonose.krnep.cz

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OF THE KRKONOŠE MOUNTAINS
N A T I O N A L P A R K



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Preface

Jan Hřebačka



As I walk in the Krkonoše Mountains, I usually find myself thinking about how these mountains will look in the future. My thoughts mostly move towards considerations on everything we should do to ensure a problem-free future for the national park and its natural values. However, this year is different. Many times I have found myself thinking about what it looked like here 50 years ago, when the national park was founded. What problems our colleagues had to face, the huge amount of work they carried out, and the credit they deserve for the fact that the Krkonoše nature has been carefully protected for half a century. There were many problems and expectations, but certainly much pleasure in their work too.

The first director, Miroslav Klapka began to build the Krkonoše National Park along with a few experts. Their work was pioneering and certainly deserves our admiration today. Names such as Josef Fanta, Eva Kalašová, Vladimír Šatný, Václav Veselý, Zdena Beranová and Josef Horáček will always remain connected to the early days of the KRNAP Administration and its operations.

As time went by, it became clearer that the establishment of a national park had been necessary. The protection of the unique Krkonoše nature had to overcome many difficult

obstacles, such as the development of tourism without regard for the capacity of the territory, e.g. the construction of giant recreational buildings. Despite all the efforts of our colleagues, the face of Krkonoše suffered more scars, but the worst was still to come. In the 1980s, Krkonoše was struck by an ecological catastrophe caused by acid rain. Thousands of hectares of predominantly spruce stands gradually died off and the prognosis was not at all favourable. Luckily, in connection with the changes in the political regime, there were also enormous changes in the approach to environmental protection and the air pollution load was reduced. Thanks to the selfless help from the Face foundation and Prof. Fanta, healthy forests are returning to Krkonoše. However, the landscape character of Krkonoše is again endangered by another massive wave of construction. Although mistakes were clearly made, Krkonoše has coped with this pressure for more construction, thanks to the existence of the national park.

Since 1st January, 1994 the Krkonoše National Park Administration has also administered the forests. This makes it easier to fulfil the mission of a national park. The impact on the condition of the forest stands, and especially on the methods applied in the forests, is indisputable. During the last twenty years the forests

have experienced the most significant changes, with a move away from traditional forestry management and towards near-natural methods, supporting natural processes, leaving part of the wood mass to rot, etc. Together with many other influences, this is extremely beneficial for the development of biotopes and endangered species, which are returning to Krkonoše in relatively large numbers. Sightings of Lynx, and even Wolves and Otters, are now frequent. Symbolically, the Three-toed Woodpecker and the Corn Bunting have returned to us after more than 50 years absence. Species which had never been observed in Krkonoše before, such as the Soprano Pipistrelle, are also appearing here.

All of this is result of the work for nature which our colleagues started 50 years ago, and which all employees of the KRNAP Administration have continued ever since. They deserve our great thanks. It is the result of many conflicts of opinion, but also of the respect for the interests of nature protection by the towns and villages in Krkonoše, as well as the local inhabitants and visitors. We hope for another 50 years of support from the public.

Jan Hřebačka
Director of the Krkonoše National Park Administration



Mumlava Waterfall (photo Radek Drahný)

Preface

Andrzej Raj



After I graduated from the Forestry Faculty at the University of Life Sciences in Poznań in 1983, I decided to begin my professional career in the Western Sudetes. Although I wanted to work in national parks, fate played its role and I spent the first 4 years in the State Forest Company. I remember these working years very positively, as I gained my first experiences of caring for forest ecosystems in montane conditions. The Krkonoše Mountains were nearby and on frequent visits to the Góry Kaczawskie Mountains, in the surroundings of Bolków or Kaczorów; I could observe the beautiful panorama of the Western Sudetes with the highest belt of Krkonoše in the background. My love of, and interest in, high mountain nature led to my dream coming true when I started to work for the Karkonoski Park Narodowy (KPN).

The early months, or even years, evoked many doubts, sometimes even feelings of hopelessness. We observed and endured the results of the ecological disasters which afflicted the Krkonoše and Jizerské hory Mountains. The theoretical knowledge gained from my studies and work in the State Forest Company, were of little use in the organisation of work in the field of nature protection in the park and forest ecosystems. The variety and extent of the threats were so serious, that it was necessary to get to know and analyse them from scratch. I became convinced after

several years spent in KPN, that Krkonoše are the most beautiful mountains in the world. Creating suitable protection methods called for extensive and multi-faceted consultations with scientists and experts at home and abroad. I quickly built contacts with the Czech side, especially with the KRNAP staff, who were facing the same problems as the Polish side. Our relationships gained a new dimension and considerable momentum in the early 1990s, during a time of great political transformations in our countries. My first personal contacts I had with Jan Štursa, Jiří Flousek, Petr Štěpánek and Hana Petříková. From the start we discussed the need to harmonise the nature protection regulations on both sides of the border, primarily in the field of protecting forest ecosystems. A very important impulse for cooperation was the preparation of documents for inscription of the two national parks on the list of UNESCO MaB World Biosphere Reserves, which was successfully achieved in 1992 as the bilateral Krkonoše/Karkonosze Biosphere Reserve. Another important moment for our was also the first scientific conference 'Geo-ecological Problems in the Krkonoše Mountains,' held in Karpacz in the autumn of 1991. On the initiative of the President of the Scientific Board of KPN, Prof. Leszek Szerszeń, it was decided that this conference would be held every three years and at which the results of latest scientific and practical research from the Krkonoše region would be presented. Since 1997, these conferences has represented the cooperation between the two national parks and they had, and still have, the opportunity to present the current results of their scientific work. The most active organiser has been Jan Štursa. Active participants from the Czech side also include Jiří Flousek, Petr Štěpánek, Jan Vaněk, Josef Pivoňka, Otakar Schwarz, Petra Šťastná, and in recent years Jaroslav Andrlé. The 1990s also brought a greater intensity of work in the field of protection of forest ecosystems. Together with the former Director of KRNAP Ing. Oldřich Lábek and the former Deputy Director Ing. Jiří Novák, we managed to organise visits by foresters and scientists from the both sides of Krkonoše, when we presented the best practice in the protection of forests. There were a very friendly atmosphere, openness in the discussion and presentation of ideas, and continued after Ing. Jiří Novák became the Director of KRNAP, with the participants often including Otakar Schwarz and Ing. Jan Hřebačka, the current Director of KRNAP. A very positive result was the drawing up of bilateral rules to protect forest systems in the two national parks, which are still in use. Since 2007, when

I became the Director of KPN, I have been primarily the creator and organiser. I really appreciate the cooperation with both the previous Director Ing. Jiří Novák, and the current Ing. Jan Hřebačka. We have strengthened our relations in scientific research, publishing, nature conservation, environmental education, providing access to the parks for tourists and in social dialogue. The new funding opportunities for nature conservation that emerged with the entry into the EU have formed the basis for the organisation and implementation of many joint inter-disciplinary projects. It has strengthened our work and relationships. In many cases, this cooperation has led to the development of personal friendships.

I really appreciate our joint Polish-Czech activities in the international arena, especially the enthusiastic participation of: the Director Ing. Jan Hřebačka, the Deputy Director Jakub Kašpar, the Spokesperson Radek Drahný, the Head of the Nature Conservation Department Jiří Flousek, the Head of the Education Department Michal Skalka, and our long-time colleague Jan Štursa, now retired. Our joint participation in many international organisations, conferences, workshops, seminars and the organisation of joint events means that the Krkonoše/Karkonosze National Parks are well recognised and appreciated by the international nature protection community.

From the perspective of 26 years of work for KPN, which has almost always been accompanied by contact with colleagues from KRNAP, I can say that we have used this time well to produce harmonised rules for the protection of nature in the Krkonoše/Karkonosze. Together we have created a model system for the management of ecosystems, which are not divided by the border, but are joined by it. Of course, the persons named above are not the only ones who deserve the credit for creating the notion of "Our Giant Mountains". It is not possible in this short text to mention all of the KRNAP people with whom I have cooperated or am still cooperating. I would like to offer my sincere thanks to all of these people for the very friendly relationships after all the years of our collaboration, and on the occasion of the 50th anniversary of KRNAP, to send you my heartfelt wishes that you experience many more successes in the realisation of your career plans and much happiness in your personal lives.

Dr inż. Andrzej Raj
Director Karkonoski Park Narodowy

Krkonoše Mountains National Park 1963–2013

Jiří Bašta

The establishment of the first Czech national park was not only the climax of several decades of efforts to protect the Krkonoše nature, but also the beginning of the work, at first by a small team of experts, gradually developing through the linking of workplaces (museums, state administration bodies, forestry management), into an organisation with 5 departments and more than 440 employees in 1994 (employee numbers have fallen since then). The current condition of the protected Krkonoše nature is the consequence of the work by hundreds of staff of differing specialisations, who have either worked directly for the Administration, or innumerable staff who have cooperated externally, via scientific institutions or sub-contracting companies.

An Inhabited Mountain Range

(From the Middle Ages to the First World War)

The Krkonoše National Park was founded in a densely populated landscape. This heralded many difficulties, which the park Administration is still facing today. If we look through the KRNAP Administration photo archive, we cannot help but feeling that it predominantly documents indiscriminate anthropic pressure on the territory, which the Administration tries to prevent, rather than documenting natural values. This is in contrast with the work of artistic photographers, who capture the beauty of its natural wealth. Nevertheless, the subjects of the protection in KRNAP include human creations such as meadows or mountain works. Thus, we will remind you in brief of how the current appearance of Krkonoše developed (detailed descriptions of the territory and its development can be found in the literature, from which most of the information here was extracted. These sources will be stated at the end of this text. Most of these publications contain rich bibliographical data on published papers and journals).

Natural localities which are relatively uninfluenced by humans only form a small part of the area of the Krkonoše National Park (KRNAP) in its core areas. The presence of humans in Krkonoše during the last six centuries has



Haymaking at the Luční bouda Chalet, first half of 20th century. Cultivation of the Bílá louka Meadow ceased in 1945 (Collection of Museum of Krkonoše in Vrchlabí)

changed the mountain landscape in fundamental ways. Minerals were mined here from the Middle Ages, and the wealth of timber was used, or overused, especially as a source of energy. Natural forests, which covered the whole territory with the exception of the highest, naturally forest-free, elevations, have only been preserved in inaccessible localities, where felling was not possible, or from where it was not possible to transport or float the logs out. The new, cultural forests had strongly modified species compositions – in which Norway Spruce became dominant. In addition to working in the forest, the inhabitants of the mountains made their livings from cattle herding (the system known as mountain chalet farming was practiced from the 17th-19th centuries). The meadows and pastures, which were founded on the deforested areas, have now developed into diverse and species-rich communities with species which previously only found sanctuary on the small forest-free areas, such as the edges of the cirques or the avalanche slopes.

In the second half of the 19th century the model of mountain chalet farming was gradually abandoned. The predominantly deforested slopes had a negative impact on the water regime – demonstrated by

a series of catastrophic floods (especially in 1897). Mountain lands were more profitable when used for forestry than for agriculture. Since the cattle grazing disturbed the renewal of the forests, the large estates gradually forbade it and cattle farming in the mountains went into decline. Money from tourism gradually played a larger role in providing income for the local inhabitants. Travelling became affordable for a wider range of visitors, who were searching for the values they knew about from quality guidebooks, romantic fiction and paintings, and later from postcards and photographs. Technical and economic progress enabled roads to be built through the mountain valleys with public money (e.g. 1871 Vrchlabí–Špindlerův Mlýn, 1897 Horní Maršov–Pec pod Sněžkou). In previously inaccessible parts of the valleys, the existing logging cart-tracks were supplemented by new tourist trails built with private sector finance (e.g. 1879 Harrach Trail, 1889 Růženina Trail), or financed by the tourist clubs (1890–1893 Buchar Trail, 1891 Weber Trail). The accommodation capacity grew rapidly, which can be seen in pictures of the chalets, in which the original core – a simple cottage is dwarfed by the newer hotel extension (Luční bouda Chalet, Rennerova Chalet, Petrova Chalet etc.). Luxury hotels were built in the



Fertilising the meadows at the Klínové Boudy Chalets, 1915–1920. Manure was spread on the snow and dug into the ground in springtime (Collection of Museum of Krkonoše in Vrchlabí)



Otakar Nejedlý: *View from Krkonoše into Labský důl*. Oil on canvas, 137 × 228 cm. Here the artist has captured the area of the first Krkonoše reserve, declared by Count Harrach in 1904. A narrow logging road leads to it today, passing by three waste rock heaps left by uranium mining (Collection of the Museum of Krkonoše in Vrchlabí)

resorts in the valleys. Nevertheless, until the middle of the 20th century tourism as part of the local economy was still supplemented by private agricultural activity, made up of thousands of farming enterprises, from smallholders in the valleys up to the large chalets in the sub-Alpine zone. The economy of the valleys also included textile mills, sawmills and paper mills, all of which used the river water as a source of energy and raw materials. On the Úpa river, the millstreams were so close together that they were often connected to each other. On the Jizera, Jizerka, Labe and Malé Labe, the interval between the millstreams was greater. In periods of low flow there was not much water left in the riverbed and nobody was interested in the quality of the waste water.

However, the first environmental damage which the state tried to prevent by way of legislation was not related to industry or agriculture, but to tourism. The impulse for issuing the first Czech legal regulation on the protection of nature was excessive collecting of plants. The *Ordinance of the Imperial Governorship on the Protection of Krkonoše Flora* dates from 16th March, 1903.

In 1904 Count Jan Nepomuk Harrach established a private sixty-hectare reserve on the Strmá stráň Slopes (above the Labský důl Glacial Valley) and his foresters were given the task of protecting the montane flora. The Count even appointed a special warden for the part of his estates lying above the upper tree-line.

Forty Four Pioneer Years

(From the founding of Czechoslovakia until 1962)

The nature conservationist and botanist August Bayer pushed through the first Czechoslovak *Decree on the Protection of the Krkonoše Flora* in 1919. In this decree the Ministry of Education and National Enlightenment established what now seem to be unbelievable penalties; destroying the flora could be punished by a fine of up to 200 CZK or 2 weeks in prison! These repressive powers were delegated to the foresters and the military personnel stationed on the border, but without strict enforcement by a specialised professional body they were not effective in practice. In 1920 a decree on the same theme was also issued by the County Political Administration in Jilemnice.

The first complex proposal for the territorial protection of the Krkonoše nature was made on 30th April, 1923. The botanist Prof. František Schustler presented a proposal to establish a national park covering the Krkonoše Mountains, including Rýchory and the Jizerské hory Mountains. Schustler was the first Czech botanist who began to study complete plant communities and he realised that the protection of individual species is not effective, but that it is necessary to protect extensive areas. He stated that “I consider that establishing a reservation in Krkonoše is essential, not only from the perspective of tourism and maintaining the beauty of the landscape, but also in the interests of science, both from the purely theoretical and also the practical

and commercial aspects. It will be necessary to declare the whole of the Krkonoše Mountains, including the Jizerské hory Mountains and Rýchory, as a reservation. Of course, for national and economic reasons, it is unthinkable that such an extensive territory of forest complexes in Krkonoše could be declared untouchable and left to its own devices. Therefore, I propose that 1) the whole montane forest area of Krkonoše (...) be declared as a territory with legal protection as a partial reservation, and 2) that certain smaller territories, which are of scientific or aesthetic importance, should also be declared as reservations with total and absolute protection." Schustler further specified the protection regime and proposed a special tax to be paid by visitors to the NP, the revenue from which would finance nature protection and maintenance of tourist trails and infrastructure.

This progressive proposal ended up in the Minister's desk drawer and only fragmentary measures were adopted before the war – further decrees from the County Councils in Jilemnice and Vrchlabí on the protection of flora were issued in 1930. Thanks to the initiative from Prof. Karel Kavina the Kotelné jámy Cirques were declared a reservation (191 ha) under the name of Kotelská rokle a year later. This paid off during the road construction projects in Krkonoše in 1934–36, which were connected to the building of border fortifications. Water runoff from the road construction could influence the Velká kotelní jáma Cirque and the construction work itself was a major intervention on the south side of Krkonoše. That restrictive conditions concerning the route and the construction of this road were set out, thanks to the efforts of the General Conservation Officer from the Ministry of Education and National Enlightenment Rudolf Maximovič, was an inspiring success (despite the fact that the hairpin bends on this road were widened and the cobblestone surface of this road was covered with a layer of asphalt in the 1950s).

The years 1937–38 brought the construction of permanent fortifications. An unfinished line of light defensive bunkers was built all along the mountain ridge from Babí to Polubný. Excavation works for the construction of huge heavy bunkers were carried out on the tundra at the Bílá louka Meadow and below Mt. Kotel, and some of these excavated trenches below Rýchory were even filled with concrete. Even today, we can still see shooting and observation clearings, and new cart tracks, in the pine scrub growths and in some of the

forests. Some of the military structures and stores of construction materials have survived to this day. The still visible evidence of excavation works demonstrate how slowly montane ecosystems regenerate. In its time, the system of fortifications was the most extensive construction project carried out in Krkonoše; it was only surpassed four decades later by the volume of construction involving roads, forest tracks, ski slopes and recreational buildings.

The natural environment in Krkonoše faced increased pressure after the Second World War. The original German-speaking inhabitants were removed and the new Czech settlers could not replace them in adequate numbers – and more importantly, they had no interest in the traditional methods of cultivation, which had helped to create the local values. The owners of agricultural lands (including the hoteliers or later the weekend cottagers) were required to hand over forage crops and all of the meadows, except those at the highest elevations, had to be cut by hand. However, many of the less accessible plots of land remained abandoned and either became overgrown, or were afforested, especially with low-quality spruce monocultures. An example of a whole village which was abandoned is Suchý Důl, of which only several isolated cottages remained in the black spruce woods; in many cases the area covered by meadows around the edges of the enclaves was radically reduced.

The rejuvenation of the tourist industry in the resorts was in distinct contrast to the abandoned farms. High quality for a relatively narrow group of wealthy inhabitants was soon to be replaced by recreation for the masses. The mountains were made more accessible for non-sportspeople by the construction of chairlifts (the pre-war construction of the Janské Lázně cable car from 1928 was followed by erection of the first chairlifts to Pláň in 1947 and to Mt. Sněžka in 1949–50).

Thanks to the efforts of the naturalists Alois Zlatník, Odolen Kodým, Karel Kavina, Zdeněk Pilous, Josef Mařan and the employees of the former State Monuments Administration, later the State Institute for Conservation and Nature Protection, Jaroslav Veselý and Zdeněk Vulterin, a total of eight state nature reserves (SNR) were established by a decree from the Ministry of Education on 4th March, 1952 – the first stage of the declaration of the Krkonoše National Park. The redesignated strict Kotelné jámy Reserve, along with the new Pančická louka SNR

and Labský důl SNR, were surrounded by the partial Západokrkonoská (Western Krkonoše) SNR. The strict Úpská rašelina SNR and Obří důl SNR lay inside the partial Východokrkonoské (Eastern Krkonoše) SNR. The strict Černohorská rašelina SNR lay outside of the large partial reserves. Supervision of the reserves was carried out by the Nature Protection Officers Jindřich Ambrož, Josef Šourek and Zdeněk Pilous, who were responsible to the Regional National Committee in Hradec Králové. This staffing level was insufficient, and it only helped a little when the Mountain Rescue Service was also given the task of protecting nature, on the basis of new guidelines issued in 1954.

High mountain afforestation was permitted in both of the partial reserves, whereas the strict reserves were left to natural processes. After decades of inactivity, this was a great breakthrough for the protection of the most valuable parts of the Krkonoše Mountains. This was preceded by *Act No. 41/1956 Coll., on the State Nature Protection*, the first law of its kind in our country, by four years. It was rather vaguely formulated and had its limitations – the need to protect nature and landscapes in it was motivated by anthropocentric motives, for the good of the people. The practices in the 1950s were idiosyncratic: Mt. Medvědí in the Western

Krkonoše SNR had a five-storey uranium mine drilled into it. An extensive ore research study was sited directly on the slopes of Mt. Sněžka in the Obří důl SNR, and after a conflict with the employees of the mining organisation, the conservationist Josef Šourek was removed from his job for political reasons.

First Decade, First Steps (1963–1973)

In 1962 the first *'Land Use Plan for the Krkonoše Region'* was issued, the subject of which was certainly not nature protection, but in which it was stated, that there should be a national park in Krkonoše. The Krkonoše National Park (KRNAP) was designated by *Government Regulation No. 41/1963 Coll.* on 17th May, 1963. The details concerning nature protection in the park and the establishment of the KRNAP Administration were set out one week later by the Ministry of Education and Culture in *Decree No. 42/1963 Coll.* Both of these regulations came into validity on 10th June, 1963, when they were published in the Collection of Laws. In the summer of 1963 we began to build the KRNAP Administration,

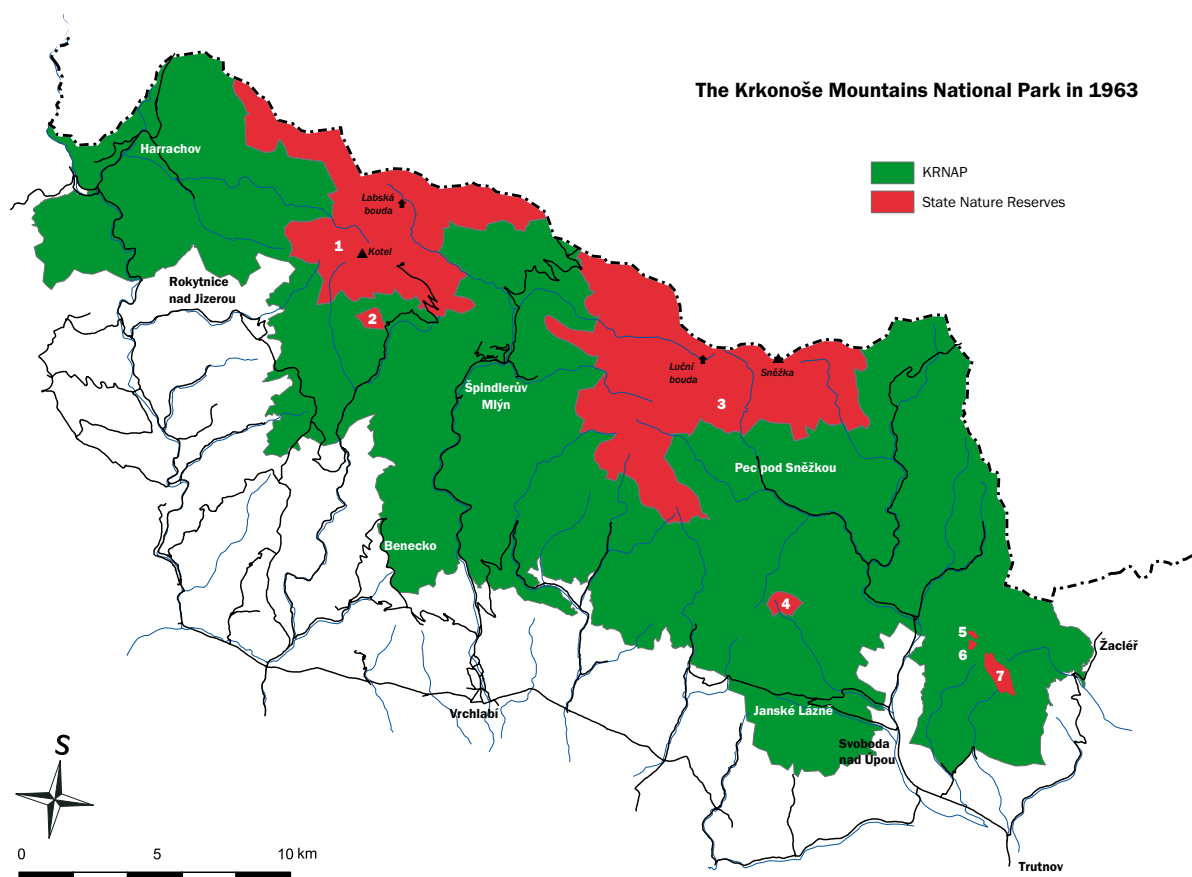


The start of signposting the state nature reserves in the field, 1965 (photo Miroslav Hladík)

a budget organisation under the East Bohemian Regional National Committee, with its seat in Vrchlabí, almost on a greenfield site – in fact it was built on several chairs on the 2nd floor of the Vrchlabí Chateau. The first six months were spent building the organisational basis of the institution, which would later have a fundamental influence on the mountain landscape as well as its inhabitants and regulate millions of visitors. Cooperation with the Polish equivalent was also established. The Karkonoski Park Narodowy (KPN) had already been established on 16th January, 1959, and many mutual issues, especially concerning tourism on the state border, were solved at joint Czech-Polish meetings.



Above the Modrý důl Glacial Valley, Velká Úpa and Mt. Světlá in the background. Tourist trail from the 1960s, which had not been closed yet, in the foreground (photo Miroslav Hladík)



The Krkonoše Mountains National Park as it was founded in 1963. Red markings for the first phase of KRNAP, in which the most valuable territories continue to be protected as State Nature Reserves (SNR):

- 1 Západokrkonoská (Western Krkonoše) - including the Pančická louka, Labský důl and Kotelné jámy SNRs), declared in 1952
- 2 V Bažinkách, 1960
- 3 Východokrkonoská (Eastern Krkonoše) - including the Obří důl and Úpská rašelina SNRs), 1952
- 4 Černohorská rašelina, 1952
- 5 Rýchorská květnice, 1960
- 6 Rýchorská studánka, 1960
- 7 Dvorský les, 1960

(map Jana Kalenská, 2013)



Modré sedlo Saddle, mid-1960s. The cart track is covered in loose stones; it was later resurfaced with asphalt. Tourists had trampled a wider parallel trail further downhill, which was soon affected by erosion (photo Miroslav Hladík)

The first Director of the KRNP Administration Miroslav Klapka studies the design for the terrain information panels on the border of KRNP, 1967 (photo Miroslav Hladík)



The beginnings of outdoor promotion of nature protection in Krkonoše in the 1960s and 1970s, just like the 'skirted' trail markers, demonstrate the contemporary aesthetics of rogue visitors (photo Miroslav Hladík)



A long-term problem which KRNAP has always faced, but in which we have only recently begun to see success, is the illegal dumping of waste. The picture shows a pile of waste by the Luční bouda Chalet, in close proximity to the Bílé Labe flow and in the middle of the state nature reserve. Late 1960s (photo Miroslav Hladík)



In addition to repairing the trails, effective measures were also taken to direct the movement of tourists. Here the Administration staff are building the Šmíd Vantage Point on the eastern slopes of Krkonoše. 1960s (photo Miroslav Hladík)



As early as 1968, the wooden railings at the Šmíd Vantage Point were replaced with a panoramic copper contour of the surrounding landscape with descriptions according to a design by the academic painter Jiří Škopek (photo Miroslav Hladík)

In 1964 the KRNAP Administration established its Scientific Council and its Voluntary Rangers Corps, both of which still function today, although in modified ways, as well as an Architect's Group. The Advisory Council included representatives of local and county administrations and was soon transformed into the Commission of the East Bohemian Regional National Committee for KRNAP. Information on the activities of the national park were to be provided in the *Zprávy KRNAP* bulletin (1964–67), edited by Miroslav Hladík, while the professional public were targeted in the reviewed proceedings *Opera Corcontica* – a scientific journal which has been published continuously for 50 years. Its first editor (1964–71) was Ing. Josef Fanta.

Three professional rangers – Herbert Berger, Josef Buchar and František Jindříšek began their work. Until this time, terrain monitoring activities had only been carried out by the Krkonoše Mountain Rescue Service, with which the KRNAP Administration cooperated closely. This is why the establishment of the Voluntary Ranger Service, which grew to 85 members by 1965, was of such importance. Many of the voluntary rangers were also members of the Mountain Rescue Service. The number of paid rangers gradually increased and the KRNAP territory was divided into seven protection districts. The signposting of nature reserves and the national park itself began, but was not completed until 1967.

The regulation of motor vehicles began. However, a total of 402 long-term permits to drive into the new forbidden areas, predominantly to allow vehicle access to catering establishments, had been issued by 1964. The development of motorism followed on from the government's support for satisfying the consumer needs of the citizens, and especially the individualisation of transportation after 1989, which proved to be one of the fundamental influences on the territory. By 1992 the number of permits issued rose to 5,544, the maximum number of permits were issued in the year 2000 – 26,000, but the annual number fell to 9,900 permits in 2012. These numbers, which were ascertained using various methods, are not entirely comparable. They include long-term permits, as well as documentation of one-off entries enabling tourists to reach their accommodation, e.g., to the Špindlerova bouda Chalet. We must also realise, that until 1974 it was possible to drive freely and directly into the Western Krkonoše State Nature Reserve, to the Zlaté



Building the car park at the Vrbatova bouda Chalet (photo Miroslav Hladík)



Normal traffic situation in Krkonoše until 1974 (photo Miroslav Hladík)



A bus shelter has since been built here. Part of the car park from the 1960s has been recultivated. The paved area around the road turning point is more than sufficient for the needs of parking and occasional unloading of material for trail repairs. Photo from the early 1970s (photo Miroslav Hladík)

návřší Hill! In an attempt to regulate the traffic, the KRNAP Administration extended the car park here in 1965, which contravened the pre-war regulations covering the construction of the Masaryk Road from the 1930s. The Špindlerova bouda Chalet was freely accessible by car until the end of the 1980s.

What was the condition of the territory when the Administration took responsibility for it? At first the increasing numbers of visitors were accommodated

in decaying hotels and chalets, but also in new accommodation facilities from the mid-1960s onwards. On the other hand, the consequences of depopulation became apparent. The resident population on the territory of KRNAP fell by 40-80% between 1930 and 1961. As we have indicated, this brought the end to traditional cultivation on the mountain meadows. In the subalpine zone this did not worry anybody yet, as afforestation projects were underway in the partial reserves,

while non-intervention in the forests was in accordance with the previously conservative approach to nature protection. Even in its early years the KRNAP Administration tried to help organise the hay cutting at lower elevations. The reconstruction and maintenance of the mountain trails, which had been neglected for two or three decades, was a huge task. Considering the shortage of construction capacity in the centrally planned economy, it seemed to be most effective to employ our own road menders, buildings maintenance staff and drivers and to establish our own trucking capacity (during the 20 years after the revolution this model was gradually abandoned).

In 1967 the KRNAP Administration took over the Museum of Krkonoše in Vrchlabí. The decaying monastery building was immediately closed, but the reconstruction work dragged on for an unbelievable 17 years! In the meantime, public education was carried out by way of the first educational trails, leading from the Obří důl Valley to the Úpské rašeliniště Peatbog and over Mt. Studniční hora. They were opened on the occasion of the Krkonoše session of the Permanent Committee for Education of the IUCN (International Union for Nature Conservation). In addition to the information panels in the terrain, a printed guide by Věra Komárková was also published. The slim *Zprávy KRNAP* newsletter was unable to fulfil the need to establish contacts with the widest spectrum of the general public, so it was transformed into the *Krkonoše* popular science magazine from 1968 onwards.

The second half of the first decade was unfortunately marked by the revolutionary events of August, 1968. The Director Miroslav Klapka and his Deputy Josef Fanta were removed from their posts for political reasons in 1969. The KRNAP Administration was led from 1970 in the spirit of normalisation by Václav Veselý, although he passed away in 1973 due to long-term alcoholism.

As a high-class tourist destination, the Krkonoše Mountains also became the subject of government interest (the Government Committee for the Complex Development of the Krkonoše Region was established in 1972) and the First Summer School for Young Environmentalists was held at the Richtrový Boudy Chalets — in this way the KRNAP Administration began its long-term educational efforts.

Building the Institution and the Collapse of Forest Ecosystems (1974–1989)

In the mid-1970s the estimated visitor numbers in KRNAP reached 7-8 million visitor days per year. The KRNAP Administration prepared a 'Concept of Operations' up to 1985, with similar aims to today's Management Plans. This document attempted to solve conflicts between recreational usage of the territory and the protection of nature. Quiet zones were delineated from 1985 onwards, with stricter rules than in state nature reserves, as movement away from marked tourist trails and making noise were forbidden. These measures were introduced on the basis of the Territorial Plan for the Krkonoše Large Territorial Unit, and were intended to protect contiguous areas for the undisturbed lives of large vertebrates. On the contrary, the Concept also defined areas into which tourist movements would be directed. Some of the quiet zones covered the same areas as the reserves, and together with them, they covered a greater area than the current first and second zones. In 1980 the regime in the two largest reserves was made stricter, when the previously partial Západokrkonošská (Western Krkonoše) SNR and Východokrkonošská (Eastern Krkonoše) SNR were merged with the strict SNRs (Labská louka, Pančická louka and Kotelné jámy; Obří důl and Úpská rašelina) and redeclared as the Prameny Labe (Labe Springs) and Prameny Úpy (Úpa Springs) SNRs. The extremely dense network of tourist trails was optimised in several steps and visitor movements were concentrated onto several of them. However, the high visitor numbers meant it was necessary to repair and widen these trails and unsuitable basal materials were used to resurface them. The damaged supply roads to the Labská and Luční bouda Chalets were asphalted and for twenty years the bed of the Schustler Trail cut through the Úpské rašeliniště Peatbog. The closed Trails included those from Růženčina zahrádka to the Hanč Monument, across the summit of Mt. Kotel, and a section of the link between the Labská and Vosecká bouda Chalets across the Pančavská louka Meadow and the trail from Kozí hřbety Ridges at the foot of Mt. Luční hora; the route of the educational trail had already been moved away from the closed trail across Mt. Studniční hora and the Úpská hrana

Cliff. The trail across the Krkonoše summits was closed shortly after the chairlift to Mt. Medvědíň was opened in 1978 – the increased frequency was moved onto the cart trail built during the construction of the road to the Vrbatova bouda Chalet. The trails through the Labský důl and Obří důl Glacial Valleys were temporarily closed in the 1980s.

The most visible field of activity for the general public was the massive construction of visitor infrastructure. The following educational trails were built within the national park and mostly within the reserves: Na Rýchorách (1974), Prameny Úpy (reconstructed original trail, 1976), Prameny Labe (1977) and Černohorská rašelina (1978). An educational trail was also opened in the Vrchlabí Chateau Park in 1977. Aviaries with a zoological exposition of smaller local fauna were erected around the park walls. A minizoo in the neighbouring Morzine Chapel Gardens, which also displayed larger vertebrates, was added in 1983. (The Administration took over

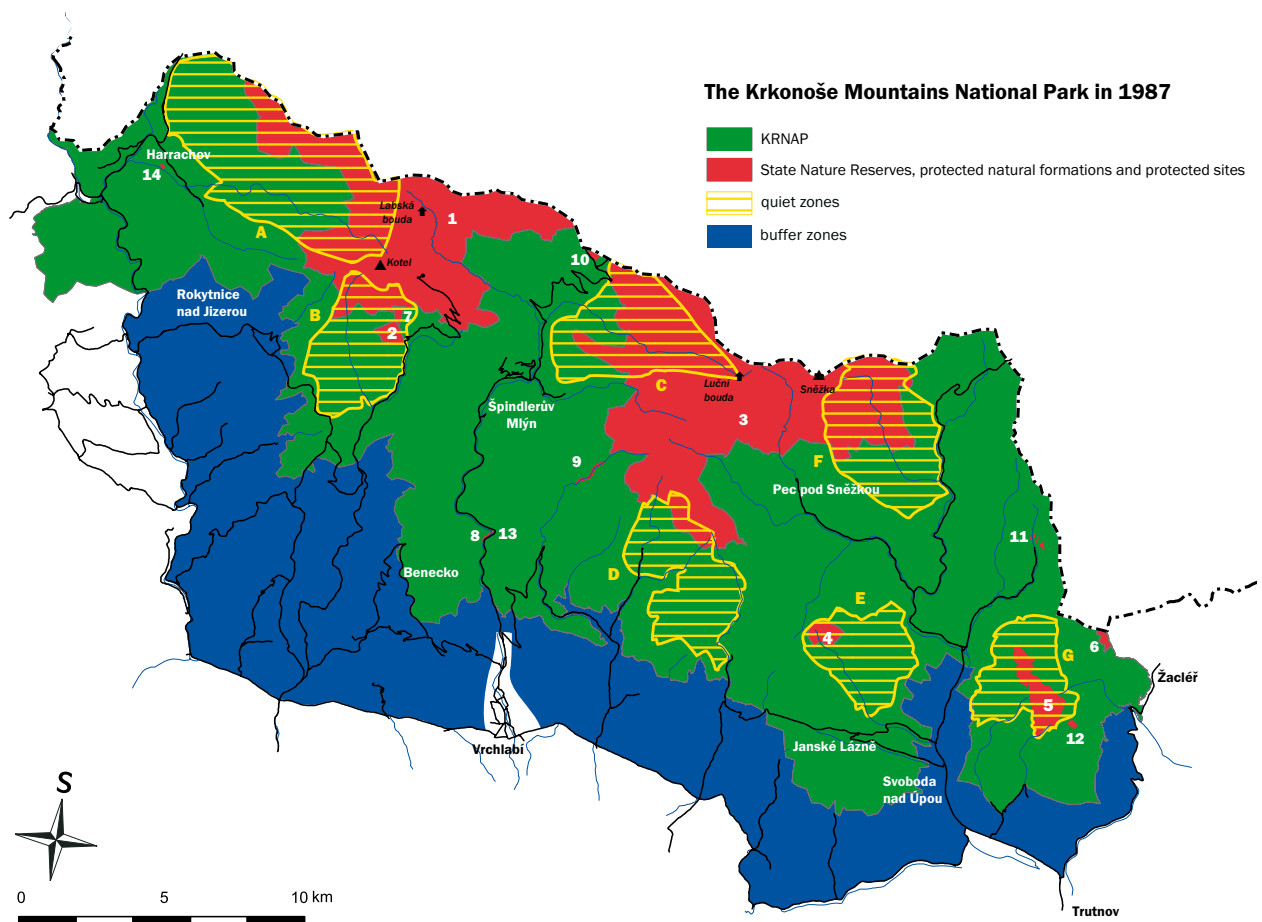
the chateau park shortly after it was founded and renovated it until 1970. The zoological exposition was closed down in 1994, although one part of it is still in operation today – the sanctuary for handicapped animals, which has been moved to a site by the walls of the monastery garden. The park itself underwent a major renovation in 1998–99, during which all of the intrusive renovations from the 20th century were removed).

The KRNAP Administration took over the Museum of Krkonoše in Jilemnice in 1979. After a partial reconstruction of the building, a permanent exhibition entitled 'The Birth of Czech Skiing' was opened in 1983. In 1980 the museum was expanded to include the Monument to Fallen Patriots in Paseky nad Jizerou. The literary section was expanded to include an exhibition on the Czech Violin School.

On the 28th April, 1984 the main building of the Museum of Krkonoše in the former Augustinian



Opening the educational trail in the Chateau Park in Vrchlabí on 24th June, 1977. The idea of transforming the park into a botanical garden is illustrated by the building of the Alpine rock garden in the foreground (removed during reconstruction of the park in 1998) (photo Jiří Bruník)



The protection of the territory of Krkonoše National Park was further differentiated from its foundation to the end of the 1980s. The existing small-scale specially protected areas were modified and more were declared (state nature reserves, protected natural formations and protected sites), while the disturbing influence of tourism was to be regulated by the quiet zones. After lengthy deliberations, the buffer zone was declared in 1987.

State Nature Reserves:

- 1 Prameny Labe (comprising the merged Západokrkonoská, Pančická louka, Labský důl and Kotelné jámy SNRs), redeclared in 1980
- 2 V Bažinkách, 1960
- 3 Prameny Úpy (comprising the merged Východokrkonoská, Obří důl a Úpská rašelina SNRs), 1980
- 4 Černohorská rašelina, 1952
- 5 Rýchory (comprising the merged Rýchorská květnice, Rýchorská studánka and Dvorský les SNRs), 1976
- 6 Boberská stráž, 1980

Protected Natural Formations:

- 7 Mechové jezírko, 1985
- 8 Labská soutěska, 1977
- 9 Klínový potok, 1977
- 10 Slezské sedlo, 1986
- 11 Albeřické lomy, 1986
- 12 Slatina u Rýchorského dvora, 1986

Protected Sites:

- 13 Herlíkovické štoly, 1980
- 14 Anenské údolí, 1985

Quiet Zones (1978–1990):

- A Mumlavská
- B Kozelská
- C Bílé Labe
- D Tetřeví
- E Světlá
- F Jelení
- G Rýchorská

(map Jana Kalenská and Jiří Bašta, 2013)



Opening the new enclosures in the minizoo in the Morzine Chapel gardens during the KRNAP 20th Anniversary Conference, 1983 (photo Jiří Bruník)

Monastery in Vrchlabí was reopened to the public after being closed for 17 years. The previous historical and geographical concept focussing on the history of workers' movements was abandoned. An ultramodern ecological exposition entitled 'Stone and Life' became the new flagship of the KRNAP enlightenment programme. Nineteen stops were prepared according to designs by Jan Jeník and Jan Štursa, where the traditional display cabinets were replaced by an effective multimedia programme and a functional model of a mountain stream with live animals (guided tours of shorter and longer durations were offered. The exhibition underwent a technical modernisation in the 1990s). As recently as 1995, the ecological content was supplemented by a new exhibition entitled 'Man and Mountains'. We are currently preparing a project for a new large-scale installation, which will integrate ecological and historical themes into a whole, with the use of contemporary technology.

Public relations were primarily the task of the Terrain Service Department, reorganised into three Territorial Centres and the Biological Production Centre (i.e. nursery and support for the live animal exhibitions). Terrain Service Information Centres in Špindlerův Mlýn, Harrachov and Pec pod Sněžkou, in which the professional park rangers were based, were opened in 1977–79. The main Information Centre in Vrchlabí, linked to a small history and geography exhibition of the Museum of Krkonoše and an exhibition hall, came into operation in 1981. This was followed by the opening of the Information Centre in the Obří důl Glacial Valley, with a permanent exhibition entitled 'Obří důl – Jewel of Krkonoše' (1982), near the chairlift to Mt. Sněžka. The Information Centre in Rokytnice nad Jizerou with a permanent museum exhibition was completed in 1985. All of the centres were equipped for holding lectures and film projections. In 1976 the KRNAP Administration purchased the Rýchorská bouda Chalet, which was renovated for the use of

the Czech School of Nature Protection, and opened in 1986 (the centre was renamed the Krkonoše Centre for Ecological Education after 1990).

This massive development of ecological-cultural educational and enlightenment activity is closely linked with the name of Jiří Svoboda, who served as director in the years 1974–1985. The normalisation era KRNAP Administration grew rapidly at that time (from 81 employees in 1973 to 200 employees in 1983). However, its unity was damaged by the establishment of a separate Department of the Chief Architect for the Krkonoše Region in 1974. The removal of the urbanistic development policy for Krkonoše from the competence of the KRNAP Administration was a precursor of the ever increasing pressure for construction, connected with the recreational usage of the territory, which clearly

gained precedence over nature protection. The improvements to the road network (massive retaining walls and cuttings disturbed the character of the Labe and Úpa valley floors; roads were often widened at the expense of riverbeds, e.g. the Labská soutěska Gorge, which was later declared a nature monument, was badly damaged), were followed by a massive wave of rebuilding chalets into company recreation centres in the 1970s. The increasing number of beds caused an increase in traffic and problems with the release of poorly treated or untreated waste water (although this situation was improved by the construction of central water treatment plants in the late 1980s, satisfactory solutions were found much later). The completion of controversial projects from the 1960s (Labská bouda Hotel, hotel Horizont), was followed by the construction of giant trade union and other



The Director of the KRNAP Administration Jiří Svoboda with the Minister of Culture Milan Klusák on a tour of the devastated historical houses, which were reconstructed into the Administration's Main Information Centre (photo Jiří Bruník)



The main KRNAP Administration Information Centre in Vrchlabí was opened in May, 1981 (photo Jiří Bruník)



The Museum of Krkonoše in Jilemnice occupies the Harrach Chateau. The KRNAP Administration took control of the building in 1979 (photo Jiří Bruník)



'White Trails' exposition on skiing, opened by the KRNAP Administration in the Museum of Krkonoše in Jilemnice in 1980 (photo Jiří Bruník)

reconvalescence centres (just in Špindlerův Mlýn they were the Pochodeň – Flaming Torch, Rudý prapor – Red Flag, State Planning Commission), as well as concrete-panel housing estates in the main resort centres. Accommodation capacity was primarily built within the built-up areas of the resorts, but the downhill skiing centres also saw a great expansion. The ski lifts and downhill pistes encroached into the reserves, while in other places the skiing facilities approached the reserve boundaries. After the Polish observatory and restaurant were built (1975), Mt. Sněžka was again endangered by megalomaniac plans to construct a new chairlift and the Czech Chalet.

The aforementioned Concept for the work of KRNAP first formulated a move away from the conservationist approach to nature protection, which, in practice, only meant the defence of ever diminishing spaces and worsening conditions for montane communities. Contacts with contemporary trends in nature protection were enhanced by the KRNAP Administration's membership of the IUCN from 1979. The Administration then held a series of expert conferences. Work on maintaining species diversity began, e.g. founding and operating a gene fund garden and the rescue breeding of the Capercaillie, with the aim of reintroducing endangered organisms to the wild at a later date. Photo 27, 31, 36, 38 After a systematic inventory of the natural fund of the whole park was carried out in the second half of the 1970s; the KRNAP Administration has continued to monitor all elements of the environment. The Administration attempted to support care for the meadows, which were either endangered due to lack of interest, or on the other hand, by the intensification of livestock production with the usage of artificial fertilisers and overloading the grasslands with excessively high concentrations of cattle (e.g. Sklenářovice, Albeřice). The Terrain Service obtained mowing equipment, which was also available for use by chalet owners and weekend cottagers. The Administration also investigated the possibility of sheep grazing.

The Concept regarded tourism as the biggest problem, but did not foresee the rapid and visible damage caused to the forests by the transfer of sulphurous emissions from the so-called 'Black Triangle' – the brown coal regions in northern Bohemia, in East Germany and in south-western Poland. A model case on a smaller scale already existed in the vicinity of KRNAP, as the



Since the 1950s the Museum of Krkonoše in Vrchlaví has occupied the Augustinian Monastery building. The KRNAP Administration took control of the museum in 1966 and carried out a demanding renovation project, which dragged on for 17 years (photo Jiří Bruník)

forests in Trutnov District were damaged by emissions from the electric power station in Poříčí. The KRNAP Administration began measuring the concentrations of SO_2 on the Labská louka Meadow in 1978. After the climatic inversion at the turn of 1980, the emission damage to the Krkonoše spruce stands became more clearly visible. Unprecedented chemical interventions against the infestation of Larch Bud Moths were carried out on the national park territory during the years 1979–81, with the greatest intensity during 1980. The aerial spraying indiscriminately affected other animal groups and water sources. The forests which were weakened by emissions, and from 1984 by the increasing infestations by Spruce Bark Beetles and other pests, rapidly withered and died. This exposed the weaknesses of the nature protection at that time. For example, the possibility of using chemical interventions was expressly permitted in the protection conditions of the quiet zones. The interests of the KRNAP Administration and the East Bohemian State Forests were absolutely opposite. The priority for forestry management, even in the conditions of the national park, was the production of timber. The emission damaged stands, made accessible by an extensive network of logging roads, were harvested using clearcut methods, even on the territories of the reserves.



Hollow tree – part of the 'Stone and Life' ecological exposition, opened in Vrchlaví in 1984 (photo Jiří Bruník)



Signpost marking the state nature reserve at the trail crossing below Mt. Kotel, early 1980s. Visitor numbers in the reserve were a major problem, which fragmented the landscape into smaller sections, but partially solved by reducing the number of trails. The green-marked trail on the right of the photo, leading across the summit of Mt. Kotel to Mt. Harrachovy kameny and the Vrbatova bouda Chalet, was closed shortly after this photo was taken. Two rows of defensive bunkers on Mt. Kotel from 1937 seriously disturbed the surface of the arctic-alpine tundra (photo Jiří Bruník)



Vladimír Vávra and Jan Štursa with the graphic artist during preparation of the exposition at the Information Centre in the Obří důl Glacial Valley (photo Jiří Bruník)



The Terrain Information Centre in Špindlerův Mlýn was opened in 1977 (photo Jiří Bruník)



Opening the Information Centre in Pec pod Sněžkou, 1979 (photo Petr Chytrý)



The interior of the Information Centre in Harrachov (photo Jiří Bruník)



The interior of the small exposition in the Information Centre in Rokytnice nad Jizerou, opened in 1985 (photo Jiří Bruník)



Rýchorská bouda Chalet around 1970



Extension to the Rýchorská bouda Chalet for the needs of the Centre for Ecological Education; still known at that time as the Educational Centre for State Nature Protection, opened in 1986 (photo Jiří Bruník)

At the General Assembly of the IUCN in Madrid in 1984, KRNAP was included among the 12 most endangered national parks in the world due to its emission-damaged ecosystems. Certain progress in territorial protection turned out to be only on paper. *Government Regulation No. 58/1986 Coll.* became valid from 1st January, 1987 – nine years after inter-ministerial consultation draft (!) – on the establishment of the KRNAP Buffer Zone, which aimed to protect the national park from disturbing influences from the surroundings.

The symbolic icing on the cake of the environmental crisis in Krkonoše, which dragged on for many years, was the removal from office of the Administration's Director Vladimír Černoščík (in office between 1985–89), who did not defend the interests of nature protection as much as the interests of opponents of the Administration, and the Ministry of Culture's rejection of the plans to build a new Česká bouda Chalet and a chairlift on Mt. Sněžka in November, 1989. Although these events did not end the anthropic pressure on Krkonoše, the conflicts over the usage of nature are more civilised and orderly after the socialist political mechanisms were dismantled.



The series of reconstructions of main roads leading to the Krkonoše resorts and to the border crossings was begun in 1969. By 1979 the Horní Maršov—Pec pod Sněžkou (depicted here), Vrchlabí—Špindlerův Mlýn, Temný Důl—Pomezní Boudy and Kořenov—Harrachov roads were gradually widened by Polish construction companies. Later the Harrachov bypass was built – the more unnecessary the road, the wider it was built! (photo Miroslav Hladík)



One of the most beautiful meadows at Labská (Zadní Krausovy Boudy Chalets) must give way to the Revolutionary Trade Unions' Pochodeň (Flaming Torch) Reconvalescence Home, completed in 1984 (later Arnika, today a private hotel). The deep gullies around the site are clearly visible - the water régime was irrevocably altered, the runoff rate was accelerated (photo Jiří Bruník)



Members of the political elite primarily considered Krkonoše to be a first-class recreational region. As early as 1969, the KRNAP Administration was involved in the choice of site for the convalescence home, later known as Rudý prapor – Red Flag, which was renamed Horal – Mountaineer before it opened in 1989. The victims of this construction work were the landscape character and also the fringes of the forest on the upper edge of Svatý Petr (photo Miroslav Hladík and Jiří Bruník)





Western Krkonoše as seen from Pláň, early 1970s. Rides have been felled on Mt. Medvědí to allow for downhill ski runs and a chairlift, which was not actually built until 1978. The downhill runs at that time wound through the forests and did not disturb the landscape character as much as the modern day wide and straight ski runs. The dark forests are only disturbed by windfall areas after the windstorm in November, 1966. Air pollution damage is not yet visible, as this became apparent at the end of the 1970s (photo Miroslav Hladík)



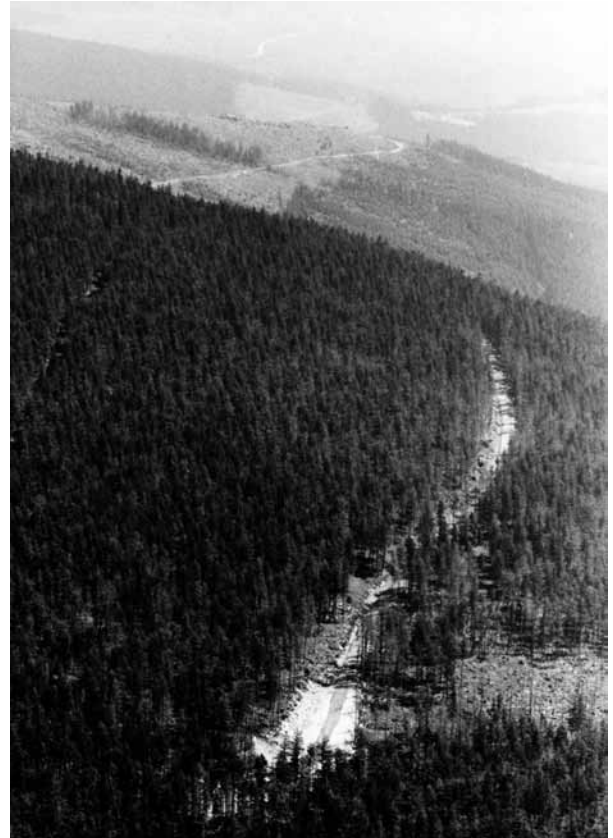
Sedmidolí, the Mt. Malý Šišák massif and the Kozí hřbety Ridges from the Šmíd Vantage Point around 1970. On 4th–5th November, 1966 a wind calamity destroyed 420 ha of forest (more than 250,000 m³ of wood mass). Among the consequences were the clearcut below the Špindlerová bouda Chalet (photo Miroslav Hladík)



For two long decades the torsos of dead and dry trees were an integral part of the Krkonoše scenery, although in most areas the remnants of the dead forests were unmercifully felled and removed (photo Jiří Bruník)



Emission calamity. Heavy machinery enters the affected forest stand and a logging road is built from the Medvědí boudy Chalets to the floor of the Labský důl Glacial Valley (1980s, photo Krkonoše National Park Administration archive)



The end of the logging road, later known as Lavina – Avalanche. The dead forest on the floor of the Labský důl Glacial Valley is still standing, the clearcuts which scar the slopes of Mt. Vysoký Kolo in the background, were created using forestry machinery which was imported from Western Europe. The manipulation area at the end of the logging road was recultivated in 2009 at a cost of 4 million CZK! (photo Krkonoše National Park Administration archive)



The Kockum tractor was the precursor of the more widespread usage of heavy equipment in the forests (photo Krkonoše National Park Administration archive)



Young environmentalists learn about Krkonoše flora under the leadership of Jan Štursa (1975, photo Jiří Bruník)



Young people´s work party below the Lesní bouda Chalet. First half of the 1970s (photo Miroslav Hladík)



Directing visitor movements on the Czechoslovak-Polish Friendship Trail was always one of the main points of cooperation with the Karkonoskiego parku narodowego (KPN) Administration. Sněžné jámy Cirques, late 1960s (photo Miroslav Hladík)



Trails affected by erosion could look like this (photo Krkonoše National Park Administration archive)



Conference of the KRNAP Administration with municipal authorities and organisations working in the region, December, 1974. The slogan 'Protecting Nature for People' emphasizes the predominantly anthropocentric perception of nature protection. The slogans in the meeting rooms have now changed, so we will see what the future brings (photo Miroslav Hladík)



Laying cables from the Labská bouda Chalet to Martinova bouda and to the Sněžné jamy Cirques, probably in 1969. As with Mt. Sněžka the electric cable and water mains run from the Polish side, while the cable to the Sněžné jamy Cirques runs from the Czech side. Connecting Krkonoše to mains electricity and water has continued from 1965 until today. During these works the surface cabling has been replaced and nearly all of the previously unconnected localities have been electrified (of the large enclaves, the Klínové Boudy Chalets was connected in 2008). We must also mention the lines of telecommunication cables. Linear constructions are a sensitive matter, which are still carefully monitored (photo Miroslav Hladík)



Opening the 'Man and Montane Nature in the 20th Century' conference, September, 1977 (photo Jiří Bruník)



Fifth International Ascent of Mt. Sněžka by Pioneers and Youth (photo Jiří Bruník)



Employees of the KRNAP Administration in the May Day procession in 1977 (photo Jiří Bruník)



The 'Education for Care for the Environment' conference, 1978. Prof. Bohuslav Svoboda, the Chairman of the KRNAP Scientific Council at the time, is speaking (photo Jiří Bruník)



Meeting of KRNAP Volunteer Rangers at the Vrchlabí Chateau in 1978. Seated from the left: Jiří Pícha, Václav Veselý, Jiří Svoboda, ?, Petr Štěpánek (photo Jiří Bruník)



One of the first three professional rangers, Josef Buchar from Špindlerův Mlýn and volunteer ranger Struna pose in uniforms for the KRNAP Administration (photo Jiří Bruník)



Medals of Honour issued by the KRNAP Administration to celebrate the 15th anniversary of the founding of the national park



Excursion of the Forestry Section of the Czech Association of Scientific and Technical Societies, resting by the Labská bouda Chalet, 1979. Seated third from the left is Ing. Theodor Lokvenc, the author of the project for high-mountain afforestation (photo Václav Vašina)



The IUCN Committee for Education are shown the gene bank at the KRNAP Administration's nursery in Vrchlabí, 1982 (photo Jiří Bruník)



Prof. Jan Jeník lectures at the 'Mission of National Parks to Protect Natural and Cultural Values of Territories' conference, 1983. Prof. Bohuslav Sýkora on the right, Prof. Emil Hadač in the foreground (photo Jiří Bruník)



'Young Hands for Krkonoše' event – repairing the trail and its drainage between the Martinova and Labská bouda Chalets, 1984 (photo Jiří Bruník)



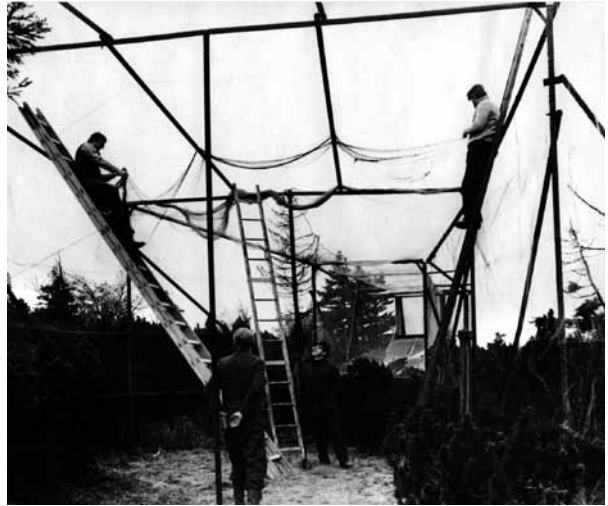
Photo to promote the cooperation between the KRNAP Administration and other state organisations from the second half of the 1980s: KRNAP Ranger – member of Mountain Rescue – KRNAP Ranger – Public Security (Police) officer – KRNAP Voluntary Ranger who was also a Public Security Auxiliary Guard – Border Guards officer (photo Jiří Bruník)



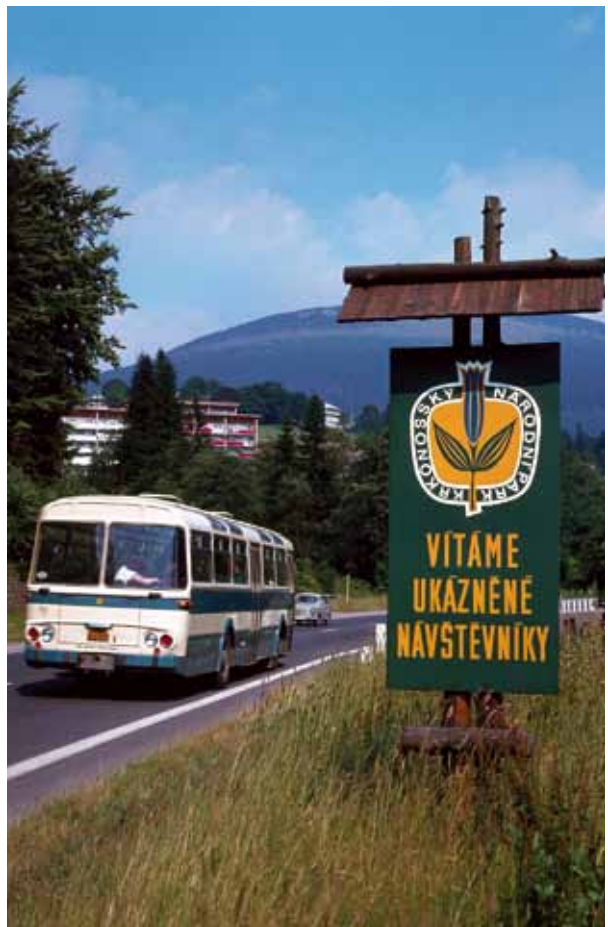
The educational trails were supplemented by three hiking trails named Eagle Owl, Fox and Grouse. This was part of the attempt to concentrate visitors into defined tourist zones, away from the quiet zones (photo Jiří Bruník)



Prof. Emil Hadač, a member of the KRNAP Administration's Scientific Council, lectures to an excursion of secondary school students at Rýchory (photo Jiří Bruník)



The Krkonoše ornithologists were involved in the Baltic international monitoring event. The pictures shows the assembly of a Heligoland bird trap at the Slezské sedlo (early 1980s) (photo Jiří Bruník)



Example of a billboard by the road from the early 1980s (photo Jiří Bruník)



A chemical battle against the infestation by Larch Bud Moths in Krkonoše took place in the years 1978–81. Spraying the active substance also affected other insects and subsequently vertebrates too (photo Jiří Bruník)



The trail to Mt. Sněžka passes under the chairlift at Mt. Růžová hora. The integrity of the stone trails was destroyed by millions of footsteps. The trails were not reconstructed until the 1990s. (photo Krkonoše National Park Administration archive)



In addition to printed and laminated panels and painted metal panels at the stops on the educational trails, more concise wooden panels with hand-carved texts were also installed later (1980s, Josef Buchar) (photo Jiří Bruník)



Press conference at the Main Information Centre in Vrchlabí. The Administration staff in attendance are (from the front left) Miroslav Hladík, Josef Jareš, František Janalík, Jan Vaněk, Vladimír Šatný, Jiří Svoboda and Jan Štursa. The ecological reporter Josef Velek is sitting among the journalists (early 1980s, photo Jiří Bruník)



The construction of the new Výrovka Chalet burdened the environment in the state nature reserve through increased traffic, as well as the dumping of waste. (late 1980s, photo Jiří Bruník)



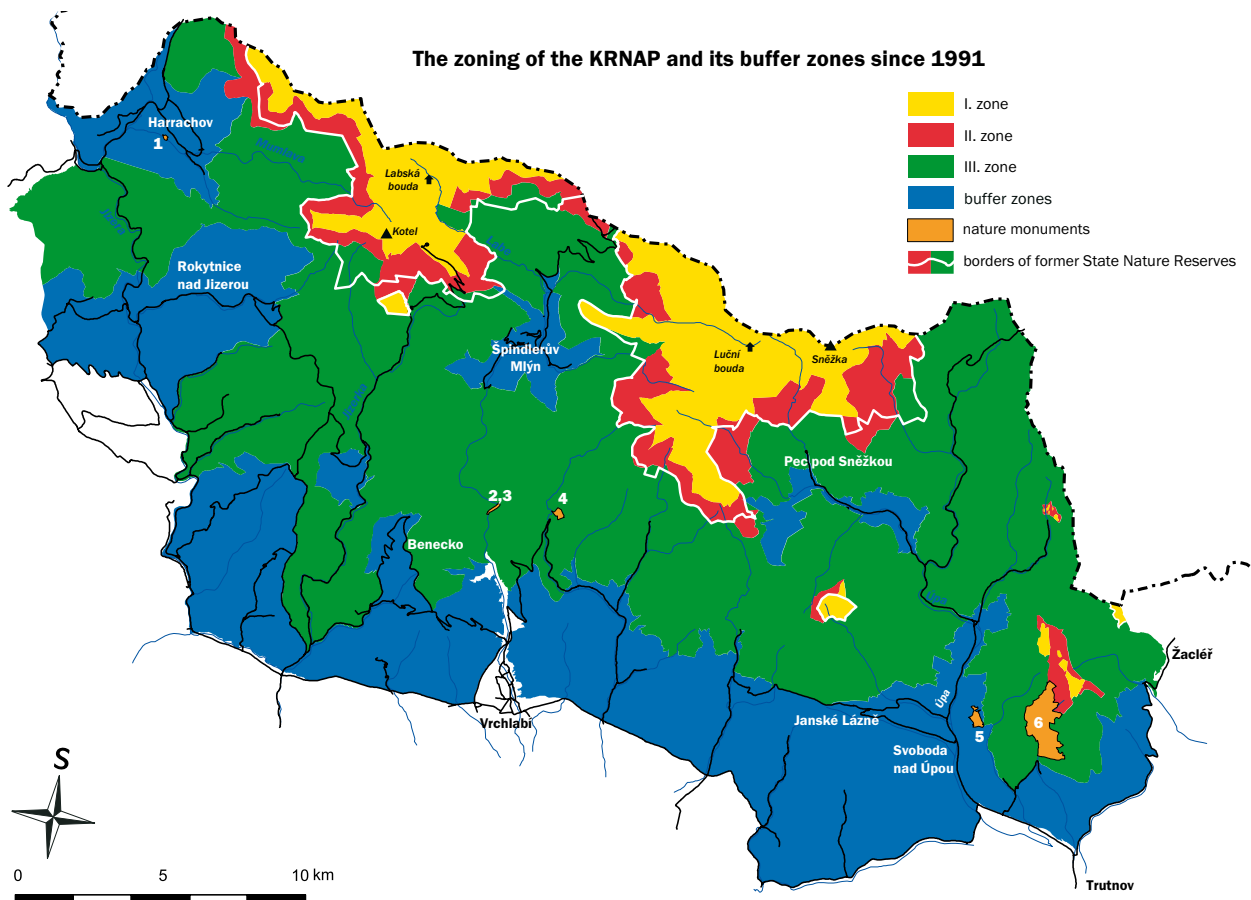
View into the interior of a species-rich Matgrass meadow in the sunshine, with Orange Hawkweed and Rough Hawkbit (July, 2010, photo Kamila Antořová)

Renewal of the National Park and Visions for the Future (1990–2013)

Early in the post-revolution year of 1990 the Administration staff produced an 'Action Programme', which formulated the requirements for changes in the organisation of the care for the park. These were partially fulfilled when the Krkonoše National Park was redeclared on 20th March, 1990 by *Government Regulation No. 165/1991 Coll., establishing the Krkonoše National Park and the conditions for its protection*. This Regulation, along with *Act No. 114/1992 Coll., on Nature and Landscape Protection*, were not only motivated by the needs of humans, but by the natural values themselves. The KRNAP Administration, now a state budget funded organisation, came under the auspices of the new Ministry of the Environment. The inclusion of the previously independent Department of the Chief Architect for the Krkonoše Region into the KRNAP Administration

from 1st June, 1992, transformed it from a professional organisation which provided its opinions in county council planning procedures, into an first level organ of state administration responsible for nature protection (also on the territory of the buffer zone) and forest management, hunting, angling and protection of the agricultural land fund (on the territory of the park itself). This opened up more possibilities to promote the interests of nature protection. In this period of great reorganisation of nature protection, from 1990--1993, Jan Štursa served as the Director of the KRNAP Administration.

The territory of the national park was divided into three zones according to natural values and the level of protection. The First Zone – strictly natural (4,400 ha) – covers relatively undisturbed ecosystems, which should be left to natural processes. The Second Zone – directed natural (4,000 ha) – included the sections which had been somewhat modified, but where near-natural cultivation was a possibility, with the aim of gradually achieving natural conditions in these areas. The Third



The zoning of KRNAP from 1991 reflects the fundamental changes in the categorisation of protected territories according to Act No. 114/1992. The State Nature Reserves (marked with a white line for comparison) were transformed into the KRNAP First and Second Zones, while the other small-scale specially protected areas were also incorporated into the zoning (and formally cancelled in 2009), or automatically transferred to the category of nature monument.

Nature Monuments:

- 1 Anenské údolí, 1985
- 2 Labská soutěska, 1977
- 3 Herlíkovické štoly, 1980
- 4 Lom Strážné, 1998
- 5 Slunečná stráž, 1995
- 6 Sklenářovické údolí, 2009

(map Jana Kalenská and Jiří Bašta, 2013)

Zone (27,900 ha) covers heavily modified ecosystems and inhabited areas. The national park, with a total area of 36,300 ha, is isolated from the influences of human activity in an intensively utilised landscape by a Buffer Zone covering 18,400 ha. The new Buffer Zone included the urban areas of certain municipalities, along with parts of the large ski areas (Harrachov, Vítkovice, Špindlerův Mlýn, Pec pod Sněžkou). The quiet zones were not part of the new regulations (although it must be stated, that their parts which were not also covered by the reservations, respectively the

newly declared First Zone, are areas which do not attract the attention of large numbers of tourists). All of the small-scale specially protected areas were reclassified as nature monuments. The ones which were protected by their inclusion in the First or Second Zones, now only existed formally, and were abolished in 2009.

The new *KRNAP Visitor Regulations*, valid in the years 1993–2010, were prepared according to the aforementioned act and government regulation. They set



The Chairman of the Association of Municipalities in Krkonoše Jan Sobotka, Director of the KRNAP Administration Jan Hřebačka and Deputy Director Jan Kašpar opening a repaired section of the cycle trail to the Vosecká bouda Chalet (June 2010, photo Kamila Antošová).

out the regulations, some of which were new, for visitor movements and for holding sporting events. Mountain biking, which immediately gained mass appeal, was regulated and restricted to a designated network of biking trails. In the following years this network of biking trails was slightly extended. The newest Visitor Regulations, valid from 2010, take into account the need to protect nature in a time of societal changes. They mainly differ from the previous regulations in that they list all the roads on which the use of motor vehicles is now restricted.

The Management Plan for KRNAP and its Buffer Zone became the standard binding document for the activities of the Administration. The first one was valid from 1993, while the second was authorised for the period 2010–2020. The team, consisting predominantly of expert staff from various departments of the Administration, worked for more than two years to prepare the plan. On the basis of massive amounts of data on the development of the KRNAP territory and its buffer zone, as summarised in the analytical section, it specifies the mission of KRNAP, as stated in general in the Act and Regulation: to conserve and improve the natural environment, to

strictly protect wild animals and plants, to maintain the typical appearance of the landscape, to fulfil scientific and educational targets, and the usage of the territory for ecologically sustainable tourism and recreation which is not detrimental to the environment. Commercial and other usage of the national park must be subjugated to maintaining and improving the natural conditions.

The strategic targets include the following:

- Maintaining integrity and connectivity between ecosystems (preventing their further fragmentation),
- Maintaining and supporting species diversity and natural processes in all natural, and selected secondary, ecosystems (e.g. on the montane meadows),
- Reconstruction of the forests towards a near-natural condition, or
- Long-term sustainable development of the Krkonoše municipalities.

After a two-year break, the KRNAP Scientific Council recommenced its work in 1992. Within the meaning of Regulation No 185/1991 Coll., the KRNAP Council was established as an initiative and consultation body with the task of assessing important documents on the



Mountain trails require regular maintenance of their surface and drainage from spring to autumn, if they are not to be washed away. Jan Růžička (on the right) was a trail repairer for the KRNAP Administration for more than 30 years. (2006, photo Jitka Kopáčová)



The KRNAP Administration is involved in many international projects. This photo from 2008 shows the botanists Stanislav Březina, Josef Harčarik and Petra Šťastná gathering data for the GLORIA programme (photo Kamila Antošová)

management and protection of the national park. The Council of the Association of Krkonoše Municipalities became active at around the same time. However, the cooperation between the two councils broke down and the KRNAP Council was dissolved in 1994. The current National Park Council has functioned since 2001. Representatives of the municipalities make up the majority of its 31-member Regional Section, while the 20-member Scientific Section was formed from the earlier KRNAP Scientific Council.

The practical importance of the state border with Poland weakened surprisingly slowly after 1989 (free movement of people without any formalities was only allowed after accession to the Schengen Treaty from 2008), but the cooperation with the Polish national park (KPN) immediately gained in strength after the changes to the political system. In 1990 the KRNAP and KPN Administrations cooperated to prepare for the declaration of the whole of Krkonoše as a biosphere reserve under the UNESCO Man and Biosphere programme (MaB). The Krkonoše/Karkonosze Biosphere Reserve was authorised in the autumn of 1992 and officially declared on 15th February, 1993. It was the first transboundary biosphere reserve in the world and covers the same area as the two national parks. The core zone of the BR, serving to protect biodiversity in minimally disturbed ecosystems, is concurrent with the KRNAP First and Second Zones and the KPN Strict Reservation, while the BR Buffer Zone includes the KRNAP Third Zone and the remainder of KPN and the Transition Zone currently reflects the KRNAP Buffer Zone.

The KRNAP Administration has been a member of the Europarc Federation since 1990. The KRNAP and KPN Administrations were awarded certificates as 'Transboundary Parks – Following Nature's Design' in 2004 as models of excellent cooperation. Cooperation does not only involve standardising rules for the Administrations of both parks, as far as the differing legal systems of the two states will allow, but also includes the joint presentation and use of the results of research work in the field of natural sciences. Since 1991 we have regularly co-hosted the 'Geoeological Problems in Krkonoše' scientific conference, which is held alternately in Poland and the Czech Republic every three years. In addition to natural sciences, forestry and agricultural disciplines, research is also carried out in the fields of tourism, sustainable development and information



Barriers on the former trail between the Labská and Vosecká bouda Chalets prevent erosion caused by trampling the waterlogged terrain and contribute to the stability of the water regime on the Pančavské rašeliniště Peatbog (1995, photo Karel Hník)



In place of the former limestone embankment, an oak-built wooden walkway runs across the revitalized Úpské rašeliniště Peatbog on piles (2009, 13 years after it was built, photo Kamila Antošová).

technology. The work of Czech and Polish researchers is published in the *Opera Corcontica* journal. The first joint research project studied the nesting occurrence of birds (Flousek & Gramsz 1999).

The most valuable parts of nature which are shared by KRNAP and KPN include the arctic peatbogs. Selected peatbogs on the Czech side – especially the Úpské and Pančavské rašeliniště Peatbogs and the Labská louka Meadow – were included on the list of the Ramsar Convention on the Protection of the World's Important Wetlands. In 2009 the peatbogs on the Polish side (especially the Úpské rašeliniště) were added and the Krkonošské mokřady Wetlands became the 11th transboundary territory under the Ramsar Convention. In the mid 1990s the Úpské rašeliniště in the surroundings of the intensively used Schustler Trail was the subject of an expensive revitalisation programme. The limestone embankment, which seriously disturbed the water regime and the chemical composition of the wetland, was replaced by an oak boardwalk built on stilts.

The realisation of the project by the Dutch FACE Foundation (Forest Absorbing Carbon dioxide Emission) began in the autumn of 1992. Representatives of the foundation were directed to Krkonoše by Prof. Josef Fanta, a Czech exile based in the Netherlands. The foundation invested 350 million CZK into the programme to renew the Krkonoše forests destroyed by

emissions, which was used to artificially replant more than 5,200 ha of forests. The project, which was originally planned for 20 years and 16,000 ha, was terminated in 2000. At this time the FACE Foundation received the Minister of the Environment's Award for its work. The most damaged forests were renewed and the further breakdown of forest ecosystems was halted after the closure or desulphurisation of the largest sources of air pollution. The FACE Foundation project became the precursor for further developments in care for forest ecosystems.

On the basis of the Law on the Protection of Nature, the KRNAP Administration gained responsibility for the management of forests on the territory of the national park and its buffer zone on 1st January, 1994. Parts of the three forestry divisions, which were previously included in the Forests of the Czech Republic, state company, were merged with the KRNAP Administration into a single entity. Two years after the merger, the employees of the KRNAP Administration, who were based in a variety of temporary buildings or in the former forestry works, moved into a new building in Dobrovského Street in Vrchlabí. Oldřich Lábek, who had been employed at the Horní Maršov Forestry Works, was named as Director of the expanded Administration. His term of office was ended by a tragic car accident at the end of 1999. In 2000 Jiří Novák was appointed as Director of the Administration, followed by Jan Hřebačka from 2008; both of whom are also foresters.



Educational trail across the Černošské rašeliniště Peatbog (photo Kamila Antošová)

The unification of the forestry and nature protection activities was not only an organisational change, but was primarily a fundamental turnaround from the separate promotion of a variety of forestry and nature protection targets, which had developed a confrontational character in the past, towards joint care for the montane nature. The typical technical forester's ideology that perceived forests as sources of timber shifted to the concept of forests as ecosystems. With the support of the FACE Foundation, the reconstruction of the monocultures into forests with a varied representation of tree species began and the foresters' attentions turned to the natural species composition of the forests. In addition to the support for Beech and the difficult task of re-dispersing Firs, the reconstruction also supported trees which had been suppressed as unproductive species until 1989 (e. g. Silver Birch and Rowan), but which play an irreplaceable role in the life cycle of the forest. The renewal of the forests was supported by the reduction of the Red Deer population. Heavy machinery was replaced by lighter equipment, which reduces damage to the forest soils. Botanical localities, in which special measures were necessary during improvement felling or harvesting, were delineated. Clearcutting



As part of its controls on the renewal of the forest growths, the FACE Foundation had the Krkonoše forests photographed from a helicopter. This picture from 1995 is of the south-western slopes of Mt. Čertova hora (photo Karel Hník)



Planting spruces on the manipulation area at Dívčí lávky, 1997 (photo Karel Hník)



Spruce seedling, known as a plug, grown in the Netherlands, planted in the standing dead forest (1997, photo Karel Hník)

was forbidden and precedence was given to the more demanding selection system, which can help in the transformation of the closed and monotonous same-age stands, into age- and spatially-diverse open stands with natural regeneration. After the sulphur emissions crisis faded, the forests regained their natural regeneration capability, which is now preferred in all areas where it is not necessary to introduce new tree species to the stands. Planting with several thousand saplings per hectare was replaced by hundreds of thousands of seedlings per hectare from natural rejuvenation. A certain percentage of the wood mass was left to rot in the forests. All of these measures are carried out on the basis of scientific research, which has been published in many studies and journals. In 2009 the KRNAP Administration was awarded the FSC Certificate for its ecological forestry management, which also confirms the correctness of the decision to definitively ban chemical interventions in the Krkonoše forests. After the emission calamity, primarily caused by sulphur compounds, came to an end, attention is now focussed on the increased nitrogen deposition, the sources of which are primarily transport and domestic heating.

The activities of the FACE Foundation and further long-term efforts by the foresters have been followed by the 'Stabilisation of Important Forest Ecosystems' project. This project is realised in the years 2010–13 in more than 6,800 ha of forests all over the national park and at an expense of more than 88 million CZK, with the target of improving the age- and species-diversity in the same-age spruce monocultures, which were planted on the emission clearcuts from the 1980s onwards. Meanwhile, the water regime is also being renewed in formerly wet forests, which had been drained since the 19th century, and to maintain suitable conditions for the Black Grouse population.

Great changes may also be seen in the management of forest-free ecosystems. Protection practices are continually developed according to the results of scientific research. Even though the development of human knowledge is continual, we can identify certain milestones – at the beginning of the new millennium in Krkonoše these were the following publications, in which the collectives of authors described the phenomenon of the Krkonoše arctic-alpine tundra. In this way, the phenomena in the First Zone of KRNAP were placed into wider geographical, climatological, geological, geomorphological, pedomorphological, zoological and botanical contexts, including the issue of the dwarf



Jan Hřebačka, who was the project leader and coordinator for the FACE project in the year 2000, is telling the editor of the Krkonoše magazine Jiří Dvořák about the experience of using individual plastic protectors for deciduous trees. A whole range of individual protection was used at different times and for different tree species, including stiff wire cages (photo Karel Hník)



Underplanting with deciduous trees in the rejuvenating spruce forest (photo Kamila Antošová)



Jan Hřebačka, Minister of the Environment Martin Bursík and Prof. Josef Fanta discussing the results of the FACE Project in a showcase forest section above Dolní Dvůr fifteen years after the project started (2007, photo Kamila Antošová)



The natural rejuvenation of beeches now reaches hundreds of thousands of seedlings per hectare at some localities. The times when these trees were weakened by air pollution and pest infestations and hardly produced any seeds is now forgotten (photo Kamila Antošová)



Beeches form the lower layer in the mature spruce stands (photo Kamila Antošová)



Oldřich Lábek led the KRNAP Administration from 1994–1999 (photo Karel Hník)



Jiří Novák, Director of the KRNAP Administration from 2000–2007 (photo Karel Hník)

pine scrub (Lenka Soukupová, Milena Kociánová, Jan Jeník and Josef Sekyra, eds., 1995. Arctic-Alpine Tundra in Krkonoše, in the Sudetes. *Opera Corcontica* 32). – Also, the summary of Krkonoše meadows in general and in detail from the phytocenological and vegetation perspectives (František Krahulec, Jan Štursa, Sylvie Pecháčková, Emilie Balátová-Tuláčková, Martina Fabšičová, Denisa Blažková 1996. Meadows in Krkonoše – Plant communities and their dynamics. *Opera Corcontica* 32) – Avalanche cadastre – complex data on avalanches from the years 1961–1998 (Valerian Spusta and Milena Kociánová, *Opera Corcontica* 35), later supplemented with newer data.

Whereas cultivation of the forests had always continued, the valuable communities on the Krkonoše meadows were endangered by the practical end of mountain farming. This was influenced by the privatisation of agricultural land, which state agricultural companies were obliged to transfer into the Land Fund of the Czech Republic, and which ended the possibility of issuing fines for not cutting the hay (*Act No. 334/1992 Coll., on the Protection of Agricultural Land*, does not impose fines on cultivated lands). The meadows which were left fallow after 1989 now shared the fate of meadows which were left to become overgrown or which were reforested in the period after World War II. This primarily concerns the fringes of the mountain villages or the more remote enclaves, waterlogged or steeply-sloping meadows or

those which are inaccessible for technology. Further neglected plots are moving towards the same condition, even though the possibility of fines has been replaced by more favourable subsidy policies. At lower elevations, the transformation, division, privatisation or restitution of the property of the state farms was followed by a growth in private farming, subsidised by the Ministry of Agriculture. In the montane belt the KRNAP Administration carries out long-term active management of the most valuable meadows in cooperation with the owners of livestock, predominantly sheep, but also including cattle, horses and goats. Examples include the belt of enclaves from the Lahrový Boudy Chalets to the Klínové Boudy Chalets and the abandoned village of Sklenářovice, the valley of which was declared a Nature Monument in 1995. Grazing is also utilised in the Modrý Důl Monument Zone, while opportunistic trees were removed from meadows in the Velké Típetovské Boudy Monument Zone. A variety of interventions take place every year – pruning woody plants, hay cutting, harrowing, with rare species even treated at the level of individual plants – at dozens of smaller localities. These demanding activities are financed from the Landscape Care Programme, Support for the Renewal of the Natural Function of the Landscape Programme and other public funding. The KRNAP Administration uses funds from the Landscape Care Programme to pay contributions to the owners or leaseholders of smaller meadows for maintaining them. Many owners



Excursion after presenting the FSC certificates to the KRNP Administration on 1st July, 2009. The Director of the Forest Administration Zdeněk Čermák is explaining something to Martin Bursík, Jan Hřebačka and the Minister of the Environment at the time Ladislav Miko (photo Kamila Antošová)



Forestry patrol in central Krkonoše, 1996. In the centre Oldřich Lábek is listening and Jiří Novák is speaking (photo Karel Hník)



Sluices on the centuries-old land drainage system should renew the original water regime in the damp forests. (photo Kamila Antošová)



One of the few long-term traditional farms in the mountains – the Sosna Mountain Farm at Vlašské Boudy (1998, photo Karel Hník)



The small herd of Scottish Highland Cattle helped the KRNAP Administration to maintain the meadows at Rýchory. At present this breed is kept by farmers at Janova Hora and at the Sagasserovy Boudy Chalets. This photo from Rýchory is from 2000 (photo Karel Hník)

of recreational properties, who would not otherwise cultivate their land, are among the recipients of these subsidies. The disadvantage of just cutting the hay is, that the soil is depleted, but there is hope of a renaissance of keeping small livestock herds, especially at some of the permanently inhabited chalets.

In areas above the upper tree-line the grazing and hay-making, which was practiced until 1945, has never been renewed. Here the KRNAP Administration is dealing with other serious problems: relationships in herb communities, glacial soil forms and the recently planted dwarf pine scrub. The project of high-mountain afforestation with pine scrub was terminated in 1990 and several scientific studies were carried out in the following two decades to evaluate the influence of these plantings on the environment of the arctic-alpine tundra. After many emotive discussions and practical trials, the first stage of reducing the dwarf pine scrub on the Labská louka Meadow was realised in 2010 – the most extensive management intervention in this area since the park was founded. The condition of the tundra communities is most endangered by tourist activity. Therefore, an integral part of their care is the reconstruction and maintenance of tourist trails. The first to be repaired was the completely destroyed trail from Mt. Růžová hora to Mt. Sněžka in 1995. Since then nearly all sections of the main tourist trails have gradually been reconstructed, using the traditional technique of ‘stone pitching’ wherever possible. The basal rock gravel, which negatively influenced the surrounding plant communities, had to be removed from trails and replaced with more

suitable material. This material did not only have to be removed from the trail bed itself, but also from the surroundings, where this foreign material had spread to in the years of neglect.

The abandoned meadows, which were formerly grazed and fertilised, plots below the cottages and chalets and the trails where limestone and melaphyre were used, have one thing in common: they serve as focal points for the spread of invasive and expansive plants. The best known and most problematic of these is the Monk’s Rhubarb, introduced here by immigrants from Austria five centuries ago. Monk’s Rhubarb is able to occupy many hectares of uncultivated meadows and grasslands, onto which waste water is released. It is the only plant species against which large amounts of herbicides were used from the 1990s. It was successfully eradicated in some areas, on which meadow communities were renewed. The Monk’s Rhubarb was radically suppressed on the edges of the tourist trails and along streams, but thanks to its incredible reproductive capability and the supply of seeds in the soil, this battle to eradicate it will take much longer and will require the cooperation of farmers and land-owners. Smaller chemical interventions were also used against the Giant Hogweed, Marsh Lupine and Knotweeds. The spread of Yellow Ox-eye is a potential threat and Himalayan Balsam occurs in the buffer zone. The Creeping Thistle has spread along the trails up to the Sub-Alpine zone, while Ragwort is spreading expansively in some areas (these plants are successfully controlled by mechanical removal). Only one non-native tree, the Green Alder, causes concern for



The vantage point by the Pančava Waterfall not only improves the view, but also clearly prevents the public from leaving the marked trail. Down in the Labský důl Glacial Valley we can see that the clearcuts below the Lavina logging road are already growing over (2011, photo Kamila Antošová)



Reconstructed trail on the Obří hřeben Ridge (2010, photo Kamila Antošová)



The trail to Mt. Harrachovy kameny is relatively narrow and paved with granite blocks. It replaced a wider, gravel trail (2011, photo Kamila Antošová)



Grouse breeding station by the Sokolka Chalet at Rýchory. The enclosures were designed to reduce the predation of the breeding grouse by pine martens (1991, photo Karel Hník)



The long-time Grouse breeder Gustav Hofmann with one of his charges in 1993 (photo Karel Hník)

the foresters in Krkonoše. The long-term control of the biological invasion is to be followed by an extensive project for the liquidation of invasive and expansive plant species, the realisation of which has yet to begin due to administrative difficulties – as the property of thousands of landowners is affected.

Much energy is also dedicated to the opposite problem: the rescue of rare species which are in decline in Krkonoše. The KRNAP Administration operates a gene fund garden, where plants are grown ex situ as reserve stock. A seed bank, in which the seeds are kept at low temperatures, has been established recently. In addition to the planned management of the localities of endangered species, we also preserved the possibility of reintroduction, or strengthening, the original population by planting or sowing seeds. The rescue breeding of Capercaillie at Rýchory was terminated after the unsuccessful reintroduction of birds brought here from abroad; the conditions for this species in Krkonoše are not suitable anymore.

Following the privatisation, restitution and following sale of property after 1990, the character of the demand for new construction changed. Instead of the large socialist organisations (Revolutionary Trade Union Movement, Czechoslovak Sports Organisation, Interhotel Krkonoše) and companies building their recreation centres, the new developments were mainly the initiatives of a large number of smaller investors, with the cumulative effect that they were much more demanding in their use of space – not building individual, large-scale projects of the hotel type, but dozens and hundreds of guest houses and hotels. The larger investors are now represented by the property

development groups, which offer fashionable recreational living in apartment complexes. Hundreds of apartments (not including the complex at Horní Míšečky, where the town planning regulatory mechanisms totally failed) were built during the economic boom before 2008 in the buffer zone, primarily within the built up areas of the large resorts. Their influence on the local communities and architecture is devastating, comparable only with the never-ending construction along Mediterranean coastlines. Recently we have been witnesses to a consolidation of the skiing business, with mergers of the ski slope operating companies. The basic infrastructure in all of the ski areas was built in previous decades. Before 2000 they were greatly modernised and then linked together in the following decade. Topical discussions now concern the influence of artificial lighting of ski slopes in the evenings on the surrounding landscape and the influence of extracting water for artificial snow making from the streams. The pressure to develop the infrastructure needed for downhill skiing was addressed by an expert group in 2008. In their final report they stated that, it is only possible to supplement the existing ski slopes on the territory of KRNAP, and only outside of the 2nd and 3rd zones. Plans to develop downhill skiing resorts are subject to SEA/EIA assessments (*Act No. 100/2001 Coll., the Assessment of Environmental Impact*) and assessment of the influences on Natura 2000 localities (§ 45h and 45i of *Act. No. 114/1992 Coll., on Nature and Landscape Protection*).

The Natura 2000 network is now the strongest tool in the evaluation of plans for individual construction. The passing of *Government Regulation No. 600/1994*

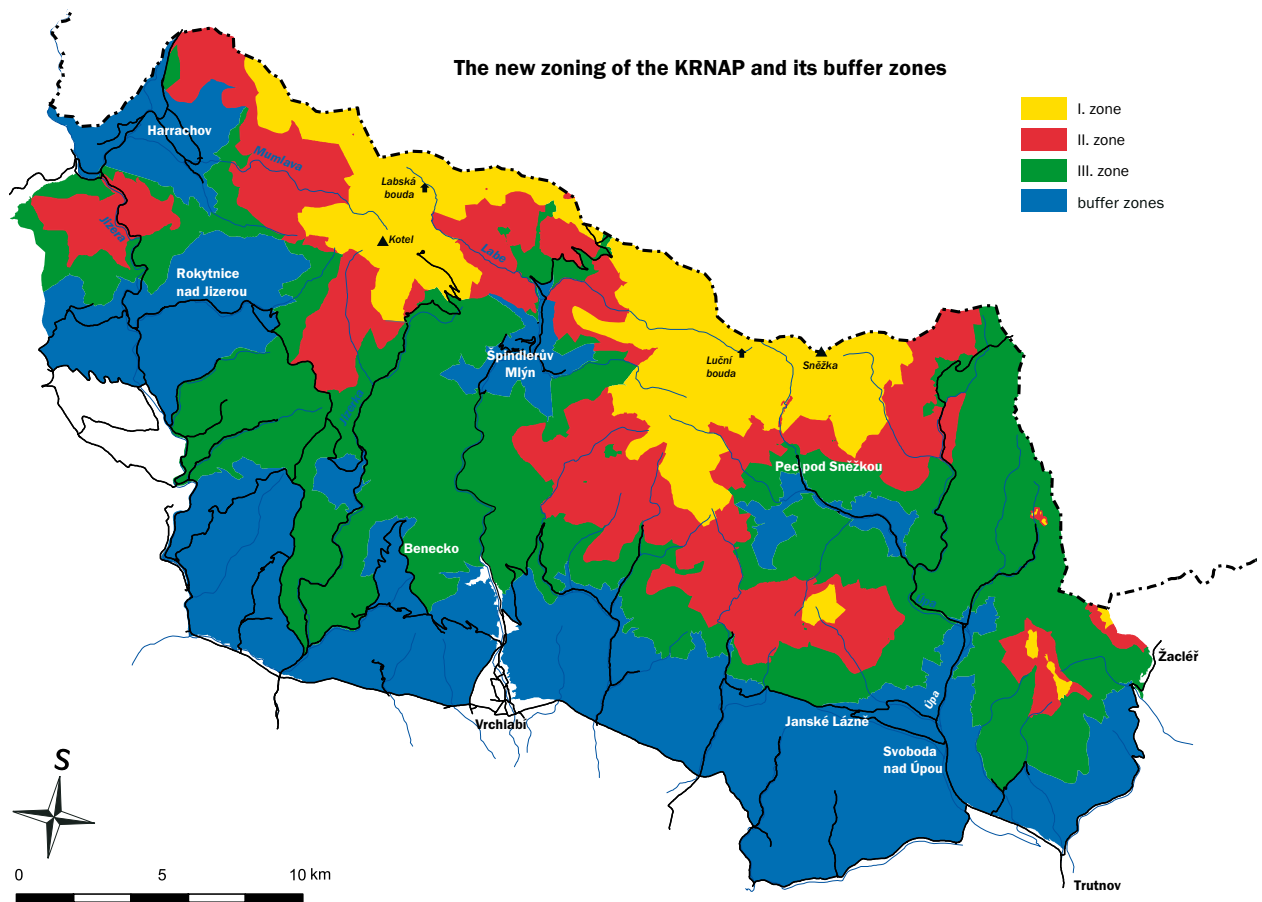
Coll. defining the Krkonoše Mountains Bird Area, and Government Regulation No. 132/2005 Coll. establishing a National List of Sites of Community Importance, mean that the territory of KRNAP and its buffer zone have become integral parts of the European network of protected areas. At the same time, we published the 'Evaluation of the Landscape Character in the Krkonoše National Park and its buffer zone' (Brychtová and Krause 2005) as a practical manual for the activities, not only by the KRNAP Administration, but also by the local municipalities, planners or architects.

Prevention of problems is better than solving them. This is why the KRNAP Administration carries out long-term educational, and enlightenment activities. We still run the Museum of Krkonoše network – in the Monastery building in Vrchlabí, in the Chateau and the Manorial Brewery in Jilemnice and in the Friary in Paseky nad Jizerou. The small Vápenka Museum in Horní Albeřice, opened in 2012, was designed, built and is operated for the Administration by the Veselý výlet Horní Maršov organisation. Information centres are operated in Vrchlabí, Harrachov, Špindlerův Mlýn and Pec pod Sněžkou. The Administration also operates several seasonal field information posts – the first was operated at the Dívčí lávky Bridge from 1994, gradually increasing to twelve – but for financial reasons the number has fallen again since 2009. The financial situation also led to the closure of the information centre in Rokytnice nad Jizerou and even the Krkonoše Centre for Ecological Education at the Rýchorská bouda Chalet. After more than thirty years as the operator, the KRNAP Administration is negotiating the transfer of the Jilemnice Museum back to the town. Educational activities have been strengthened in Vrchlabí, where the small Young Environmentalists' Centre, which burnt down in 2008, will be replaced from 2013 by the generously designed Krkonoše Environmental Education Centre.

The financial operations of the KRNAP Administration have changed greatly over the last twenty years. Financial resources from the Ministry contribution and our own commercial activities only make up

part of our budget. As a result of public spending cuts, the number of employees of the Administration has fallen by a half (250 employees in 2013). The Administration now finances demanding activities, such as major investment programmes or long-term scientific projects, from various European and national programmes and funds, with smaller actions also funded from regional grant programmes. In addition to the previously mentioned activities, we must also mention the completed reconstruction of the Monastery gardens, the prepared renovation and new exposition in the Museum of Krkonoše in Vrchlabí, the exposition on skiing in the Museum of Krkonoše in the Manorial Brewery in Jilemnice, which was completed in 2010 (subsidy from the Norwegian Funds; in cooperation with the town of Jilemnice) and the start of the LIFE+ project in 2013, which is focussed on the support for long-term sustainable care for localities in the Natura 2000 network. Transboundary cooperation includes the successful museum project entitled 'Via fabrilis' or the Way of Craft Traditions, or cooperation in the field of geographical information systems in the Inspire programme. Contacts with KPN are strengthened by the long-term project entitled Joint Education for the Staff of KRNAP and KPN, with staff exchanges to allow staff to experience aspects of the work on the other side of the mountains, which they would not receive during their everyday work of caring for their own park territory.

Our description of our everyday work to protect the territory cannot possibly cover everything and the reality is much more varied, which interested parties may read about in detail from the periodicals and publications, a selection of which are added to this text. We will conclude this summary of half a century of Krkonoše National Park with a view into the future. After years of preparations and negotiations with local communities, the new zoning system will become valid in 2013. The Ministry of the Environment has already approved the new zoning, which is more reflective of the condition of the environment, and which the KRNAP Administration is trying to protect and improve.



The new zoning approved in 2012 better reflects the need to protect the preserved parts of nature. The newly delineated First Zone is extended to include the former Second Zone (compare with Map 3) and approximately reflects the former reserves. For the purposes of clarity, Nature Monuments are not shown, as their number in 2013 is the same as on Map 3. (map Jana Kalenská, 2013)



Installing the Terrain Service cabin at Dívčí lávky in October, 1994. In summer the cabin was to serve as an information point, in winter as a shelter for cross country skiers on the Keep Fit! Trail. Around the cabin are panels with educational texts, on the right the preserved roots around a spruce stump (photo Karel Hník)



International Youth Work Camp, June, 1995. The participants reconstructed the drainage along the Weber Trail between the Luční bouda Chalet and Kozí hřbety Ridges (photo Karel Hník)



The renewal and establishment of spawning pools for amphibians endangered by civilisation is also a suitable model for work in environmental education (photo Kamila Antořová)



Children and young people on work parties in KRNP soon realise how much work the maintenance of natural riches involves. Here they are removing old growth in the First and Second Zones, in the xerothermic surroundings of the Albeřice Quarries (photo Kamila Antořová)



Zoologist Jan Vaněk lectures to children by the Rýchorská bouda Chalet (1996, photo Karel Hník)



As part of the 'Safety in Krkonoše' programme – a member of the Krkonoše Mountain Rescue Service is teaching KRNP Administration employees how to work with avalanche poles (photo Kamila Antořová)



Hundreds of pieces of visitor infrastructure are installed in the park to ensure the safety, comfort and education of visitors (2009, photo Kamila Antořová)



Orchard with ancient fruit tree varieties in the monastery gardens in Vrchlabí (2010, photo Kamila Antošová)



Selected wide trails with gentle gradients which were built for the needs of mass tourism may also be used by people with disabilities and their assistants. The KRNAP Administration has a long involvement in the 'Krkonoše without Barriers' project. In this photo from July, 2009 Michal Skalka is accompanying a handicapped group to the Labe Spring (photo Kamila Antošová)



Field training for KRNAP and KPN staff, botanical stop in the Mały Śnieżny Kocioł Cirque, June 2012 (photo Kamila Antošová)



The departments of the KRNAP Administration in Vrchlabí were based in the chateau, the museum building and in two temporary wooden buildings for many years. A new headquarters was built after the merger with the forestry works (completed in 1996, photo Kamila Antošová)



The territories of KRNAP and KPN, resp. the Krkonoše/ Karkonosze Biosphere Reserve, also include Sites of Community Importance and the Krkonoše SPA-Bird Area as parts of the Natura 2000 network, which cover relatively wild areas of the sub-alpine and alpine vegetation belts, as well as a mosaic of meadows and pastures in the forests at the montane level. This photo of Benecko with Mt. Kotel in the background was taken in 2008 (photo Kamila Antošová)



The cycling Peace Race at its finish line at the Vrbatova bouda Chalet, May, 1995. Mass sporting events have gradually been moved away from the ridges (photo Karel Hník)



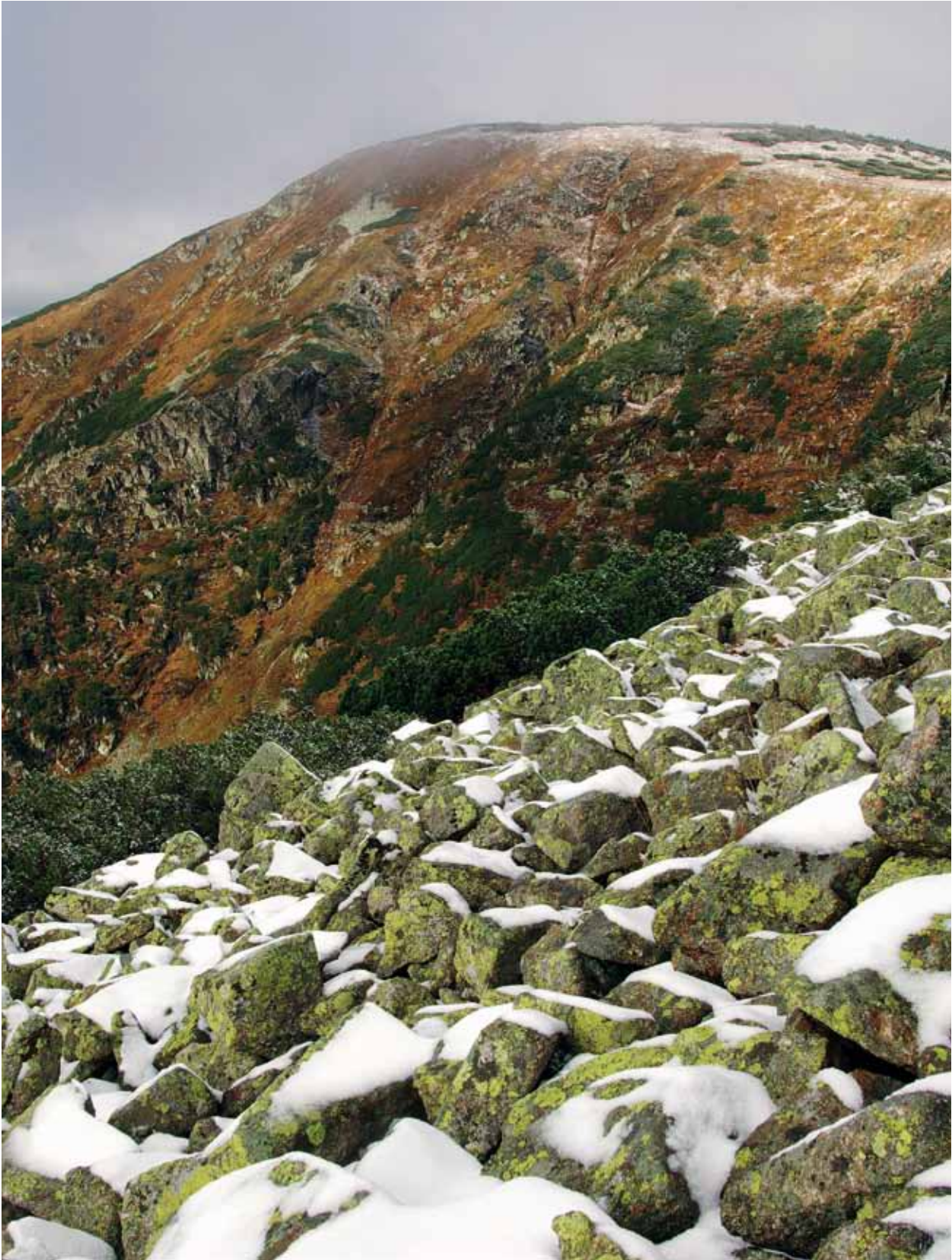
The participants in the excursion from the IUCN international conference National Parks – Emissions and Man in June, 1990 in the Labský důl Glacial Valley were shown that not even the state nature reserves were spared from the clearcut method of liquidating the air pollution calamity (photo Karel Hník)



Trip to make regular measurements of the snow conditions in the Schustlerova zahrádka in the Labský důl Glacial Valley. This photo from 2006 shows Ranger Petr Hartman and the Editor-in Chief of K+JH magazine Radovan Vlček accompanying Petra Šťastná, who took over the measuring from Jan Štursa (photo Kamila Antošová)



Border marker above Mt. Vysoká pláň, Mt. Kotel in the background (photo Kamila Antošová)



An autumnal view from below the former Jestřábí Boudy into the Kotelní jáma Cirque (photo Kamila Antošová)

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- opera.krnapp.cz** – contains all issues of the *Opera Corcontica* journal in PDF format
- gis.krnapp.cz** – map server
- architektura.krnapp.cz** – electronic form of the *Typická architektura Krkonoš a Jizerských hor* guide
- invazky.krnapp.cz** – information on invasive plants in KRMAP and the fight against them.

Great Krkonoše Cases

Jan Štursa

In 2013 half a century has passed since the moment when our first national park was established. Half a century, in which a multitude of events, both pleasant and terrible, have left their marks on the face of our highest mountains. The initial search for the correct path which the national park should follow, was replaced by a sad and unpleasant period, during which the surface of the Krkonoše Mountains was relentlessly showered with toxic pollutants, the forests withered and died, a variety of living things disappeared from the mountains, all of which was not helped by the massive boom in recreation and tourism under the then fashionable slogan of “the mountains belong to the workers”. Then, in 1989, bunches of keys rang out on the town squares below the mountains and began the search for better ways to cure our highest mountains of their ills and to secure their future. It was not at all easy to achieve, so more and more tumultuous events, which moved the whole of society, were added to the chronicles of the national park. It would be a shame if the passing of time drowned out the fates of the new generation of protectors, inhabitants and users of our constantly beautiful mountains. After all, history, if it is preserved, is an indispensable treasure chest of experience for the future. This is the main reason why we intend to commemorate the great events of the previous decades, which circumstances and what kind of people have influenced the modern history of the Krkonoše Mountains National Park.



The hygrophilous Western Marsh Orchid is commonly found in the Krkonoše wetlands, but is less common in the foothills (photo Kamila Antošová)

01

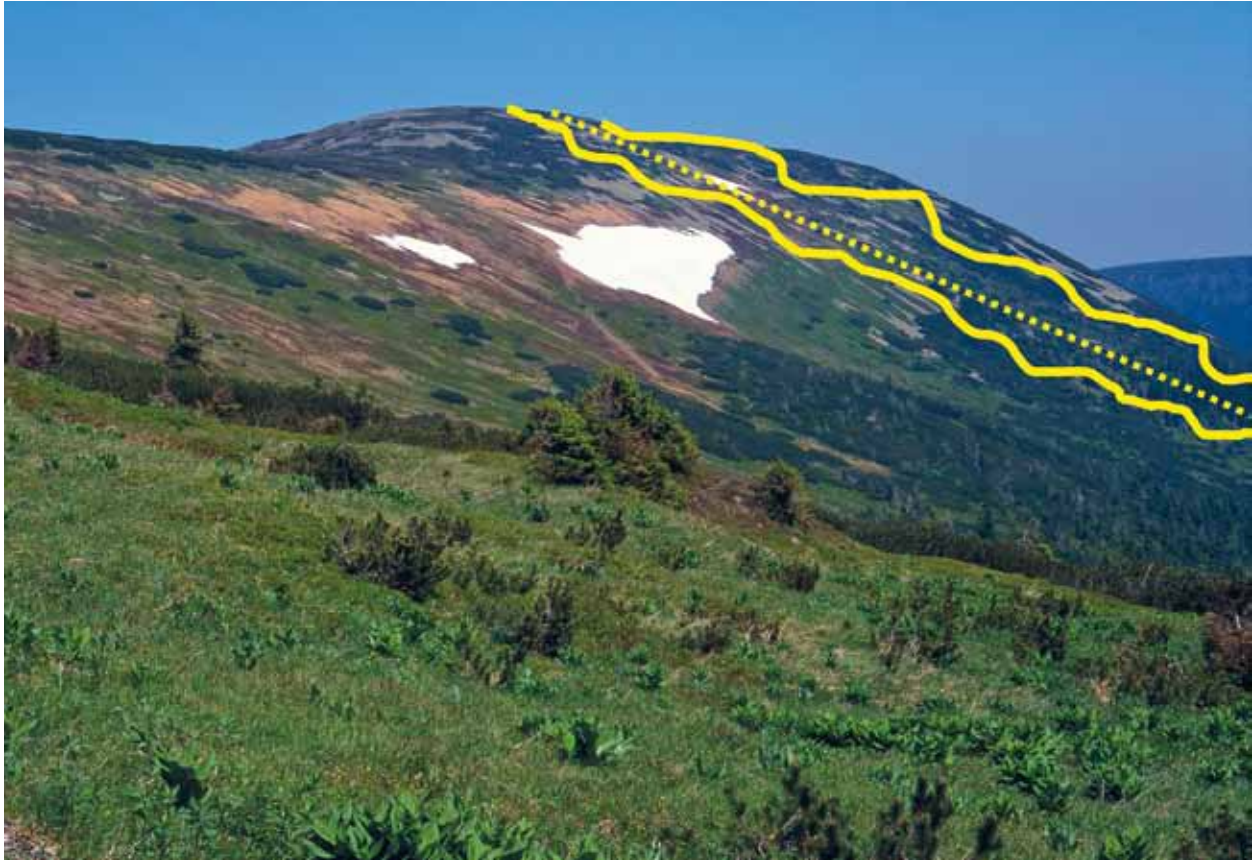
Modrý důl Valley

**Victory for expert
arguments, or
economic reality?**

The massif of Mt. Studniční hora, the third highest peak in the Krkonoše Mountains, has attracted human attention since time immemorial. The best known Medieval mining site in Krkonoše developed on its eastern slopes in the Obří důl Glacial Valley, the slopes of Mt. Studniční hora were made famous by the mysterious Čertova and Krakonošova zahrádka (Devil's and Krakonoš's Back Garden), to which the expedition trails of Krkonoše herbalists, and later Krkonoše researchers led, the southern slopes were settled by mountain chalet farmers in the late 17th century, and cattle were grazed and hay collected from the meadows at both enclaves in the Modrý důl Glacial Valley. The southern slopes of Mt. Studniční hora glisten long into summer-time from the surface of the largest Krkonoše firn bed – 'The Map of the Republic', in the last century the route of the very popular and prestigious skiing event – the 'May Race' (later known as the 'Liberation Race') ran through the ravine of the Lavinový potok Stream in the Úpská jáma Cirque. Simply, it's a mountain with everything, so it is no surprise that people of different interests and professions tried to conquer it many times over. To extract mineral resources from her womb, to understand the cause of the natural wealth of the Krkonoše 'gardens' – or to use the snow conditions on its slopes for tourism and sports.

A Fabulous Ski Area

In 1966, the Central Committee of the Czechoslovak Union of Physical Education (CC CSTV) presented plans to build a downhill ski area with all the amenities required to achieve the valid parameters for hosting international competitions. The plans were based upon the



The proposed downhill ski slope and cable car connection between the Modrý důl Glacial Valley and the summit of Mt. Studniční hora. Luckily for this unique island of Krkonoše tundra, the project was not realised (photo Jan Štursa)

assumption that the great elevation (from 900 to 1,554 m above sea level) and steep slope gradient of Mt. Studniční hora would be reflected in the required height and long duration of snow cover. The applicants cited that the big snow and firn beds on the Studniční hora slopes also persist until early summer in places, and perhaps their own personal experiences, as confirmation. Indeed, on the Polish side of Krkonoše there were already at that time, and still are, very popular bizarre downhill rides in some of the gullies in the Mały Staw Cirque, and the very popular 'May Race' was always held at the beginning of May in the Úpská jáma Cirque until the 1960s.

The investment study from July, 1966 for the proposed ski area on Mt. Studniční hora and in the Modrý and Obří důl Glacial Valleys included the construction of several racing, sporting and tourist ski runs, a chair lift from Modrý důl to Studniční hora, another to Mt. Luční hora, and later a hostel and a mountain hotel in the Modrý důl Glacial Valley and a ski stadium

with spectator stands in the Obří důl Glacial Valley. The valid Land Use Plan for Pec pod Sněžkou at that time even proposed building a ski jumping stadium, a mountain hotel in the Obří důl Valley and accommodation (50 beds) at the upper stations of the chairlifts to Studniční hora and Luční hora. The estimated capital cost of implementing the CC CSTV plans amounted to almost 35 million CZK, a huge sum of money in the economic conditions at that time.

However, the proposers of this 'grand' plan completely ignored the fact that everything should be placed on the territory of a national nature reserve with strict protection status (the former Obří důl and Východokrkonoská State Nature Reserves), as well as failing to respect the extreme climatic conditions on the summits of the Krkonoše mountain tundra (avalanche danger, rapid changes in temperature, wind and visibility, spatial and temporal variability of snow cover).

From the long-term snow monitoring, historical reports, the distribution of forest stands, which are



Under the leadership of Prof. Bohuslav Sýkora, a member and later the President of the KRNAP Administration's Scientific Council, one of many methodological field discussions on the long-term monitoring of the natural conditions on the Mt. Studniční hora massif (from the left: F. Kolín, Z. Rozsypalová, B. Sýkora, V. Spusta, ?, ?, E. Hadač, O. Štětka, M. Klapka, Z. Říha, ?, V. Veselý; photo Jan Štursa)



The upper slopes of Mt. Studniční hora are characterised by strong wind flows, which continually change the character of the snow cover. The bizarre shapes of sculptured snow delight the photographer, but they represent the danger of crashing or injuries to skiers (photo Jiří Havel)

so typical for avalanche paths and channels, it is clear how common and destructive avalanches are at the head of the Modrý důl Valley. The destructive consequences of the largest avalanches are even visible on the opposite slopes of the Široký hřbet Ridge. The cross by the winter trail through the Studniční Boudy treeless enclave, which reminds us of an avalanche which ran down the slope on 20th February, 1952, burying and killing the experienced skier Štěpán Šilhavý, should also serve as a warning to reckless skiers. The staff of the Krkonoše Mountain Rescue Service know all about the hazards of winter traverses at the head of the Modrý důl Valley, as they regularly close the Modrý důl area during the long winter months, or do not recommend that tourists ski in this area. Indeed, even during average winter snow conditions, snow drifts over 15 m high accumulate in the avalanche fracture zone at the snowbed known as the 'Map of the Republic'!

The study lacked any solid long-term evaluation of these particular weather and snow conditions, which caused much controversy from the beginning, and consequently clashes of interest between representatives of nature conservation and CC CSTV officials. The other side probably really imagined that they have the 'Giant Mountains' (one of many interpretations of the original German name Riesengebirge) all to themselves, and put all their efforts into implementing whatever they could in the intimate surroundings of the Krkonoše Mountains. So this unleashed one of the biggest disputes in the still young history of the Krkonoše National Park. The climate for finding objective solutions at that time was not supportive of the protection of the nature and landscape in Krkonoše. Nevertheless, after many negotiations, and especially thanks to the courage of several representatives of the KRNAP Administration Scientific Council (Prof. Bohuslav Sýkora, Prof. Emil Hadač, Ing. Josef Fanta), we managed to convince the political leaders, that the

Average number of days in the winter season	Average number of dangerous days	Average number of dangerous days for skiing usage		
		unsuitable	suitable	very suitable
151 100 %	96 64 %	40 26 %	15 10 %	0 0 %



Remarkable growth form of Norway Spruce (*Picea excelsa*) – known as Spruce Krummholz. In the whole of Krkonoše it only occurs on the extremely windy slopes of Mt. Studniční hora and Mt. Sněžka (photo Jan Štursa)

necessary first step would be to carry out a detailed research study over several years. This study was to provide the information needed to solve the dispute and allow an objective final decision to be made. The Director of the KRNAP Administration Miroslav Klapka was lucky that he could rely on excellent teams of experts from the Scientific Council and numerous professional institutions in the application of nature protection in Krkonoše.

Monitoring

Detailed monitoring of the climatic conditions on the southern slopes of Mt. Studniční hora, supplemented by a detailed analysis of all geomorphological and botanical phenomena which occur there, was carried out during the winters of 1968–1970. Every day, and in all weather conditions, KRNAP rangers hiked to the 12 permanent observation points in order to record



Least Primrose (*Primula minima*) is one of the botanical jewels in the flora of the Krkonoše tundra (photo Jan Štursa)

all meteorological characteristics, height and quality of snow cover, but also safety parameters – visibility, avalanche danger, navigability of the slopes and more. Four years later they had managed to collect 22,000 items of data, the comprehensive analysis of which brought fundamental knowledge for further decision-making. From the table it is clear exactly what conditions prevail on the southern slopes of Mt. Studniční hora in relation to their possible use for skiing.

Only 15 days in an average winter season in positions above 1,300 m on the southern slopes of Mt. Studniční hora would allow regular skiing usage. Such a low number of days is due to:

- insufficient height, quality and duration of snow cover,
- very limited to poor visibility,
- adverse wind conditions,
- frequent avalanche danger close to the 'Map of the Republic' and at the head of the Modrý důl Glacial Valley.

The reduction of all of these risks would require very challenging logistical support (e.g. artificial snowmaking, avalanche barriers, removal of the pine and spruce scrub growths, permanent monitoring of the avalanche threat, safety supervision). Along with the crude interventions during the construction works (felling forest stands, treatment of the ski slope surfaces, linear and associated structures), the proposals would lead to irreversible damage to the most valuable parts of the Krkonoše National Park, an undesirable deterioration of hydrological conditions and subsequent soil erosion (detailed results were published in the Journal *Opera Corcontica* No. 10 in 1973).

Several years of investigations confirmed that the proposed area was not suitable for intensive skiing usage, and that the proposed investments were unlikely to be profitable, regardless of the irreversible interference with the natural conditions.

One could expect that such strong arguments could not be simply swept under the carpet, and that communist autocrats would not dare to risk the loss of credibility of their decision-making. So what followed was what the employees of the KRNAP Administration, naturalists and all admirers of the natural beauty of Krkonoše had eagerly anticipated. After the study was completed, the implementation of the CC CSTV proposals was officially abandoned. It was also recommended that development planning in the Krkonoše Mountains in the future should always be strictly based on systematic research and analysis of all natural conditions in the affected parts of Krkonoše National Park. Such a procedure actually foresaw the future introduction of the evaluation process on the impact of construction on the environment (EIA – Environmental Impact Assessment).

However, reports on the Modrý důl case emerged from behind the scenes, that although the field research and the application of its results was a great victory for nature conservation in Krkonoše, if it had not been for the significant lack of the capital needed to implement the ski area proposals, then the situation in the Modrý důl Glacial Valley probably would not have developed so favourably. Who knows what really happened behind the scenes in the party organs? Maybe it was the fear of avalanches after all, not of snow, but flows of ideas and arguments. Unfortunately, the subsequent history of Krkonoše National Park has repeatedly shown that even this case was not a sufficient lesson for the promoters of various megalomaniac projects.



The KRNAP Administration Správa KRNAP has continued to conduct long-term monitoring in the Modrý důl Valley. In this photo from 2012, Miroslav Válek is using GPS equipment to measure the area and depth of the snowbed known as the 'Map of the Republic' (photo Kamila Antošová)

02

The Year 1968 in Krkonoše

Occupation of the primeval forest on the Rýchory Ridge

The events from the year 1968 have been described and evaluated from many different perspectives. Even in the border region of the Krkonoše Mountains in these August days, especially the events in Trutnov, where the local people resisted the Russian occupiers for three days, have been described in detail and it may seem like 'carrying coals to Newcastle' to return to the fateful month of August, 1968 once more. However, it is less known that there was also an act of occupation directly in the Krkonoše National Park; in its easternmost part on the Rýchory ridge. Thus, the events from August, 1968 directly affected the staff of the Administration of the only Czech national park at that time and their later fate. Here is an account of what preceded and followed after 21st August, 1968 in the Krkonoše National Park and its Administration.

Intercamp

In the early years the fledgling managers of the national park needed to gain as much experience as possible of how to care for the natural wealth entrusted to them, and thus attempted to get involved in European affairs in the field of nature conservation. The partial easing of the political situation in the years 1967 and 1968 was inclined to this and it was not a problem for junior conservation staff to travel abroad, particularly to the West German Lüneburger Heide Park, where an international youth nature conservation course was held.

These meetings of young conservationists took place under the auspices of the IUCN (World Conservation Union) and other institutions, and were known as INTERCAMP. The KRNAP Administration employees, Ing. Václav Veselý, and later, Ing. Josef Fanta spent a number of days in the German natural park and gained valuable information on how to take care of a territory with the statute of a national park and on how to engage the public, especially young people. In previous years the IUCN Commission had agreed that Krkonoše was a good place to host the



The enchanting atmosphere of the Rýchory primeval forest was seriously endangered (photo Ladislav Jirman)

2nd Czechoslovak International Nature Conservation Youth Camp (the first was held in 1966 in the Slovak Paradise). Therefore, on their visits to Lüneburger Heide, both staff members closely observed everything that would be significant for the realisation of INTERCAMP in the Krkonoše Mountains.

Youth Camp

The dates were set from 17th–31st August, 1968. Twenty young people from ten European countries met up in Prague, before travelling to Krkonoše two days later, where the main part of the conservation programme was to be held. On 20th August, the camp participants were introduced, with keen interest, to the Dvorský les Nature Reserve, with various KRNAP Administration activities and the conservation programme at the Sokolka chalet, where they were staying. In the evening everyone sat around a blazing campfire with debates and singing. Late at night our sociable fun was only disturbed by the noise of aircraft, but at that moment none of us knew that a brutal act of military aggression, which so deeply affected our society, had already been unleashed. It was not until morning when the KRNAP Administration Director Miroslav Klapka arrived and informed us what had happened. The reactions of the participants in the camp, young

people from different corners of Europe, were very different, but nevertheless the camp and its programme continued.

However, on the 21st August the military units did not remain on the approach roads under the mountains. Russian and Polish units were in Maršov, while the events in Trutnov are well documented. The passage of the military convoy around the Hoffmann Chalet towards Vrchlabí and central Krkonoše was temporarily prevented by the efforts of certain residents of Černý Důl, who blocked the road above their village by blasting huge blocks of quarry limestone from the quarry face. Even today the massive and overgrown boulders lying below the road remind us of the active resistance of our people and their efforts to do anything against the occupation. However, on that sad day in August, a small Russian communications unit came up onto the Rýchory ridge and set up camp in the middle of the nature reserve. Its mission was to ensure radio communication between the southern and northern sides of the Krkonoše Mountains. Director Klapka was extremely outraged by the soldiers' insensitive approach to the surrounding nature (terrain rutted by heavy vehicles, digging trenches, cutting down trees in the forest, which served as a source of timber for firewood ...). He therefore asked the Russian member of the conservation camp Ljuba Kuleši to act as his interpreter and they



On the trail of the occupants (photo Krkonoše National Park Administration archive)

both went to the commanding officer of the Russian troops. He was infuriated by this ‘cheeky’ approach from a civilian, vigorously sent Director Klapka away, and began a long conversation with the young Russian girl. Unfortunately, she returned to say that the Russian officer had clearly (!) explained how things were in our country, convinced her of the existence of counter-revolutionary elements among us, the friendly assistance by the neighbourly Warsaw Pact armies and all the other nonsensical gibberish that in the following days, months and years, the comrades brainwashed us with.

Military Camp

During the following days the INTERCAMP proceeded, although ultimately it did not manage to protect the natural resources of Rýchory. For twelve long months the Russian unit ‘cultivated’ the ridge and ‘cleaned out’ the Dvorský les Forest. The soldiers were not to be envied, as they spent the harsh winter months in their truck cabs and in improvised shelters (partially underground). They were also frequent guests at the nearby Rýchorská Chalet, operated by the Beck family, who successfully exchanged warmth and food for diesel fuel to power



The first Director of the KRNAP Administration Miroslav Klapka meeting with volunteer rangers in 1969 at Rýchory (Otokar Štětka, Commander of the Krkonoše Mountain Rescue Service in the background) (photo Krkonoše National Park Administration archive)

their generator. Zdeněk Říha, the nature protection ranger at Rýchory, could tell you all about it. Director Klapka did not want to accept the devastating behaviour of the soldiers in the nature reserve (as written in his job description) and he tried hard to get the soldiers and their equipment relocated elsewhere, where they would not do so much damage to the nature. Neither the county, nor the regional, party officials were able to convince him to recognise that the presence of soldiers in the protected area was necessary. In the summer of 1969, after many months of his opposition to this senseless act, a tour of the damaged areas high on the Rýchory ridge, with the participation of the Czech Commissioner for the Stay of Troops and Russian military chiefs, was held. A protocol was presented to affirm the term of the unit’s departure, including the restoration of the damaged terrain. The many-times quoted statement by a Russian officer who was present at this meeting was heard. When Director Klapka tried in vain to explain to him that dead trees are part of the primeval forest and belong in the reserve, the officer countered that they also have a lot of reserves, but he had never seen such a mess in the woods as here ... How would the nature at Rýchory have suffered if Director Klapka’s personal struggle had not finally been



The job was completed, despite the creeping counter-revolution (photo Krkonoše National Park Administration archive)

crowned with success? It was a win for Rýchory and Krkonoše National Park, but at a heavy price due to the personnel purges which followed under the auspices of the normalisation process.

Normalisation

To my knowledge, the expulsion of occupation forces at that time only happened here in the Krkonoše Mountains, and also near Český Krumlov in South Bohemia, where heavy military equipment was also deployed in the Vyšenské kopce SNR. In both cases however, the troop withdrawal was followed by the persecution of the main actors of the removal. Director Miroslav Klapka was removed from office by the founder of the KRNAP Administration – the East Bohemian National Committee. The comrades could not forgive him for disagreeing with the occupying troops and even achieving their departure. The dismissal decree was conceived in the style of “You have lost the confidence that your socialist country placed in you.” It was a great pity, because Mirek Klapka was an excellent first director of the first Czech national park. He was popular with the people for his direct, honest and friendly behaviour, did

not pretend to be a ‘know-it-all’ and relied on common sense and expert opinions from his colleagues. It is said that the uptight officials at the Ministry of Culture (the Ministry of the Environment was established in 1990), were shocked when he turned up for a meeting with the minister dressed in leather shorts with a hunting knife at his side. In the enthusiasm for the personalities of the Dubček leadership he was often spontaneously addressed by strangers, because he looked very much like Čestmír Císař, the Chairman of the Czech National Council, and one of the key figures in the Prague Spring. At the end of the 2nd Czechoslovak INTERCAMP he bade a very informal farewell to the young foreign conservationists by organising a campfire, where he prepared delicious roast pork for everyone.

In September 1970 Miroslav Klapka returned to his original profession as foreman at the mine in Radvanice, however, he did not forget about Krkonoše and still meets many of his former colleagues to this day. He recently celebrated his 80th birthday and I found it very pleasant to meet him and reminisce on the early years we spent together at the Krkonoše National Park Administration, including the occupation of Rýchory Forest. The events at Rýchory are recalled to this day by several clumps of daffodils blooming every year, which the soldiers planted during their year-long stay (it is hard to say whether for emotional or culinary purposes), and also two striking rows of opportunist willow bushes that fringe the ruts left by heavy vehicles on the heathland in front of the primeval forest. Regular readers of Krkonoše magazine, who have kept the issues from 1968-69, will find that they contain a number of hidden allusions to these events, including an excellent illustration by the cartoonist Vladimír Renčín, which aptly documents the absurd atmosphere of the normalisation years. This well-designed magazine was produced at the KRNAP Administration by Jirka Sehnal, who was also removed as editor in 1970 for political reasons. By that time, the comrades had already replaced Miroslav Klapka as director by the confirmed and hard-line communist Václav Veselý (not Ing. Václav Veselý, the head of the Nature Protection Department) and for the next three years he led the era of normalisation activities in the KRNAP Administration.

Motorcycle Olympics

**A trauma
(not only for)
Krkonosé
conservationists**

The year was 1972 and the nine-year-old KRNAP Administration had experienced a diverse showcase of successes and failures in protecting the nature in our first national park. Among the successes were a functioning network of professional and volunteer KRNAP rangers, establishment of the Scientific Council, publishing the increasingly popular Krkonosé magazine, the start of electrification and dismantling of surface power lines to the mountain chalets, acquisition and starting the reconstruction of the museum, the successful outcome of the Modrý důl case and hundreds of extremely important everyday contacts with various inhabitants and users of the Krkonosé Mountains. However, the setbacks included the failed effort to prevent several megalomaniac projects like the Hotel Horizont in Pec, the construction of the Polish Chalet on the summit of Mt. Sněžka, the new Labská bouda Chalet or organisation of the International Six Day Trial Motorcycle Race in the Krkonosé Mountains in 1972. Here are the facts, context and impact of these traumatic events.

Mountains as sporting facilities

Our highest mountain range ranks among the top localities, not only in the Czech Republic, for its unique natural and landscape values, but the same parameters make it a tempting area in which to compete with nature, its elements and pitfalls. Since the late 19th century, the Krkonosé Mountains had become a renowned tourist and later sporting destination and from the foot to the summits of these central European mountains, man had been trying to succeed in his duels with the harsh montane nature. The operation of various skiing activities, summer and winter tourist crossings of the mountains or attempts to conquer the peaks of the Krkonosé Mountains using various contemporary technical resources have taken increasingly conflictual forms, and have been in conflict with the national park's legal status since 1963.



The mountain slopes tested the durability of competitors and their machines (photo Miroslav Hladík)

The situation was no different with sporting challenges – for example, riding a bike, motorbike or driving a car to the top of Mt. Sněžka. Therefore, the demanding Krkonoše terrain also attracted the organisers of the motorcycle ‘Olympics’, known as the International Six Day Trial (hereinafter referred to as the ‘Six Day’), which has taken place intermittently since 1913 at various locations around the world. The Czech organisers had already had a successful premiere in 1957, when this popular competition took place in the Krkonoše Mountains in for the first time. The Six Day was held here for the second

time in 1963, when the still very young KRNAP Administration was not strong enough to persuade the partners that such activities are inconsistent with the statute of a national park. Despite great resistance the Six Day went ahead.

When the Six Day organisers turned to the KRNAP Administration and other relevant authorities in advance with a proposal to hold the 47th year in Krkonoše, it caused great indignation among conservationists and a marathon of complex negotiations between all interested parties – from senior

government and party circles to the local people who had legitimate concerns ... On the one hand, there was already plenty of evidence of the impact that the two previous two runnings of the Six Day Race had had on the Krkonoše terrain and nature, while on the other hand, there was a strong argument from the representatives of our industrial manufacturers of the significant economic and social impacts for us, in the case of success for the Czechoslovak team. Unfortunately, at that time, and many times afterwards, the Krkonoše National Park suffered due to the very broad, and unfortunately vague (and politically exploitable) definition of the main regional development guidelines in the Krkonoše Mountains, which stated the following four main functions: (1) natural science, (2) recreation, (3) water management and (4) economic. Unfortunately, during negotiations it then depended on whom, and how, and in what order, these functions were prioritised, or which project was demagogically promoted under the guise of the priorities of the whole society.

Motorcycle arena

Time passed quickly in such an atmosphere and the chances of a finding a peaceful and pragmatic solution for the Six Day faded away. So one day, a document from the Ministry of Culture (nature conservation fell under the auspices of the MC) appeared on the table of the KRNAP Administration Director Václav Veselý, which granted the organisers of the 1972 Six Day an exemption from *Act No. 40/1956 Coll., on the State Protection of Nature*, in the form of permission to organise this competition in the national park. Among the range of different conditions that seemed to support the position of conservation, there was a truly significant one, namely that this is the last motorcycle competition to be held in the Krkonoše National Park. At that time, unofficial information leaked out from behind the scenes indicating that the decision-making in this difficult case was of huge concern for the government and political institutions, in that a refusal of the application on the part of the organisers could be perceived by the 'West' as a clear symptom of the 'Iron Curtain'.

The discussions ended and the uphill battle for conservationists and organisers of how to manage everything in such a short time began. Approval of the

selected routes by nature protection authorities and the Ministry of Culture, so they did not encroach on the state nature reserves, detailed documentation of the condition of the routes, the protocol for the handover to the race organisers (and the subsequent repossession after the competition), providing increased supervision by nature protection personnel (also from other protected area administrations), application of the requirements to rectify all damages etc.

So, autumn arrived in 1972 and from the 11th to 16th of September nearly 400 competitors from 18 countries rode the Krkonoše trails. The riders fought against bad weather, challenging mountainous terrain and the technical condition of their motorcycles. Hats off to the sporting performances by all, and especially by our team, which was outstandingly successful in the 47th Six Day, both in demonstrating their skills, and also the abilities of our designers of motorcycle products. This is how it was presented in our media and our people were in a good mood. But this euphoria was not shared by the Krkonoše conservationists, because it soon became apparent how much damage the Six Day had caused to the trails.

Here is a brief recap: the total length of routes of the stages was more than 1,500 kilometres, while some sections were ridden repeatedly. Some stages led high up into the mountain areas of the national park (Dvoračky, Mísečky, Zadní Rennerovky, Mt. Černá hora, Mt. Růžová hora). The hiking trails, footpaths and unpaved paths were definitely not designed for such a working load, which was clearly visible from their condition after the competition. Severe damage was apparent on a total of 25 km of mountain paths. Despite the initial promises, the damage was only repaired at a fraction of sites, so that by the spring of the next year, erosion had turned the paths into unusable muddy or rocky channels. In addition, some sites were inaccessible for the KRNAP Administration trail repairer's machines, so repairs dragged on for months or even years. Throughout the week and from six in the morning until late evening, the Krkonoše Mountains were exposed to enormous noise from the motorcycle engines, their number increasing daily as well as a number of 'wild riders' from the support teams and from the ranks of visitors. In the eyes of lovers of powerful machines the hosting of such a prestigious competition de facto legalised such movements within



On the other hand, the strength of the motorbikes and the motivation of the competitors caused great damage to the terrain of the Krkonoše National Park (photo Miroslav Hladík)



In places the wheels of motorbikes have carved into the hump between the ruts on the trails, while in other places they have carved channels, which serve as the basis for rapid water erosion (photo Jan Štursa)

the national park. In addition to the damage to the environment, the high noise levels and emissions of exhaust gases, the educational work by the KRNAP Administration suffered irreparable damage. It was then hard to explain to regular visitors to the Krkonoše Mountains, why they are fined for minor offences, while on the other hand, the territory of the national park may be destroyed with impunity by something so large and organised.

Later, the editors of the Krkonoše magazine received many letters, the authors of which all condemned the staging of the Six Day in the national park, without ignoring or denigrating the performances of the competing teams and any promotional or commercial aspects. "Why not, but we could have held this event outside the national park, where we can certainly find plenty of space to showcase top quality riders and designers of racing machines ...", was the opinion of many. In one letter, the writer wrote: "... muddy boots on a clean tablecloth ... Who would have endured this at home? Yet we can tolerate dozens of roaring motorcycles on the trails in the protected Krkonoše National Park. After all ... in our country we can find the right place for anything useful! ... "

The strict conditions of the Ministry of Culture that similar events would never be organised in the national park, was already questioned at the end of this Six Day when came the words "Good bye and see you again in the Krkonoše Mountains in three years time for the 50th year!" Fortunately this did not happen and the Six Day in 1975 was held on the Isle of Man in the UK. However, in 1987 and 1995, engines thundered in the northern foothills of the Krkonoše Mountains, this time around Jelenia Gora, and several stages led through the Karkonoskiego Park Narodowy. Also in the

neighbouring Jizerské Mountains PLA conservationists lost their battle with the organisers of the 77th Six Day, which took place in Jablonec nad Nisou in 2002 and led into the protected part of the Jizerské hory Mountains.

Regulation of mass participation events

At the end of the last century the very popular cycling Peace Race repeatedly swept through the Krkonoše Mountains, with one stage climbing up to finish at the Vrbata Chalet. Again, it brought a disproportionate burden on the KRNAP territory, unfortunately this time with the organisational participation of the KRNAP Administration. The new Act on nature and landscape protection, which has been in force since 1992, brought a somewhat better atmosphere for the negotiations. This contains a passage on the organising of mass events within national parks ("On the territory of the National Park it is especially forbidden ... to hold and organise collective sports, hiking and other public events outside of places specified with the agreement of the nature conservation authority").

Let us wish for the Krkonoše nature, that the KRNAP Administration is always very sure-footed within the meaning of the legal paragraphs, when assessing the pros and cons of modern outdoor activities. So that modern-day conservationists do not have to consider their decisions under the ideological pressure which we experienced in the last century, when the KRNAP Administration was even the co-organiser of the annual pilgrimage by children and youth in Socialist Youth Movement (Pioneer) scarves and shirts to the summit of Mt. Sněžka.

04

Ascents of Mt. Sněžka by Pioneers and Youth

The Krkonoše mountain syndrome from the normalisation years

Most prominent mountain ranges and their highest peak have always presented challenges for man – driven by different motivations – to try to overcome their majesty. Ascents in the Himalayas, Alps, and Tatras or in the central European Krkonoše Mountains were not only long-term destinations for climbers, hikers, scientists, writers or painters, but also spiritual and political functionaries. Vladimir Ilyich Lenin became one of the political climbers in 1913, when he climbed Mt. Rysy in the Tatra Mountains and inadvertently launched the later era of using, or rather abusing, the mountains to promote a variety of ideologies. For him it was a normal tourist trip by a man who spent his forced exile on the Polish side of the Tatras, but the tradition of the International Youth Climb of Mt. Rysy began in 1957. Clearly, this became an established model and the tradition of mountain gatherings by opponents of fascism followed the same model established by Lenin. They took place in 1922–1932 in various locations on the Krkonoše mountain ridges. The participants' motivation at the time of Hitler's rise to power was clearly understandable and undoubtedly expressed the high moral standards and bravery of the participants. A few decades later, it was a completely different story.

Primarily collectively

It was a rainy and foggy weekend in June in 1973, when the KRNAP Administration organised the 'Ascent of Mt. Sněžka by Pioneers and Youth' for the first time. The aim of this event, with the participation of the Regional House of Pioneers and Youth in Hradec Králové and the Communist Party County Office in Trutnov, was "... to introduce children to the rich history of the labour movement in the Krkonoše Mountains, in particular to the international proletarian meetings that were held here from 1922 to 1932. And at



Gathering of participants of the Ascent by the Memorial to the Worker's Meetings at Pomezní Boudy before the political speeches and greetings. After the slogans were recited, a long caravan of participants set off for the summit of Mt. Sněžka, with no thought for how long the surface of the mountain would take to recover from such pressure (photo Jan Štursa)

the same time, to show children the beauty and natural wealth of Krkonoše National Park and to familiarise them with the need to conserve the nature of our biggest recreational region ... " This is an excerpt from the article which the *Krkonoše* magazine (No. 4/1973) printed at the time, and was reprinted virtually as a carbon copy by different authors over the 17 long years which followed. Up to 1989, hundreds of Pioneers, Socialist Youth Movement members, dozens of guides from the KRNAP Administration, Krkonoše Mountain Rescue Service or the Border Guards set out from the Špindlerova Chalet, from the Pomezní Boudy Chalets, from Karpacz and other places beneath the mountains, for the summit of Mt. Sněžka, under the watchful supervision of ideological political functionaries of differing calibres, from local and district branches of the Communist Party and SSM, to the leaders of the Communist Party Central Committee. So much preparation and money was spent to make this 'event of the year' a success! Only the Giant Krakonoš boycotted the event and the participants, regardless of their political leanings, were most often rewarded with the worst weather that Krkonoše could throw at them. Then in the wind, fog, rain, and often in the snow, the youth wearing their commemorative badges and accompanied by their guides trekked from the Obří bouda Chalet or from Pomezní Boudy Chalets, in pursuit of a cup of tea if they managed to get to the summit of Sněžka.



In the years when the mountain ridge trail was closed, the Travers trail suffered from excessive pedestrian traffic (photo Jan Štursa)

For most young people Mt. Sněžka certainly represented a strong motivation – to climb to the summit, while experiencing some fun and even learning something interesting from the national park staff at the same time. Most of these events took place on both weekend days and the Saturday evening was filled with an entertainment programme. Of course, there was always a meeting with veterans of the pre-war events. In later years the KRNAP Administration also organised accompanying conservation programmes, in which hundreds of children's hands assisted the park staff with waste disposal, clearing brushwood from clearings or repairing mountain trails and their surroundings.

It was always necessary to somehow endure the political allegory surrounding each Ascent – the flood of Pioneer scarves, Socialist Youth Movement shirts and ironed uniforms, singing the Internationale, the



Those who reached the summit often recovered in close proximity to critically endangered species of Krkonoše flora – the Daisy-leaved Speedwell (*Veronica bellidioides*), Spiked Wood-rush or the endemic Krkonoše Dandelion (photo Jan Štursa)

red flags and bouquets of carnations, and in particular the speeches by domestic and foreign party and youth leaders, uttered before the concrete Memorial at the Pomezni Boudy Chalets. Their content never changed, only the speakers alternated. The district and regional garniture were never missing and communists from the highest circles such as Biřak, Jakeř and Mohorita were often present. The initial Czech-Polish participation was later complemented by East German and Soviet delegations, and eventually included delegates from distant destinations – from Cuba, Vietnam, Cambodia, North Korea ... Guests spoke and then some of them took the role of gardeners every year when they planted a new Rowan tree in the alley around the Memorial. On one of his visits Vasil Biřak found himself in a comical situation. When the omnipotent secretary of the Communist Party Central Committee leant onto his spade for the first time, all that remained in his hand was a broken handle. It was hard to keep a straight face as we watched the official entourage scurrying around in confusion and trying to solve the resulting embarrassment. Another funny situation arose before the XIth Ascent. The KRNAP Administration had to prepare a brochure for participants, which would describe the history of pre-war workers' rallies in the mountains. The manuscript was almost in the printing press, when

the editor-in-chief of Krkonoše magazine Frantiřek Janalík, who was responsible for proofreading, discovered at the last minute that the passage from the text "... to commemorate the anti-fascist rallies ...", was missing one syllable and in fact read the "pro-fascist rallies". Who knows what would have happened if the brochure had been published without correction and 2,000 children had taken it home? It was remarkably easy to find a celebratory context for each year of the Ascent. Once it was anniversary of the Great October Socialist Revolution, another year it was a relevant party congress, global youth festival, anniversary of the liberation of our homeland, anniversary of the Slovak National Uprising, International Year of Peace, etc. Party chroniclers were simply not allowed to omit anything which could add to the seriousness of each Ascent.

Organised trampling

In the atmosphere of absurd ideology that our society experienced in the 1970s and 1980s, the speeches at the ascents were only a drop in the ocean of nonsensical phrases, which surrounded us on a daily basis. But the contradictions of that XVIIth Ascent lay elsewhere. The event took place in a strictly protected part of Krkonoše National Park, while the KRNAP Administration itself, which is responsible for its protection, was the co-organiser of the event. During a few hours every year, at least 2,000 people set out for the summit of Mt. Sněžka, which then resembled a human anthill instead of a State Nature Reserve (this category of protected area was replaced by the NP First Zone by Act No. 114/1992 Coll., *On Nature and Landscape*). Not all of the guests trekked to the summit on their own feet, and there was often a traffic jam of cars with political officials, between the Silesian Chalet and the summit of Sněžka. Such a burden was clearly harmful and unsustainable, so the two Krkonoše National Park Administrations indeed acted schizophrenically. The accompanying conservation activities in the programmes of the Ascents made little difference to this fact. On the one hand, we tried to defend against undesirable construction and reconstruction of buildings on the summit, but on the other hand, we were contributing to the damage to the Sněžka massif ourselves by supporting the ascent. Several times extremely bad weather even forced a change from the usual route via the Pomezni Boudy Chalets and Mt. Svorová hora to the summit

and young people then trekked along the Traverse, an unpaved trail on the slopes of Sněžka. The damage to this trail was still apparent many years later. The Traverse trail was even more damaged due to the state of emergency in neighbouring Poland – the border trail was closed from 1981 to 1984 and the summit of Sněžka was only accessible by this trail from the Pomezní Boudy Chalets.

The opposite extreme

The year 1990 arrived and was accompanied by social and political changes that are reflected in the fate of the Krkonoše Mountains. The ascents of Mt. Sněžka under the auspices of the KRNAP Administration ended (although many extremely left-wing citizens stubbornly repeat them). At the request of Malá Úpa village, the Memorial to the Workers' Rallies was removed from list of registered cultural monuments by the Ministry of Culture. The justification stated that it had been inscribed on the list in the previous period exclusively for political reasons, without possessing an exceptional level of artistic or historical significance. The concrete Memorial was demolished and removed in November, 1994.

Paradoxically, it was only possible after 1990 to remind the public of other meetings which were conspiratively held on the Czechoslovak-Polish border in the Krkonoše Mountains, during the period of communist totality. In the 1970s the system of 'small border traffic' was introduced and in the name of Czechoslovak-Polish friendship, several meetings between Czech and Polish dissidents and critics of the communist ideology took place here. Havel, Kubišová, Šabata, Petřivý, Michnik, Kuroň, Mytiński and other representatives of political dissent hiked to the border in Krkonoše in the role of ordinary tourists, in order to

share their experiences. Even high in the Krkonoše Mountains they were closely monitored and repressed by the secret police. The apparent similarity of these meetings on the Czech-Polish border to those in the pre-war and pre-revolutionary years of the 20th century is striking, but the motivation and ideas of the actors in these two generations of meetings were diametrically opposed.

Then came the 17th March, 1990 when the historic meeting between the politicians Václav Havel and Lech Wałęsa took place near the Špindlerova Chalet, and the idea of a freely permeable 'green border' came closer to reality. In September of the same year the Pomezní Boudy Chalets hosted another political rally, but with different actors, a different atmosphere and totally different ideas about the future of both of our nations. In the presence of Jiří Dienstbier, Jiří Ruml, the dissident from Malá Úpa Dáda Fajtlová and Polish friends, President Václav Havel personally cut the chains on the border barriers and the border symbolically opened.

How can we conclude our trip through the recent history of the Krkonoše mountain ridges? Perhaps with the wish that the unique nature of Mt. Sněžka is not unbearably burdened by further mass events (whether authorised or 'illicit') in the future, in which the organisers and participants see in the existence of the highest peak on the Polish-Czech border, a compulsive challenge to conquer the summit and leave their imprint. It does not matter whether the motivation is to participate in the St. Lawrence Pilgrimage, Maternity March to Mt. Sněžka, Pilgrimage to the Sunrise, to take a comfortable ride on a chairlift or an honest hike on the highest mountain in Krkonoše. The maximum capacity of its nature has long been exceeded, which may be a mortal danger for the majestic Mt. Sněžka in the future.

05

The Labská and Luční bouda Chalets

Modern fates of mountain chalets on the Krkonoše ridges

Information about these two mountain ridge chalets has been published many times, from various historical, tourist and conservation perspectives. In the context of the lively discussion that is currently taking place over their future, it may be useful to make a new comparison of what the two chalets have experienced in the context of conservation reality – after all, they both stand in the strictly protected First Zone of Krkonoše National Park.

History and present

The Luční bouda Chalet (1,400 m) was founded in the early 17th century and its position on the Silesian Trail, which linked Bohemia and Silesia across the eastern Krkonoše summit plateaux, predetermined the importance of this initially summer grazing chalet. During the era of mountain chalet farming, it gradually grew in importance and also in size, and by the early 18th century, it was one of the largest mountain ridge chalets in the Krkonoše Mountains. In 1914, with 100 rooms it was easily the largest chalet in Krkonoše, with tourist usage predominant, although the surrounding land was farmed until the mid-20th century. The mission of the chalet expanded during the war years to include military-strategic usage. The chalet burnt down at the beginning of World War II, but was rebuilt and renovated inside to its present form (accommodation capacity for 150 people in rooms and multi-bed dormitories).

The Labská bouda Chalet (1,320 m) is nearly two centuries younger (1830) and from its founding it primarily served as a shelter for tourists as they hiked along the ridges of western Krkonoše. The medieval Bohemian Trading Trail, which passed close to the Labe (Elbe) River Spring, lay less than a kilometre to the northwest from here. Along with Mt. Sněžka, the spring has always been one of the most visited places in the Krkonoše Mountains. The location of the Labská bouda Chalet close to the monumental Labské jámy Cirques, the attractive Labe and Pančava Waterfalls and the Labe (Elbe) River Spring attracted many tourists. The functional usage of the Labská bouda Chalet is much poorer when compared with the Luční bouda Chalet, although its history is not short on significant events. The old Labská bouda Chalet burnt down in 1965 and the new facility has been in operation since 1975 (accommodation capacity of 100–120 persons).



The construction of Labská bouda was preceded by massive transfers of soil, which irreparably changed the nature in the surroundings of the Labské jámy Cirques (photo Jan Štursa)

In the winter season both chalets serve as terrain stations of the Krkonoše Mountain Rescue Service and very important and long-term meteorological monitoring of the climate on the Krkonoše mountain ridges is carried out in the close vicinity.

Transformations and consequences

Any changes to the originally small chalets leave long-term and important marks on the landscape and mountain nature, ranging from changes in the architecture and landscape character, through the significant transformation of the character of the surrounding environment, access roads, auxiliary discrete and linear structures, water and waste management, to the expansion of tourism and sports provision.

The gradual increase in the bed capacity of the chalets caused a disproportionately high burden on the

main access roads, which were repeatedly damaged and repaired, widened and strengthened. During the construction of the new Labská bouda Chalet, the supply route was so badly damaged that it had to be completely reconstructed. For months, however, only a basement layer of coarse gravel lay on the surface and thousands of tourists opted for a more comfortable walk across mountain meadows in the area, causing long-term and entirely unnecessary damage to them. In the 1970s, the supply road from Modré sedlo Saddle to the Luční bouda Chalet was so badly damaged that the supply vehicles started to drive along the edge of the surrounding meadows. "We cannot bring broken eggs and other fragile material to the chalet," argued the chalet manager. In the 2nd half of the 20th century the trails were unsuitably repaired using hundreds of tons of limestone, basalt or melaphyric aggregates, from which calcium and magnesium flushes out into the nearby naturally acidic soils in the long-term. During heavy rains the finer gravel was washed tens of metres into the surrounding nature. This was not only wasteful, but the nutrient-rich material immediately began



The accessible 'double-path' to the Luční bouda Chalet was a huge scar on the ridge of eastern Krkonoše in the 1980s (photo Jan Štursa)

to act (and still acts!) as the source of undesirable eutrophication (enrichment) of the surrounding mountain soils. It caused distinct changes in the natural flora (and subsequently the fauna) near the trails. As you leave the two chalets, notice how far around the trails the dense growths of Ragwort, Thistles, Lady's Mantle, Dock, Buttercup and other expansive weeds stretch, e. g. in the section between the Vrbatova Chalet and the U Čtyř pánů trail crossroads, or between Výrovka and the Chapel. Removing the causes – the rock – also the aftermath – weeds – is extremely complex and costly.

Paved roads have led to both chalets for many years. This resulted in a more than contradictory situation. Asphalt-surfaced roads are better at supporting the load from heavy supply vehicles, and at the same time they are best protection for the bedrock (regardless of their chemical composition) from water erosion and runoff into the ground. On the other hand, some bituminous mixtures can contaminate the environment with toxic polychlorinated biphenyls (PCBs). Therefore, a strict requirement for the use of harmless types of asphalt was applied during the planning process. Fortunately! However, the paved surface led to another problem – the Labská and Luční bouda Chalets became accessible to cyclists.

The long-standing dispute between conservationists and mountain bikers was ended by a compromise – a multi-year exception from the KRNAP First Zone and monitoring of all circumstances connected with the access to the Luční and Labská Chalets for cyclists.

Waste and what to do with it

In the distant past the mountain chalet farmers did not worry much about waste disposal. Ash from their fires was spread around the chalets, or left in piles. Waste water flowed directly or through drains onto the surrounding meadows. The massive increase in the accommodation capacity of the chalets during the era of mass recreation in the second half of the 20th century, brought the problem of where to put all the waste? Stinking piles of waste were piled up around the chalets. The area behind the Luční bouda Chalet became famous for its mixture of paper, plastics, ash and food waste from the kitchen. After a strong wind the area around the chalets looked nothing like a nature reserve. For several years, the waste was transported to the nearby sand quarry on the edge of the nearby Úpské rašeliniště Peatbog. In the end, controls and sanctions from the KRNAP Administration eventually forced the chalet managers to deal with waste management and transport the municipal waste away.

However, water management was a bigger problem. The great increase in consumption was not reflected in the quality of waste water treatment in various septic tanks, so the surroundings of the Luční and Labská bouda Chalets slowly changed into a paradise for various weeds and the banks of the Labe and Bílé Labe streams below the chalets were a deep green colour from spring to autumn. The variety of mountain vegetation there was pushed out by growths of nitrophilous Docks, Nettles, Knotweed, and more extremely expansive plant species. Repeated accidents at the, initially only biological, septic tank under the new Labská bouda Chalet caused such soil contamination by nitrous compounds, that the spruce and dwarf pine stands died within two years.

A similar fate befell several generations of Brook Trout in the Labe meanders on the floor of the Pančavská jáma Cirque, a few kilometres downstream of the wastewater discharge. It should be noted that both streams have sufficient flow and self-cleaning ability to dilute harmful substances so that their water meets the valid hygiene standards by the time it reaches Špindlerův Mlýn.

However, aquatic and riparian ecosystems do not enjoy any legal protection, so the undesirable nitrophilous organisms are spreading out from the immediate vicinity of the two streams. I do not want to even imagine what would have happened if the builders of the new Labská bouda Chalet had failed to realise their error, when, after a few days of digging a trench for laying waste water pipes, that should have carried the waste water into the rocky Labská rokle Ravine and the Labe stream, they realised that the pipe led through the hillside peatbogs and directly into the Navorská jáma Cirque, one of the natural treasures of western Krkonoše. Fortunately, this was avoided at the last minute. Today, both chalets have more or less functional biological wastewater treatment plants. Nevertheless, hydrobiological research near their outflows has confirmed significant changes, especially in the quantity and quality of aquatic flora. This is certainly alarming in the First Zone of the national park.

Diesel, electricity or light fuel oil?

We may skip the beginnings of both chalets, when they were lit in a very economical manner and all physically demanding tasks had to be carried out by people with

the help of animals, and later steam. The industrial era, however, was accompanied by the use of electrical energy and even chalets high up in the mountains looked for ways to use it. This came in the form of diesel generators, which not only brought the risk of stored fuel leaking into the surrounding environment, but also the danger of chalets catching fire and burning down (e.g. Klínová bouda Chalet in 1970). Chalets were connected with the world via the telephone line, with cables stretching across both montane plateaux. These cables have gradually been removed, but with the expansion of both chalets, the need for electricity was still acute. At the end of the 20th century the Krkonoše Mountains experienced a massive electrification and a number of challenging linear structures were built. The mountain ridge buildings were ingeniously connected by underground cables into a number of circuits to provide the chalets with a permanent (but expensive) source of energy. At this time the buildings on the summit of Mt. Sněžka were connected with Pec, the Luční Chalet via the Richter Chalets, or the Labská Chalet via the Martinova Chalet to the large centres in the valleys. This brought intensive digging work to the mountain ridges and the nature only recovered slowly from these works. The positive side of things was the gradual elimination of unsightly electricity pylons. Further projects were also considered in the attempts to connect everything to everything else, such as laying a cable from Luční Chalet, across the Úpské rašeliniště Peatbog to the envisaged new buildings on top of Mt. Sněžka. We managed to avoid this; because of the risk of irreversible damage to the tundra landscape was too high. Within the framework of cooperation between the institutions on the Polish and Czech sides of Krkonoše, the cable from the Labská Chalet was extended to the Śnieżne Kotły Cirques and other cables were laid from Pec pod Sněžkou to the summit of Mt. Sněžka. Now that the vegetation has grown back years after the cables were laid, there is a potential risk that the cable will have to be replaced, because its durability and the valid technical standards require it. It will not be easy to meet this requirement, especially as this cable lies in the First Zone of the national park.

Undoubtedly the most expensive operational cost is heating the chalets and the two chalets are heated burning light fuel oils, even though the fuel tanks pose a high risk of environmental accidents. The declared permeability of the fuel tanks at the Labská Chalet has been proven to be disturbed over the years, while in the case of the Luční Chalet a leak was even suspected, although it was never proven. This is why



Damage to the terrain along the route of the water mains to the new Labská bouda Chalet (photo Jan Štursa)

the operators of both chalets and the National Park administrators are extremely concerned about such a potential environmental time bomb.

Economy versus ecology

The ecological and economic relations of the mountain chalets are quite complex and it is not easy to make sense of what will follow if anything changes in the input parameters in these equations by several unknowns. I will try to explain it with an example of recent changes at the Luční and Labská Chalets.

The Luční Chalet profited from the fact that it was financed by the Czechoslovak Socialist Sports Association (CSTV) for decades. In the same period the Labská Chalet was part of the Krkonošské hotely Company (later Interhotely Krkonoše). The financial management and support for both chalets was completely different. The Luční Chalet benefited from countless ski and other training events for Czech sportsmen, had a sufficient room occupation rate, and prospered throughout the year from its location at the crossroads of hiking trails. This was not so with the Labská Chalet, with its lower bed capacity and the surrounding terrain which was not so attractive for holding mass events. So, along with other high mountain chalets, the Labská Chalet experienced years of alternating profits and losses, which left its mark on the condition of the building.

Then along came 1989 and the societal changes were reflected in the fate of the two buildings. The Luční Chalet repeatedly changed owners and its debts grew (even in the brief period from 1990 to 1993, when it was owned by the Czech Tourist Club). The Labská Chalet experienced similar problems. The KRNAP Administration then had to deal patiently with the new owners, who wanted to drive clients of foreign travel agencies to the Labská Chalet by bus; otherwise they claimed they would lose their clientele. Agreement was not reached, even though the KRNAP Administration suggested a compromise – arrival by bus at the Vrbatova Chalet car park, where luggage and less mobile guests could be transferred to the chalet by a gas- or electric-powered minibus, and only in the early morning or evening hours, with regard to the rights of other tourists to stay in the undisturbed environment of the national park. The high costs of providing such a service is probably why this compromise was never implemented. However, the rangers were repeatedly informed of such unauthorised vehicle trips to the Labská Chalet. I do not even want to imagine what risks the bus drivers would face when driving around the last bend close to the steep cliffs of the Navorská jáma Cirque! The Luční Chalet addressed and solved a similar problem by the frequent deployment of passenger cars and it is no exception for taxis from Pec pod Sněžkou to transport clients to the chalet. Of course, this is a highly controversial solution.

In order to increase the attractiveness of the chalets, the owners came up with a proposal to set up a ski lift to the Modré sedlo Saddle or the Labe Spring. It was not a rational calculation with regard to the statute of the First Zone of the national park, it would be difficult to justify legally (a ski lift to the Luční Chalet was even briefly in trial operation, but it was so inefficient and problematic, that it was soon terminated).

The next cases to arise concerned the apartments in the side wing of the Luční Chalet, concerts by popular music groups, plans for the construction or operation of a summer sports training areas for our national ski team around the chalet. However understandable such efforts from the perspective of the chalet owners are, the statute of the national park, and in particular its most strictly protected First Zone, where the two chalets are located, are based on other principles for utilising the natural values of the Krkonoše Mountains and are not easily adapted to the economic rules of business. What is the future of both buildings on the Krkonoše ridges?



The badly-chosen route for the trench carrying waste from the biological septic tank at the new Labská bouda Chalet led directly into strictly protected Navorská jáma Cirque. The mistake was corrected in time and the trench was backfilled and restored to nature (photo Jan Štursa)

Vision

Both chalets were repeatedly the subject of tender processes, the price increasing or decreasing according to the conditions on the Czech market, with candidates taking turns to bid for them. The KRNAP Administration also bid to buy the chalets by agreement with its founder, the Ministry of the Environment. In the case of the Luční Chalet, the Ministry of the Environment was interested in rebuilding the chalet and operating it as a national centre for environmental education. It is probably a good thing that this plan was not realised. I cannot imagine how the environmental sector would cope with the extremely difficult task of running a large mountain ridge chalet, while betraying the principles of nature protection in the First Zone of the national park.

If the current owners of the Luční Chalet are able to maintain a relatively decent standard of services, then this historically valuable building will not have to worry about its future. It should, however, take full

advantage of what is unique – it is situated in the dramatic landscape of the Krkonoše arctic-alpine tundra. In the 1990s the KRNAP Administration worked with the former owners of the chalet on plans to utilise the unique environment to improve the ‘genius loci’ of the Luční Chalet – an attractive permanent exhibition on alpine and tundra regions around the world should have been built here and events focused on the unique natural environment on the eastern ridges of Krkonoše for the general public and for experts, should have been held in the surroundings of the chalet. For a number of reasons, these plans were never realised, but it is extremely commendable that the chalet interior offers visitors a display of educational panels and period photographs to give visitors an idea of the unique values and historical events that are associated with this part of Krkonoše and connected to the Luční Chalet. Thanks for this exhibition belong to the KRNAP Administration staff, Mountain Rescue Service and the Veselý výlet Gallery.

This is certainly it is one of the future ways for the Luční Chalet to become more visible and differentiate itself from other Krkonoše chalets. This should bring benefits in the long term, in the form of a certain polarisation of the clientele that will search out the hospitality the Luční Chalet can offer. Regular and satisfied clients are a guarantee of prosperity, but also a guarantee of good behaviour in the national park.

The Labská Chalet has a significant handicap in comparison to its colleague in eastern Krkonoše. I have already described approached some of its operational problems in this paper, and others are discussed in detail in the magazine *Krkonoše – Jizerské hory* No. 3/2011. The seriously-meant intention of the Ministry of Environment and KRNAP Administration to purchase this economically unsustainable chalet, demolish it, clean up the surroundings, and build a reasonable small mountain building, slightly below the site of the original old Labská Chalet, failed due to lack of finance.

Both mountain ridge chalets have their unquestionable historical roots and right to exist in the future. In what form and with what range of services, is a common and a major challenge for all of us who have made the sensitive usage of the unique landscapes and nature of the Krkonoše Mountains our mission in life.

06

Grouching over the Trails

The origin of the limestone on the Krkonosé ridges

The surface of the Krkonosé Mountains is interwoven with dozens of kilometres of roads of various age, width, structure and purpose. They were built over many centuries to allow access to the Krkonosé landscape by the people who tended these lands at various times. The lives of the old mountain folk was characterised by their great humility to the environment, which had been their home for generations. Their years of experience of the rugged mountain landscape can even be read from the old roads – how the mountain folk built them, which way they led, and how they looked after them. However, life in the Krkonosé Mountains today carries on in a different atmosphere and especially the usage of the values of this intimate mountain range is not always without negative consequences. The roads in Krkonosé are legitimate witnesses to the good care, and serious mistakes, which were committed here during the turbulent civilisation boom from around the mid 20th century onwards.

Nutrient-rich gravel

The new geopolitical order after World War II started a range of processes in the Krkonosé Mountains, which were not always reflected on the face of the mountains in a desirable manner. One of the major problems in the middle of the last century was a sudden break in the continuity of life of the residents of Krkonosé and their knowledge of how to take care of the mountain landscape. The departure of the vast majority of the old German-speaking settlers resulted in the loss of their centuries of experience in taking care of meadows, forests, water, as well as the roads, and even the greatest efforts by the new settlers could not compensate for this lost knowhow. The situation was worsened by the maladies of the era of mass development of trade union recreation, in the spirit of the popular slogan 'the mountains belong to the workers.' Construction, demolition, renovation was happening everywhere, thousands of tonnes of construction materials were transported to and



Changes to the busy trail across the Úpské rašeliniště Peatbog. The picture on the left shows the original wooden boardwalk, which was maintained for years by the Mountain Rescue Service (the picture shows Jan Messner, who died on 16th January, 1975 together with Štefan Spusta, during a rescue operation on the northern slope of Mt. Sněžka). Unfortunately the wooden boardwalk was replaced by a causeway made of crushed limestone, which made it easier to get supplies to the Obří bouda Chalet. For many years this limestone corridor divided the Arctic peatbog into two parts and negatively influenced its nature. It took years until a successful revitalisation project was realised at the end of the last century, which enabled the integrity of this unique locality to be renewed (photo Jan Štursa)

fro and the mountain roads were full of heavy trucks. The old mountain roads were simply not built for such traffic loads. The roads quickly fell into disrepair, were damaged by water erosion and without proper, literally daily, care from road-menders; especially the mountain ridge roads and trails were soon in really bad condition. Everything belonged to everyone and no one wanted to invest in repairing something which did not actually 'belong' to him.

When it was established in 1963, repairing the roads became the one of the main tasks of the new Krkonoše National Park. Repairs and maintenance of the mountain roads were divided up between KRNAP, the Krkonošské hotely Company, the East Bohemian State Forests, and some of the Krkonoše municipalities. The various managers had different ideas about how to fund and implement the road mending craft. The KRNAP Administration gained control over most of the roads on the ridges and it embarked on the never-ending work of caring for the mountain landscape. The necessary machinery was purchased, the park rangers were joined by road-menders, who had to patiently learn how to take care of the roads. Every year, the KRNAP Administration's plan for its main tasks included several kilometres of roadworks, ranging from everyday maintenance to general reconstruction of these mountain communications.

The Praga V3S and Tatra trucks which were available at that time heralded the first change of in the form of

the mountain roads. The narrow roads had to be widened to accommodate the axle width of these vehicles. However, the necessary road-building materials – natural aggregates – turned out to be a much more serious problem. As we know, Krkonoše is mainly built of acidic rocks - granite, gneiss, mica schists and phyllites. Therefore, the surface of our highest mountains is covered by acidic, nutrient-poor mountain soils and acidophilous vegetation. Basic rocks such as crystalline limestones to dolomites or melaphyre can only be found at the foot of Krkonoše and in the Podkrkonoší foothills. Unfortunately, most of the operating quarries were located just there (Albeřice, Černý Důl, Prostřední Lánov, Hřiběcí Boudy, Babí, Královec or Košťálov). From the perspective of the Krkonoše landscape, it was fortunate that there were no quarries high up in the mountains, but for the maintenance of the roads this brought a very controversial situation. Thousands of tonnes of crushed basal stone was laid on the surface of the naturally acidic Krkonoše Mountains, because its source was nearby and this stone was available for an acceptable price. Unfortunately, in the 1970s the KRNAP Administration, along with other administrators of local roads, chose to repair the Krkonoše roads using the least suitable (but relatively inexpensive) geological material. It should be noted that from the road-mender's perspective, this was a very good aggregate, especially as the fine upper layer quickly solidifies when it gets wet and literally penetrates the surface of the road. On the other hand, precipitation runoff quickly leached the calcium



The stone pavement from the Labská bouda Chalet to the rim of the Sněžné jámy Cirques is evidence of sensitive work by today's mountain trail builders, following on from the traditional methods used by their predecessors (photo Jan Štursa)

and magnesium from the limestone and melaphyre, artificially enriching and changing the composition of the acidic soils around the repaired roads. Detailed monitoring of the ongoing changes showed that even relatively far from the roads (30–100 m), the calcium content in the soil was quadruple and magnesium was many times (!) higher than in clean, uncontaminated soil. This was helped by the wind, which dried the surface of the repaired routes and carried away much of the finest rock dust into the surrounding areas. Such findings were a warning for the vulnerable state of the peatbogs in Krkonoše, with their naturally strongly acidic soil environment and ecosystems. The process of eutrophication (enrichment) started rapidly and there were soon visible changes to the natural mountain communities near the roads. The words of warning from naturalists, that it was causing undesirable changes in the nature of the national park, were

futile. The management of the KRNAP Administration at the time simply gave (had to give) priority to economics before ecology.

In 1976, three experienced naturalists – Jiří Soják, Marcel Rejmánek and Pavel Kovář – published an article entitled 'Some Urgent Problems in Conservation' in the journal *Živa* No. 4/1976, with very critical comments on a number of adverse effects in the Krkonoše Mountains National Park, Tatra Mountains National Park, and in other protected areas in Czechoslovakia. I then sent the authors of this article some factual information on the current situation in the mountains to supplement their manuscript. In some peculiar way, a copy of these corrections found its way from my desk to the KRNAP Administration Director Ing Jiří Svoboda's desk. I respect him highly for his excellent management skills, which he demonstrated during the course of his directorship of the national park. At that time, however, a very stormy personal conversation took place between us, during which I almost had to leave my work in this conservation institution. Luckily, I was saved by the intervention of some members of the Scientific Council and I was able to continue working for the KRNAP Administration.

After the publication of the article, the nationwide professional discussion was so strong that there was a rapid and radical change in the technique of repairing mountain roads. On the basis of detailed chemical analyses of aggregates from various sources, a binding directive with an accurate map was prepared, to precisely define what kind of mineral materials could be used in KRNAP. For example, a strict ban on the use of crushed limestone and melaphyric rock above the upper tree line is still valid today. The technology used to maintain and repair mountain ridge trails changed significantly. The transport of thousands of tons of inappropriate crushed rock onto the mountain ridges was stopped, but the problem with the basal rock on the ridges and the wide belts affected by material washed off the roads remain. This is a long-term ecological timebomb ticking away and I personally consider this issue to be as serious as the air pollution disaster was in decades past (and in many ways still is).

Why is this so? It should be emphasised that the process of calcium and magnesium leaching is a long-term one, which cannot be stopped, and the eutrophication and subsequent changes in natural conditions will continue for at least several more decades.



Sacks containing the remaining hundreds of tonnes of limestone from the trail from the Úpské rašeliniště Peatbog below Mt. Sněžka were removed by helicopter. This demanding reconstruction in 2001 was financed by the Ministry of the Environment from the Landscape Care Programme (photo Jan Štursa)

Dozens of species of weeds, often strongly expansive, spread out from the inappropriately repaired roads on the ridges in the late 1980s. This fringe vegetation often spreads dozens of metres from the roads and Thistles, Knotweeds, Ragworts, Nettles, Dandelions, Buttercups, Willowherbs, Tufted Hair-grass and other undesirable plant species thrive here today, in place of the original mountain flora. Although the KRNAP Administration mechanically removes these weeds from the most valuable areas, it is a never ending process as the cause of the changes – tons of crushed rock – still lay on and around the roads. Given the high costs involved, inappropriate aggregates can only be removed in some places; an example being the successful project to remove the limestone from the base of the causeways and the subsequent restoration of the wooden boardwalks across the Úpské rašeliniště Peatbog (1996–1997), one of the world's important wetlands included on the Ramsar List. Several hundred metres of limestone removal here cost nearly 2.5 million CZK. Similar removals have been carried out on the trail between the Vrbatova Chalet and the Labská Chalet, or between the Luční and Obří Chalets. These removals were also extremely expensive to carry out.

Therefore, such revitalisation processes can only be justified on roads passing through exceptionally valuable natural habitats. Nevertheless, there are still dozens of kilometres of trails in Krkonoše, where it is necessary to find ways to gradually rectify the enormous mistakes of the last century.

Hopefully, the remarks (mostly meant as a joke) by our botanist colleagues along the lines of “Finally we will have such rich flora in Krkonoše, as in the Dolomites and the Julian Alps,” may offer a little relief from this dismal vision. František Janalík, the editor-in-chief of Krkonoše magazine, even promised me that he would plant Alpine Edelweiss, the floral symbol of limestone mountain ranges, in the surroundings of the unsuitably repaired roads. So that we have something to look at! He did not do so, but to the surprise of the Krkonoše botanists, after some time they found the beautifully flowering Fringed Gentian, which usually grows near the limestone quarries at the foot of Krkonoše, was now growing on the edges of several ridge trails. Its journey up to the summit areas of the mountain range had been easy, as it was obviously carried here with the crushed limestone. This beautiful plant is an exception which does not reduce the serious environmental problems, which the KRNAP Administration must take seriously.

Fortunately, in most places the building of wide mountain trails with a perfectly smooth surface has already been abandoned. The manual technique of ‘stone pitching’ the trails, which our predecessors so thoroughly mastered, is now preferred. Obviously, local materials from the surroundings of the trails are used. In particular, the Klimeš Brothers Company from Horní Maršov and some other local enthusiasts, together with the KRNAP Administration road-menders, have managed to repair and rescue many mountain pavements. They embraced the sensitive practices of earlier mountain folk and the newly repaired roads are a sign of a job well done. Much water will pass under the bridge before our society will have enough money and willing workers to enable such care for the mountain trails in Krkonoše to become a matter of course.

07

Larch Bud Moths

The largest chemical battle in the history of European national parks

At the end of the 1970s, the consequences of industrial pollution were clearly visible on the health of the Krkonoše forests. Tens of thousands of tons of industrial emissions from thermal power plants in Poland, East Germany and Czechoslovakia fell here every year. The physiologically weakened mountain spruce forests had become easy targets for insect infestations, especially of the Larch Bud Moth, a small butterfly, millions of the caterpillars of which occupied the crowns of the spruces and ate their needles. While the oldest year classes of needles dried up due to pollution, the youngest ones disappeared into the caterpillar's stomachs. It was a lethal combination of harmful processes and the foresters began to have serious concerns about the future of the Krkonoše forests. At this time the decision was made to use chemicals to suppress the calamity. It was not an easy decision and was preceded by heated debates between conservationists, scientists, foresters and ministry officials. What accompanied this drastic course of treatment? And was it at all necessary?

Despite its name, the Larch Bud Moth (*Zeiraphera griseana*, syn. *Z. diniana*) occurs as a natural representative of the insect fauna in central European mountain spruce forests. However, in the Alps, the Pyrenees, in western Europe and Siberia, the Larch Bud Moth caterpillars develop on larches and pines. In some years, the population significantly increases and in May and June the caterpillars feed intensively on needles and worsen the health of the infested trees. In the meantime, they pass through five larval stages (instars) and then abseil on silk threads to the forest floor to pupate in the leaf litter. The adults hatch in summer and the females lay eggs on twigs near the buds. These eggs overwinter in the embryo stage, with new caterpillars hatching in spring and the cycle repeating. Many factors contribute to whether there is an overpopulation calamity, or whether the population is 'normal'; it is not easy to identify a main cause of the



Spraying was primarily carried out by AN-2 biplanes, known as 'budgerigars' (photo Jan Vaněk)

calamity. There is usually a combination of factors, with the main factor in Krkonoše being the reduced resistance of the spruce forests damaged by air pollution, as well as the climatic conditions (temperature gradients, precipitation, wind speed and direction).

The Larch Bud Moth has been the subject of long-term monitoring and extensive infestations were documented in the Czech Republic several times (1925–32, 1934–35, 1956–60 and 1965–71). However, the combination of air pollution and insect damage first occurred in Krkonoše and the adjacent Jizerské Mountains in 1977. This made the situation more serious. Detailed monitoring was begun on the numbers of Larch Bud Moth eggs laid on branches, development of caterpillars and indications of the density and movement of adult moths, also using pheromone traps. The results in the dry language of numbers were: the Jizerské Mountains suffered significant damage in 1977, but an area of over 6,000 hectares, ranging between elevations of 800 to 1,100 m was also affected in Krkonoše. In 1978 the area of affected spruces in Krkonoše increased to 12,500 ha and there was a similar situation in the forests on the Polish side of Krkonoše and in the Jizerské Mountains. In 1979 the

caterpillars infested 17,000 ha in Krkonoše; together with the Jizerské Mountains, an area of c. 40,000 hectares and a state of calamity was declared on the two territories. In 1980, the Larch Bud Moth infestations in Krkonoše, which required chemical spraying even covered an area of 25,000 ha. The rapid gradation of the pest population (peaking in 1980) and the extent of damage in these four years were clearly visible, despite the long-debated and repeated chemical interventions. Interventions against Larch Bud Moths took place in Krkonoše in 1978–1983, but in the last two years the spraying was of a limited extent.

Chemical and other contexts

During insect calamities up to 1971 various chemical insecticides were used to suppress Larch Bud Moths, including DDT aerosol 10%, Dimilin 25 WP and the organophosphate Metation E 50. After the strict ban on using chlorinated hydrocarbon based insecticides, Actellic 50 EC, the efficiency of which is increased by adding low doses of the pyrethroid Ambush 25 EC, began to be used. Actellic 50 EC is not classified as a toxic substance and its residues remain for about three days. Ambush 25 EC, which is hazardous to health, has a longer residual effect, about 20 days. The selection of these substances should guarantee the minimum (but not zero!) threat to cold-blooded animals (fish, amphibians, reptiles) and relatively minor hygienic problems. Although Actellic 50 EC is not a poison, it is harmful to health, whether by direct contamination or contact with water sources. Therefore strict measures were put in place – no public access to treated forests, the buffer zones of watercourses and water supply systems were not to be sprayed. The areas of nature reserves were also excluded from spraying. On the basis of exemptions granted by the Ministry of Culture of Czechoslovakia (which was then responsible for nature protection), the interventions were planned for June in 1978 and 1979. In both years, however, the required high success rate in the chemical battle was influenced by many factors – weather (warm and dry initially spurred the caterpillar development and the subsequent rainy and windy weather reduced the possibility of using aircraft – fixed-wing and helicopters), an initial shortage of spray substances, to a large extent also communication errors during complex preparatory meetings of representatives of ministries, research institutes, government bodies etc. It would be too simplistic to state that the spraying was successful



Larch Bud Moth caterpillars (*Zeiraphera griseana*) feeding on the younger spruce needles (photo Jan Vaněk)

or unsuccessful. So after these two years, a large army of people tried to make the best preparations for the third, the anticipated peak year of calamity – the year 1980: Previous experience, detailed laboratory and field analysis of Larch Bud Moth biology, field monitoring of caterpillar development, marking air fields for precisely timed spraying and ultimately, the extremely demanding technical-organisational securing of everything which happened within a few days in June in the Krkonoše Mountains.

All of this went on behind the scenes of the third - and it can be declared as successful – chemical battle against the Larch Bud Moth calamity. Chemical spraying on smaller areas continued until 1983, when the calamity pest again became a normal representative of the entomofauna in Krkonoše. Unfortunately, the successful chemical interventions were not only directed against the inhabitants of the Krkonoše spruce forests...

Behind the environmental and human scenes of the fight against Larch Bud Moths

It should be emphasised that the repeated aerial applications of toxic chemicals took place on the territory of a national park, which enjoys the highest

status of legal protection, although at that time it was not at the level guaranteed by the current Act No. 114/1992 Coll. Nevertheless the spraying was indeed a breakthrough as regards exemptions from valid law. The KRNAP Administration Director Jiří Svoboda delegated members of the Scientific Council to take part in the complex negotiations. The scientific experts (Hadač, Buchar, Mezera, Churáček and others) strongly protested against granting an exemption from the national park statute, in particular, they argued that spraying would influence the long-term ecological stability of the spruce forests, but also of the neighbouring alpine ecosystems above the tree line. This was no act of conservatism by several professors, but about the principles for when, and under what conditions, insecticides may be used in the national park. It was about the acceptance of the priority for rescuing the gene fund (including natural enemies of insect pests), rather than the proclaimed rescue of wood mass.

The result of their initiative should have been the acceptance of an appropriate inter-ministerial decision (it was the responsibility of the Ministers Klusák and Kalina). It was necessary, during the weekend (!), to provide them with scholarly reports from the scientific front, of exactly what was unfolding in Krkonoše during these critical days. As Secretary of the KRNAP Administration Scientific Council, I was desperately trying to contact esteemed professors and associate professors across the country by phone, because

there were no mobiles or internet. We managed to do everything, but in the end the Ministry of Culture granted the exception to the application by the Ministry of Forestry and Water Management, albeit with a number of restrictive conditions on the chemical attack.

The second dimension was self-monitoring and detailed research into everything connected with the calamity and the chemical spraying. The staff of the Entomological Institute of the Czechoslovak Academy of Sciences, the Research Institute of Forest and Water Management in Zbraslav and Opočno, ornithologists, entomologists and other ecological experts were all deeply involved in the whole case. Several experts from the KRNAP Administration were also actively involved in this monitoring, despite the distinctly reserved attitude of the leadership. The problems we faced at that time were not encouraging. There was a general ban on entering the chemically treated stands, but the only chance to gather the necessary data on the effectiveness of spraying was during overflights and shortly afterwards. At that time we had to ask the security officer to issue us with protective clothing against chemical attacks, at our own risk of course, put them on, and when the aircraft flew over to take cover anywhere possible in the forest, especially under wooden bridges over streams. This was prudent because as it turned out, many people suffered mild to very serious problems from direct contact with the chemicals.

What happened next?

'After the battle everyone is a general', and I do not want to claim a patent on common sense when considering such a complex environmental case. However, the reader should know that this chemical battle did not affect only Larch Bud Moths, but the whole mountain entomofauna, including their natural insect enemies (especially the Trichogrammatid wasps, which parasitize the moth eggs and significantly influence the gradation of the pest control). Unfortunately, in windy weather some of the spray materials rose above the alpine tree line and affected the adjacent nature reserves on the Czech and Polish sides of Krkonoše.

The results of monitoring and research into the effectiveness of the chemical interventions showed that it killed off most insect groups which were in the air, in the water or on the soil surface at the time of spraying. The effects on the soil fauna were negligible, because if it does not rain during spraying, the spray substance becomes sticky and dries quickly in the crowns of the trees or on the soil surface and, fortunately, does not penetrate deeper into the soil. The reproduction capability of insect populations is huge and populations of common species in the Krkonoše Mountains recovered rapidly. However, for endangered species with small populations, such chemical interventions were existential.

No significant negative effects on the amphibian (Common Frog and Alpine Newt) and bird populations were observed after spraying. Nevertheless, there was a strikingly low nesting density of insectivorous birds throughout the area, which is related to the liquidation of insects (their main food supply). However, it must be noted critically that, especially the finances and capacities of research institutions were severely limited, making it impossible to utilise this unprecedented chemical battle in the protected nature, to maximise the scientific knowledge of all its aspects.

Another dimension of the intervention was that its main objective, i.e. the destruction of a calamity outbreak of Larch Bud Moth caterpillars and thus extend the life of the air pollution weakened Krkonoše spruce forests, was certainly fulfilled. However, a burning question remains – at what cost in the strictly controlled environment of the national park? In the following years, the Larch Bud Moth calamity was replaced by infestations of bark beetles and web-spinning sawflies, with pine sawflies or gall midges on the pine scrub. Fortunately, not only for Krkonoše, fundamental changes took place in the geopolitical organisation of central Europe, triggering a marked improvement in the approach to the environment. Nature was given another chance to recover, with the support of all the wise and far-sighted people who are not indifferent to the destiny of protected areas, and who do not follow only economic, but also environmental and moral codes of thinking and behaviour.

The Story of the Spring Anemone from Čertova zahrádka (The Devil's Garden)

**From the history of
efforts to save a single
plant species**

In the middle of the eastern Krkonoše Mountains near to Mt. Sněžka lies the mythical Čertova zahrádka, known for the high species diversity of its flora. All of the basic botanical works, which for several centuries have described the flora of Silesia and especially of the Krkonoše Mountains, contain data on the local occurrence of such gems of mountain flora, such as the Alpine Sweetvetch, Purple Saxifrage, Small Scabious, Fringed Pink, and especially the Spring Anemone. It is one of the two species of these spring herbs of the *Ranunculus* family occurring in Krkonoše. As recently as the mid-20th century, the Čertova zahrádka Garden was adorned with hundreds of flowers every year in spring, but then came the turning point. Flowering and non-flowering plants became rarer and botanists, together with conservationists, tried to figure out the reason why. The conclusions of their long-term observations are remarkable, although not very pleasing.

The only island

In our country there are only two places where this beautiful pasque flower species occurs, in the Krkonoše Mountains and at Velká Kotlina in the Hrubý Jeseník Mountains. However, its presence in the 'garden' of Moravia has not been confirmed for years and it is probably extinct in Jeseníky. Lovers of alpine flora may find it growing normally in the Pyrenees, in the Balkans, the Alps or in Scandinavia. There is even a stylised Spring Anemone on the coat of arms of Oppland County in central Norway.

We are talking about the mountain form of the Spring Pasque Flower, known by botanists as the Alpine Spring Anemone (*Pulsatilla vernalis* var. *alpestris*) and distinguished from the typical Spring Anemone (*Pulsatilla vernalis* var. *vernalis*). In the Czech Republic this is a rare flower found in pine woods and on heaths in the hill country of south and west Bohemia. However, this has become extinct at the majority of its previously known sites, with irrespon-



Who with whom? The Crow or the Anemone? Unattractive nets were used years ago to protect the Krkonoše population of Spring Anemones from hungry beaks (photo Jan Štursa)

sible gardeners responsible for the loss of its populations, as well as the appetites of certain birds, which I will mention later.

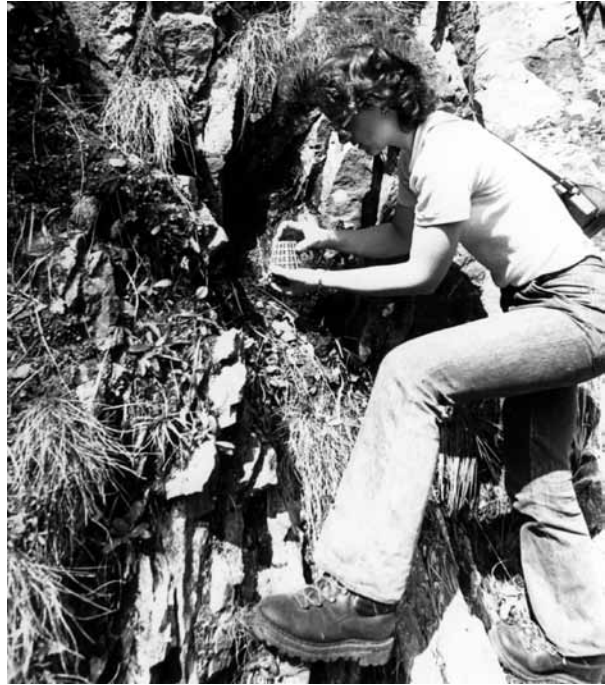
Let us return to Krkonoše, where the only site for the Alpine Spring Anemone was very well described and monitored for many years by the conservationist Colonel Josef Šourek, an expert on Krkonoše flora and the author of the famous monograph 'Flora of the Krkonoše Mountains' (1969). In 1950, he counted a total of 346 Alpine Spring Anemones and flower buds here, but only 2 flowers in 1951. In the following years their numbers rose again. The famous Krkonoše photographers Zdenko Feyfar and Jiří Havel also observed dozens of flowering plants on the site in the 1950s. But then their numbers began to decline rapidly, and from our observations in the 1960s (after the establishment of the national park), it was clear that even when the anemones produce buds in the early spring (which are founded in the late summer of the previous year and survive until spring protected by solid, partly evergreen leaves), later the buds break off. Thus the pasque flowers do not even blossom, or produce seeds, which are prerequisites for maintaining a numerically strong and healthy population. Speculation even appeared that it was the photographers who, in an attempt to make sure only they had the original photos of these rare Krkonoše plants, 'captured them on film' and then broke off the buds

and flowers. Unfortunately, a lot of people believed this rumour. I met with Jiří Havel at the time and we discussed the subject of Spring Anemone and other Krkonoše plants. I have to state in his defence that he vigorously pointed out that such practices were not in the artistic or moral codes of this well-known Czech mountain photographer. Unfortunately, by this time he was in the sights of the former party overlords and the KRNAP Administration also made his life difficult. It took a lot of persuasion, for example, for him to receive the appropriate permissions to wander through the Krkonoše nature.

Around this time several articles, focussing on the causes of the declining populations of the other (lowland) form of Spring Anemone in southern Bohemia, appeared in our protectionist media. An article aptly titled 'Cage for Anemones' described the activities of some corvine birds, which seek out the fleshy buds of anemones and eat them in early spring, when there is no other food available. This led to a successful trial using wire cages to prevent the entry of birds or other herbivorous animals. This inspired us and nets were stretched across the main population of anemones at the Čertova zahrádka in the years 1967–1969, and the KRNAP rangers (František Kolín and Herbert Berger) observed the locality closely. We also managed to find out that Hooded Crows were especially interested in the early spring offer of juicy buds, both of which confirmed the effectiveness of the protective nets. It should be noted that porphyrite rock cliff and the talus cones at the foot of the Čertova zahrádka Garden and Čertova rokle Ravine are among the first places where the snow melts in the Obří důl Valley, which is reflected in the earlier start of growth by the vegetation here. This early vegetation soon becomes of interest to various animal consumers. In those years several dozen plants regularly blossomed at the locality, but a more serious problem appeared – the collecting of their downy fruits in order to grow these attractive and rare plants. KRNAP Administration staff repeatedly found evidence of intensive harvesting of anemone fruits, while discretely collecting small numbers of seeds of endangered plant species for cultivation in the special-purpose KRNAP Administration Nursery. Indeed, at that time a supply of Spring Anemone seeds appeared in various Index seminum (published lists of species whose seeds and spores are available from some institution), for which the origin was stated – the Krkonoše Mountains (!). Amateur botanists, who wanted to have such a rare and famous plant in their herbarium, also contributed



One of dozens of young Spring Anemone seedlings, grown in the gene fund bank and transferred to the natural environment of the Čertova zahrádka. Planting out, and later sowing of seeds, were the subjects of detailed monitoring intended to find out how successful our efforts to save the Spring Anemone from extinction using these methods were (photo Jan Štursa)



Irena Špatenková planting Spring Anemones at Malá Čertova zahrádka (photo Jan Zámeš)

to damaging this single Czech locality. It was not possible to guard against their occasional unauthorised visits and the irreversible damage they caused to the plants, as an item collected for the herbarium mostly meant fatal damage to the base of the plant with no chance of its regeneration. The anemone is a typical hemicryptophyte, a plant whose growth-refreshing buds - covered with remnants of scales, and old leaves, are located just above the ground. Hooded Crows, seed collectors, herbarium collectors, irresponsible rock gardeners and also the rapid onset of industrial pollutants that endangered the spruce forests, as well as other parts of the natural environment in Krkonoše - all of these factors combined to accelerate the population of Alpine Spring Anemone into a state of genetic collapse, with the number of plants rapidly declining, not flowering, and therefore not providing opportunities for natural regeneration. In addition to this, in 1974 the remaining native plants were heavily damaged by landslides during summer rainstorms. Without specialist care the Alpine Spring Anemone was headed for the sad fate of extinction.

Rescue efforts

At this time, the next phase of targeted care for this population of critically endangered Krkonoše plants began. In appropriate conditions and taking into account all the essential principles of work with genetic material, we tried to grow on young seedlings, which could gradually be replanted at the original locality. The KRNAP Administration welcomed the opportunity to obtain genetically original mother plants of the Spring Anemone from the garden of the former President of the Pec pod Sněžkou Municipal Council Mr. Gláží. He had once asked Colonel Šourek to take charge of the cultivation of these rare plants, and together they collected several fruits. After years we had the opportunity to bring anemones of guaranteed Krkonoše origin from Mr. Gláží's garden in Pec pod Sněžkou to the KRNAP Administration's Nursery. It was not at all easy to learn how to grow this alpine plant in the foothills of the Krkonoše Mountains, where completely different climatic conditions prevail. In order to appropriately modify the microclimate,



Alpine Spring Anemone (*Pulsatilla vernalis* var. *alpestris*) – a critically endangered jewel of the Krkonoše flora (photo Jan Štursa)

the plants had to be regularly misted and shaded, watered with water of a suitable chemical composition, and planted in an appropriate substrate. We also needed to prevent unwanted pollination of flowers (anemones are pollinated by insects) and the possible interbreeding with other anemones, which were then grown in the nursery for commercial purposes. But the efforts were successful and in 1982–83 more than 100 young seedlings from Vrchlabí were planted at different places in Čertova zahrádka. Initially, our efforts were successful and the young plants thrived in their new habitats, but unfortunately within the following decade, the vast majority of the anemones gradually died. The reasons were varied, as young plants planted in some places dried out, while in other places they could not stand excessive moisture, grazing animals (birds, rodents, molluscs), landslides, trampling due to unauthorised entry of tourists, photographers and climbers, but also the long-term changes to the Krkonoše nature as a result of the pollution load (the chemistry of precipitation, changes in soil chemistry and subsequent gradual change in the composition of

plant communities, especially the increasing grass coverage). In recent years, the influence of considerable volatility of weather, in the context of ongoing climate change is beginning to show in some species of mountain flora. Most likely there are also other, as yet unexplained, reasons for the high failure rate of our long-standing efforts to save this jewel of the Krkonoše flora.

Although this species is still grown in the KRNAP Administration gene bank and the battle to save this critically endangered species of the Czech flora growing at its single Czech locality is still ongoing, the future for the Spring Anemone is very uncertain. Entry to this part of the national park is strictly prohibited for the reasons outlined above, so each of us can contribute to the success of long-term efforts by KRNAP Administration experts, by fully respecting these unpopular restrictions on admission. Indeed, the site is located in the First Zone of Krkonoše National Park and the unique nature of these parts of our highest mountains should only be observed from a safe distance on the hiking trails.

Mt. Lysá hora

Using the salami method in nature conservation

The dominant of eastern Krkonoše, Mt. Sněžka, is the highest mountain in the whole High Sudetes range. In the western Krkonoše Mountains, however, despite its lower elevation, its competitor from the landscape and historical perspectives is Mt. Kotel or Kokrháč (1,435 m). This passes in a westerly direction into the Lysá hora massif, which reaches an elevation of ‘only’ 1,344 metres, but dominates the famous tourist resort of Rokytnice nad Jizerou. Mt. Sněžka and Mt. Lysá hora have one thing in common – in the history of Krkonoše National Park they are both very controversial areas in which many years of conflicts over their exploitation have taken place. The fates of the two peaks are classic examples of strategies using the ‘salami method’ to resolve differences of opinion about the use of nature and landscape.

Bald history

The term ‘salami method’ describes the tactics when controversial or difficult targets, solutions and requirements that are generally difficult to enforce, or would have been completely impossible, are divided into small component steps, and these are implemented gradually. The term is often used in economics, transportation, politics, and more recently also increasingly in the environmental sphere (e. g. the promotion of highways and various linear structures or the development of sports and recreational facilities).

The protectors of the Krkonoše nature are faced with this strategy quite often, despite the highest legal status of the national park. In the case of Mt. Lysá hora in western Krkonoše, ideas and opinions on how to utilise this mountain massif reasonably, while effectively protecting its natural and landscape values have been nurtured for decades. The adjacent Kotelní jámy pair of glacial cirques was already declared a nature reserve in 1931. During the first stage of preparing for the Krkonoše National Park in 1952, 8 Strict Nature Reserves were declared (among them were again Kotelní jámy) and two partial reserves



No bulldozers and graders were used to move soil and rocks from one end of the ski slope to the other end. After the tree stumps were dynamited out, the members and supporters of the Spartak Rokytnice club sensitively smoothed the surface of the new ski slope using rakes and wheelbarrows before grass seed was sown here (photo Jan Štursa)

called Východokrkonoská (Eastern Krkonoše) and Západokrkonoská (Western Krkonoše) Controlled Nature Reserve (later renamed Prameny Úpy and Prameny Labe SNRs). They regulated the usage of the territory above the upper tree line in Krkonoše, including the Lysá hora massif. In the post-war period the Krkonoše Mountains have experienced a mighty onslaught of visitors, growing numbers of mountain chalets and accommodation capacity, and the new mass character of winter sports. Sustainable usage of Krkonoše required strict rules. Therefore, a graduated protection regime for the territory of national parks was introduced, along with an accurate list of what may and may not be done at specific locations in the NP.

It took until the middle of the 20th century before Mt. Lysá hora experienced its first concerted onslaught of skiers. At this time the first ski slope was built on its slopes, which was later maintained by the members of the newly-created Spartak Rokytnice Sports Club (1952). Thanks to them the currently popular Rokytnice ski area was born. The initial simple winch and sled for ten people was eventually replaced by a slightly better ski tow to the summit of Lysá hora. At that time the surface of the downhill slopes were smoothed by the crew of skiers trampling them. The pioneering transporter survived until 1963 and was replaced by the first anchor ski tow in 1965, with

a second one built shortly afterwards. A ski lift, measuring almost 1,200 m, was built in 1968. The construction of the new ski slope from the summit of Lysá hora to the lower station of the ski lift was also begun in 1968 – creating a 3,200-metre-long downhill racing slope with an elevation difference of 680 m. The surface, stabilisation and grassing over of the ski slopes demonstrated the very sensitive approach by the members of Spartak Rokytnice to taking care of the environment of Mt. Lysá hora. In the 1970s the VL 1000 ski lift was extended by 300 metres to a point just below the summit. At the end of 1996 the ski tow from Hoření Domky to the summit of Lysá hora was replaced by a new four-seater Doppelmayr chair lift with a length of 2,200 m. As the upper section of the chairlift reached into the strictly protected First Zone of the NP, a mutually accepted compromise stipulated that its operation would be restricted to the winter months, and only when there was sufficient snow cover. During the following years various technical modifications were made to the transportation facilities and slopes, including installing technical snowmaking equipment.

This is a concise summary of the development of this popular winter downhill ski resort in western Krkonoše. This short list of facts hides at least four tumultuous decades of discussions and disputes, political and economic pressures, concessions, the



A well maintained, grassy surface of the ski slope in the summer is a prerequisite for a quality snow surface in the winter season. The downhill piste from Mt. Lysá hora is one of the greenest downhill slopes in Krkonoše (photo Kamila Antošová)

resignation or compromising of several garnitures of KRNAP Administration and Ministry of Environment employees on the one hand and of the municipality of Rokytnice nad Jizerou and Spartak Rokytnice on the other hand. The years of negotiations between all interested parties is illustrated by a pile of official documents more than one metre high. Only their detailed study offers plenty of reasons why the subtitle of this article is justified.

The efforts by every winter sports resort to gradually develop and enhance the quality of services offered is understandable, especially in today's economically profiled society. This is certainly true in the case of Rokytnice, but with the extra provision that the development of this resort should respect the existence of Krkonoše National Park and ecological limits, or

certain restrictions, on the use of its natural environment. Such limits for development cannot be modified after every national, regional or municipal election. These limits relate to the carrying capacity of the natural environment in the NP, which we want to protect and use in a sustainable manner, rather than exploit. In the early 1990s the main topic of debates in the Krkonoše Mountains was the project by the French company Sectra, which wanted to use PHARE programme funds to build a network of ski lifts to horizontally link the major Krkonoše ski resorts. For example, the Rýžoviště resort at Harrachov was to be linked with Rokytnice over Mt. Plešivec and Mt. Lysá hora. Similar connections were proposed between the resorts in eastern and central Krkonoše. For the intimate Krkonoše Mountains, however, these links represented such a fundamental impact on nature and landscape (regardless of the economic risk) that the project was rejected. Therefore, the individual Krkonoše resorts sought their own solutions for developing downhill skiing in their ski centres.

The crash of the chairlift

The representatives of the municipality and Spartak Rokytnice presented a study for the development of the sports and recreational centre to the KRNAP Administration and in particular, they tried to gain permission to replace the ski tows with a high-capacity chair lift.

After complex negotiations, they were able to reach a mutually acceptable compromise solution and obtain an unprecedented exception to allow the construction of cableways below the summit of Lysá hora – in the First Zone of the national park, from the Ministry of Environment. The exemption contained many conditions for the protection of nature, which accurately defined the methods of technical realisation of the construction and the conditions for operating the chairlift. The facility with an hourly lift capacity of 1,800 persons was only to be operated in the winter, and only when there is sufficient snow depth, to ensure that no damage is caused to the dwarf pines or the arctic-alpine tundra in the summit section of Mt. Lysá hora. In times with a shortage of snow only cross-country skiers should be transported, while snowboarders should be strictly excluded. The construction of the chairlift was carried out during the term of office of Mayor Procházka, who chose



If it is a good season with sufficient snow cover, the four-seater chairlift transports up to 1,800 persons per hour towards the summit of Mt. Lysá hora (photo Kamila Antošová)

to obtain the necessary funds from a multi-million-crown loan. However, it only took two winters with below average snowfall, when the chairlift traffic was almost zero, for the owners and operators of the sports and recreational area in Horní Rokytnice to fall into financial crisis due to the loan repayments. Rokytnice was soon one of our most indebted municipalities, which unfortunately led to strong pressure on the KRNAP Administration and the Ministry of Environment to change the conditions of the aforementioned exception and allow year-round operation of the chairlift from Hoření Domky to below the summit of Mt. Lysá hora.

This was completely unacceptable for the protection of nature, as it would result in an influx of thousands of tourists to the First Zone of KRNAP

in places where no marked tourist trails or summer paths existed. The only route between the upper station of the chairlift on Mt. Lysá hora, across the saddle to Mt. Kotel, was an old footpath used before World War II during the construction of border fortifications, and once more when replacing the ski tow with a ski lift and the construction of its upper station. Undesirable damage to the terrain and the dwarf pine vegetation had already occurred. Nevertheless, the scars have been gradually removed and the original tundra vegetation is quickly recolonising the surface of the path. Rokytnice had a study commissioned, in which the author tried to refute the conservationists' concerns about the escalation of tourists and subsequent burden on the First Zone in this part of Krkonoše. Among the rather demagogic arguments and proposals included

in the study were the construction of a boardwalk, increased protectionist supervision, regulation of summer passenger transport, the necessary dispersal of visitors, raising awareness, etc. These proposals were rejected, but the endless negotiations over access to the slopes of Mt. Lysá hora have continued. The representatives of Spartak sought any feasible ways to be allowed to operate the chairlift in summer; a request to change the zoning of the Lysá hora massif was made, a series of appeals against the rejections by the KRNAP Administration were also made, which were gradually dealt with by several Ministers of the Environment (Messrs. Kužvart, Ambrozek, Bursík, Chalupa). The controversy over the fate of Mt. Lysá hora was even discussed in Parliament. Even former President Klaus has expressed his opinion on the case, but this mirrored his warm relationship with skiing and his extremely reserved relationship with nature conservation and ecology.

The search for a compromise between the KRNAP Administration and the owners and operators of the Rokytnice skiing complex carried on. The next in a long line of slices gradually cut from the salami was the addition of a snowmaking system, where the original request for mobile equipment which was removable during the summer, was followed by a request for permanent equipment. The KRNAP Administration agreed with the snowmaking, despite the related environmental risks. We strictly refused to allow snowmaking on the slopes above the Harrach Trail, where the dwarf pine scrub and arctic-alpine tundra were already breaking down. Any change in the natural snow distribution in these areas would be an unacceptable interference with the natural conditions. Rules have been adopted in recent years to allow disciplined snowboarders to use

the Rokytnice ski slopes. The behaviour of the ski slope users is now monitored by KRNAP rangers and ski patrols made up of employees of the ski area.

The pressure for year-round operation continues. In the spring of 2011, Minister of the Environment Chalupa even received a three-thousand-signature petition requesting the introduction of summer operations of the chairlift to Mt. Lysá hora. The issue of Lysá hora has become an evergreen over the years at meetings of the Scientific Section of the KRNAP Council. Its members believe that the very existence of chairlifts and ski slopes including associated activities on Lysá hora, i.e. in the First Zone of the national park is the result of the accommodating and compromise approach by the KRNAP Administration towards the town of Rokytnice nad Jizerou.

The Administration had a study produced to assess the effects of different variants of future access to the slopes of Mt. Lysá hora on its natural environment, as it is part of the Natura 2000 network – the Krkonoše Site of Community Interest and the Krkonoše SPA-Bird Area. The Scientific Section also recommends that the KRNAP Administration require the operator of the chairlift to Lysá hora to justify why, during the reconstruction of the chairlift, they did not agree to the Administration's proposal to build a new chairlift station on the Harrach Trail, which would increase the chances of finding a common solution to possible summer operations.

Honestly, I do not dare to utter the prognosis for future development in the case of Mt. Lysá hora. As a natural scientist, I believe that everyone involved in the many years of disputes will eventually adopt a common vision of the least intrusive form of exploitation of the vast natural potential that this part of the Krkonoše mountain ridge offers us.



The summit of Mt. Lysá hora from the slopes of Mt. Kotel. Mt. Ještěd in the background (photo Jitka Kopáčová)

10

Dwarf Pine versus Mat-grass

**Two perspectives
on the story of the
Krkonosé tundra**

Not only people but also plants, animals and their communities have their biographies. The fate of many flora species in Krkonosé is not only remarkable, but often seemingly contradictory. From time to time, this is reflected in the stormy debates between experts on how to assess the role of some organisms in the mirror of time. In connection with our ever more detailed knowledge of the remarkable arctic-alpine tundra phenomenon, bitter disputes have been going on for many years over the correct interpretation of the fates of two of the many tundra players – Dwarf Pine scrub and Mat-grass (*Nardus*) meadows. Much has already been written about it, especially in the context of the gradual thinning out of the Dwarf Pine scrub on the Krkonosé ridges. A little reflection on the biography of the pine scrub and the grasslands, both of which contribute significantly to the face of Krkonosé, would definitely not hurt.

Two players

It is not necessary to introduce the Dwarf Mountain Pine (*Pinus mugo*) to visitors to the Krkonosé Mountains. These tough, modest and crooked bushes can be found in open, or dense and closed growths of dark green alpine scrub vegetation above the tree line, at elevations of 1,200–1,450 metres and occasionally higher. The Dwarf Mountain Pine is a native tree species in the Krkonosé and Jizerské Mountains and the summit areas of the Šumava Mountains, unlike in the Hrubý Jeseník range, or the Orlické and Beskydy Mountains, where it was planted in the past. It is a natural part of the montane flora of the Alps, the Carpathians and the Pyrenees, but occurs there in a somewhat different variety. In the mountain chalet farming period (18th–19th century), the area of dwarf pine growths in Krkonosé was reduced in connection with the expansion of pastures and hay meadows above the tree line, as well as the use of its wood for fuel.

The second protagonist of our story is Mat-grass (*Nardus stricta*). It forms extensive, low Alpine grasslands, where it



Despite being called the 'Hercynian Desert' the Krkonoše ridges play host to a variety of species, and in late summer, a colourful mosaic of montane grasses and shrubs. An abundant flora of alpine and arctic mosses, lichens, algae, blue-green algae and fungi thrive on the rocky soils (photo Jiří Bašta)

grows alongside other montane grass species – Wavy Hair-grass, Tufted Hair-grass, Hairy Small-reed, Bent Grass, Fescue, Moorgrass and Bigelow's Sedge. Just like the dwarf pine, mat-grass also prefers positions above the alpine tree line, but we may often meet it in lower mountain areas and in the foothills. During the formation of the European flora, mat-grass occupied extensive areas of the Alps, Pyrenees, Carpathian and Balkan Mountains, before spreading across central and western Europe and as far as Scandinavia. It is especially abundant in mountainous areas where animals were grazed for centuries. The mountain folk (as well as herbivorous animals) do not like it too much because its nutritional quality is significantly worse than other mountain grasses and herbs. Botanists, farmers, but also foresters, historians and ethnographers, have long been closely involved in trying to gather as much knowledge as possible about the role of this grass in the life of montane nature and in the fates of the mountain folk.

The Krkonoše Mountains are an example of this, as for many years an almost 'ideological' dispute

has raged between experts over both species and their communities, over the origin of species-poor *Nardus* grasslands on the Krkonoše ridges and over whether the dwarf pines or mat-grass were there first. The figurative designation of Krkonoše as the 'Hercynian desert' describes the species-poor *Nardus* grasslands, in comparison to the much richer alpine or carpathian meadows or the flower-rich meadows on the lower-lying treeless enclaves in Krkonoše. One group of experts believe that *Nardus* grasslands (sometimes inappropriately referred to in Krkonoše as 'bare mat-grass'), spread across the Krkonoše ridges to replace the burned and uprooted dwarf pines, gradually forming the currently extensive and, in their interpretation, secondary growths. Other experts, however, are convinced that a significant portion of (the question is how much?) the Krkonoše *Nardus* grasslands are natural plant communities, differentiated in their species diversity, and their long-term development, from the *Nardus* grasslands in the Alps or the Tatras. The botanical composition of *Nardus* meadows on the



Dwarf Pine has been a native species in the Krkonoše flora for thousands of years. The longevity and age diversity of their growths is due to the ability of the older branches to grow roots and to spread vegetatively to the surroundings, in addition to the natural generative renewal of pine scrub from seeds. Thus, the natural dwarf pine growths have a wide age differentiation, which increases their viability. (both photos Jan Štursa)



Renewal of the scrub growths which had been removed in the past was carried out in the 20th century according to ten-year plans. Therefore, the newly-founded growths are relatively even-aged in character (even if we do not consider the very unnatural borders of the plantings). The even-aged character of these new dwarf pine growths was one of the weak points in the arguments supporting high-mountain afforestation. The young scrub growths also suffered increased pressure from insect infestations

Krkonoše ridges demonstrate their affinity with *Nardus* grasslands in the north of Europe, e.g. in the Norwegian Jotunheimen and Hardangervidda mountain ranges, where this particular Nordic type of mountain meadow was first described by science. It is only one of the small fragments in the mosaic of knowledge of contemporary scientists, who consider Krkonoše's mountain ridges to be a central European outpost of arctic tundra. Their arguments are based on evidence derived from the long-term formation of the unique phenomenon of the Krkonoše arctic-alpine tundra, i.e. an environment that formed long before the Krkonoše ridges began to be influenced by man. He only wandered here and began farming in modern times, only a few centuries ago, whereas the repeated blending of nordic and alpine nature on the Krkonoše ridges took place from hundreds of thousands to tens of thousands of years ago. Proponents of the opinion that the *Nardus* meadows in Krkonoše are (mainly) of secondary origin build their arguments on detailed studies of archival evidence about the lives of the former mountain folk, data on the extent of removed dwarf pine vegetation, wood consumption, the number of chalets, animal husbandry and cultivation by their respective owners. The documented system of usage of hay meadows and pastures strengthens their views on how mat-grass behaved before, during and after the farming of the Krkonoše ridges.

When the Krkonoše landscape suffered severe floods and landslides in the 19th and 20th centuries, the first plans for reforestation of parts of the ridges with dwarf pines, in order to improve local water and soil conservation conditions, were promoted. One of the causes of natural disasters, among others, was the gradual removal of dwarf pine vegetation in the mountain chalet farming era, on an area of approximately 1,000 hectares. The reforestation work was initiated by Count Jan Harrach in several stages, which continued until the second half of the 20th century, with dwarf pine planted on an area of almost 850 ha. This was particularly successful after World War II, because it was based on the knowledge and practical experience of foresters (Ing. Theodor Lokvenc) and Forest Drainage workers (especially Messrs. Vaculík and Kříž). After the declaration of Krkonoše National Park in 1963, the NP Administration staff had the opportunity to review the plans submitted by the ten-year development plan for high mountain afforestation. They especially tried to prevent the reforestation of peat-bogs, fen sites and localities where rare or endangered plant species occur. Even at that time certain errors were made and the author has to honestly admit that, along with the head of the Conservation Department Mr. Vladimír Šatný, he misinterpreted several numbers from the Forestry Department, thus inadvertently agreeing with reforestation of the northern slopes of Mt. Studniční hora in places

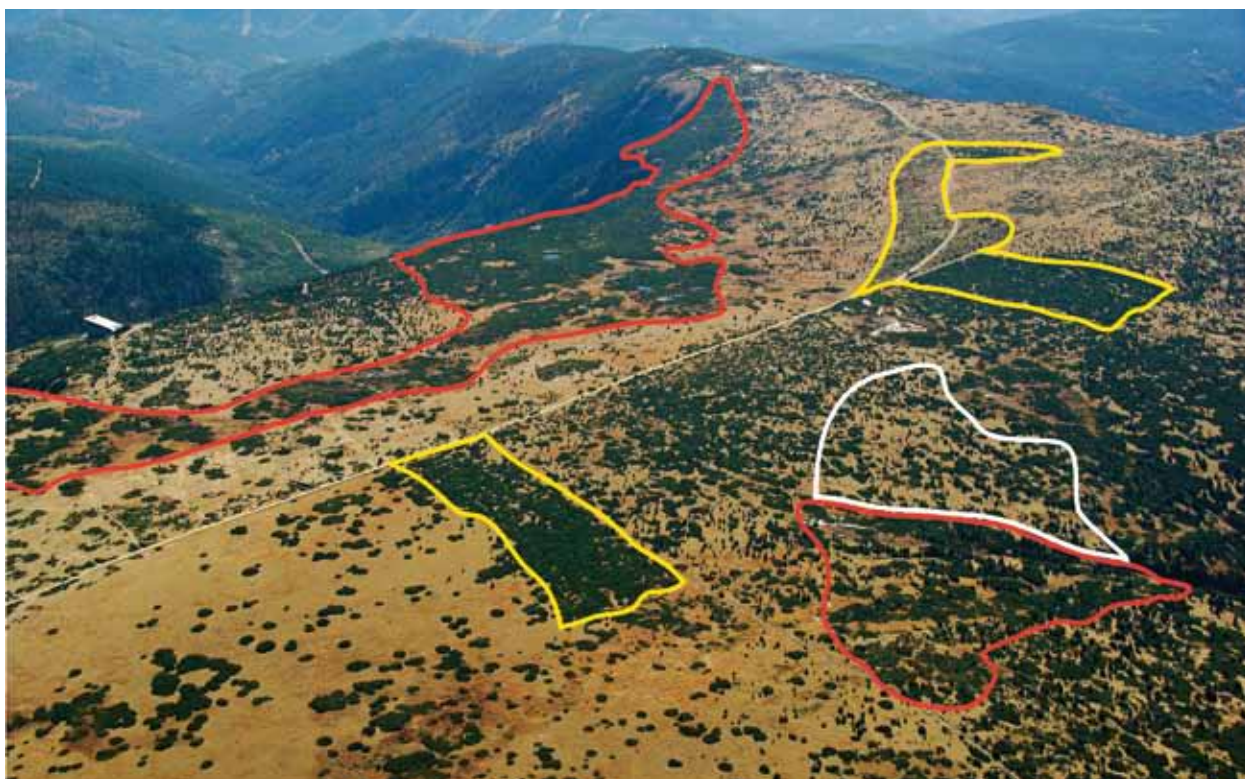
with unique tundra communities. Various errors and inconsistencies also piled up during the afforestation work in the harsh climate on the Krkonoše mountain ridges.

With the deepening of scientific knowledge about the unique environment of the Krkonoše arctic-alpine tundra, it is increasingly clear that many of the areas should not have been afforested, and the dwarf pines planted there could also cause the gradual extinction of other highly valuable natural phenomena in the National Park. The growing young dwarf pine seedlings are increasingly influencing the microclimatic conditions in the afforested areas. After several decades, closed dwarf pine growths form and shade the surroundings, from which heliophilous montane flora and fauna species eventually disappear. These growths also modify the snow cover distribution and the process of its melting, as well as reducing the fluctuations between daytime and nighttime temperatures. These

fluctuations are one of the basic prerequisites for the formation or 'survival' of various frost landforms, for which the Krkonoše mountain ridges are so famous in the context of the whole of central Europe.

Cut it down or let it grow?

Differences of opinion raged in the 1990s, with the scientists demanding the removal of dwarf pine from such localities, while on the contrary, the foresters rejected this (because in the forestry 'Ten Commandments', the use of saws or axes on the dwarf pine is an unforgivable sin). Both sides stood by their arguments, the discussions moved to the KRNAP Administration Scientific Council's meetings and to the Ministry of the Environment. Several major research projects have taken place here in which geomorphologists, pedologists, hydrologists, botanists, foresters, and historians have tried to find solutions



This aerial view of the western Krkonoše montane plateau documents the variety in the mosaic of natural and introduced dwarf pine growths and alpine grasslands. Certain areas of densely packed dwarf pines from various plantings in the 20th century are marked in yellow. The red lines mark the natural dwarf pine growths on the arctic peatbogs and around the rims of the glacial cirques. The areas marked in white may serve as models of a balanced mosaic of dwarf pine growths and alpine forest-free areas in the Velká Mušlava spring area. A belt of planted dwarf pine, which was thinned out by the KRNAP Administration, lies above the lighter line of the tourist trail (photo Kamila Antošová)



The caterpillar of the Common Pine Sawfly (left) or the larvae of the Gall Midge *Thecodiplosis brachyntera* (right) are among the natural representatives of the insect fauna in the dwarf pine growths. In some years they over-reproduce, but the Krkonoše dwarf pine growths have always managed to deal with this problem. The statute of the national park and the protected area of natural water accumulation (CHOPAV) forbid the use of chemicals in such areas (photo Jan Štursa)



The peculiar heather-covered hillocks on the Krkonoše ridges are caused by the long-term effects of frosts and ice (cryo-processes) on the microrelief of the mountains. However, the precondition is that there must be a sufficiently large alpine natural forest-free area, or at least an optimal spatial mosaic with the dwarf pine growths (photo Jan Štursa)

for how to objectively assess the whole complex phenomena of the Krkonoše arctic-alpine tundra and how to care for it in an optimal way. Where should the subject of the protection and care be the dwarf pine growths, and where should it be the unique tundra communities of plants and animals, frost-sorted soils or the variety of processes conditioned by active solifluction, wind deflation, or snow erosion? An intensive comparative study of Krkonoše and the Scandinavian tundra brought much knowledge, on which the KRNAP Administration's care for the Krkonoše tundra is based. Indeed, both ecosystems benefit from increased protection as Sites of Community Interest under the Natura 2000 network, and are also among the 'star' habitats (i. e. habitats or ecosystems, the strict protection of which is monitored by the jurisdiction of the European Union).

The health of the dwarf pine growths during the late 20th air pollution calamity deteriorated considerably. There has been a gradual reduction in the number of needle age classes, and of seed germination rates,

as well as signs of tracheomycosis and weakening of the pines, caused by the increased consumption of needles during repeated infestations of naturally herbivorous insects, especially pine gall midges or pine sawflies. Thanks to its high resistance, the dwarf pine survived the calamity and continues to prosper on the Krkonoše ridges. Due to the much greater knowledge, the other phenomena of the Krkonoše arctic-alpine tundra are now under much stricter tutelage of experts. The future of this unique environment on the Krkonoše mountain ridges, where dwarf pine and mat-grass play equally important and irreplaceable roles, depends on the substantive discussion, supported by rational arguments, and the consequent actions. It depends on the correct evaluation of the spatial mo-

saic of ecosystems which the two protagonists of this article create, and on how the KRNAP administrators can provide the best care for the tundra environment.

Public awareness is equally important, which was confirmed by the impassioned reaction of numerous visitors to the mountains when they saw the pruning of dwarf pines in 2010. Patient explanations of what the KRNAP Administration was doing on the mountain and why, and the usage of appropriately chosen words and arguments, must also be in the arsenal of skills of the KRNAP staff, if we do not want the dwarf pines in Krkonoše to cause such bitter disputes as those over the bark beetle calamity which have plagued Šumava NP for the last 20 years.



Dwarf Pines on the scree on Mt. Luční hory (photo Kamila Antošová)

11

White and Green Ski Slopes

Behind the scenes of the Krkonoše skiing paradise

Despite their intimate size, the Krkonoše Mountains boast the largest offer of services for winter sports fans of all of our mountain ranges. There are 20 downhill skiing resorts and 141 km of ski slopes in operation on both sides of the mountain range. Two dozen ski lifts, together with nearly 130 ski tows, can carry up to 120,000 people per hour from the valleys to the mountain slopes. The climatic conditions in Krkonoše guarantee excellent snow conditions, which are now supplemented by snowmaking technology. For nearly five months, the mountains become a skiing paradise for hundreds of thousands of domestic and foreign skiers. The operation of ski resorts provides the main component of income and profit for all entities offering services in the winter tourism sector in Krkonoše. However, Krkonoše has been a national park for half a century, so the current high quality tourist and recreational infrastructure is the result of years of discussions, disagreements and compromises by both sides on the possibilities, methods and limits for the sustainable use of our highest mountain range.

Terrain for alpine disciplines

When the first skiers appeared here after 1890, few knew what an era of stormy development Krkonoše had in front of it. What was originally the practical equipment of forestry staff soon took over as sporting equipment. Winter tourism experienced its initial boom at the turn of the 20th century, when organised skiing clubs were formed and the first regular ski races were organised on the Czech and Silesian sides of the mountains. At the time Jilemnice turned into the cradle of Czech skiing, as is richly documented in the 'White Trails' permanent exhibition at the local Museum of Krkonoše. Construction of ski infrastructure began to change the winter face of Krkonoše. Winter pole markers were introduced along the mountain ridges, greatly easing the safe movement of skiers in Krkonoše. The first ski jumping ramps were built



The ski area at Mt. Medvědíň was hidden in the deep forests – before the cancerous work of poisonous industrial air pollution began. Most of the slopes around the ski slopes were deforested during the 1980s. More radio transmission masts have been built on the hilltops (photo Jan Štursa)

in the major centres on both sides of the mountains and alongside cross-country skiing, downhill skiing enjoyed increasing popularity. Krkonoše was already an important centre for winter hiking and skiing before World War II, which was reflected in the amenities of the main centres – Špindlerův Mlýn, Harrachov, Rokytnice nad Jizerou, Janské Lázně, Pec pod Sněžkou, along with Szklarska Poręba and Karpacz on the north side of the mountains.

New slopes were added in the second half of the 20th century and their increasingly dense network interfered with the integrity of the forests on the mountain slopes. Some downhill skiing resorts were created relatively sensitively (e. g. the Rokytnice area on Mt. Lysá hora), but other operators were not as respectful towards nature. An example could be the genesis

of the popular complex at Medvědíň. This project first appeared on paper in the mid-1960s, with the building of the ski lift, removal of forests from future ski runs and basic ground levelling works starting in 1965. According to oral reports, leaflets inviting skiers to a new site were already being distributed abroad, but for another 10 years there was only a construction site here – the ski lift to Mt. Medvědíň first ran in 1975. The insufficient stabilisation of the surface of the deforested ski slopes and the long-term postponement of their grassing over led to the emergence of deep erosion furrows and gullies, meaning that future biotechnical modifications required considerable effort and finance. For many years after the start of operations the surfaces of the ski slopes were still in poor condition, which was worsened by the undesirable movement of vehicles



Detail from Mt. Medvědí: well- and badly-stabilised edges of the downhill ski runs. Slippage of rocks and collapses of the upper edge of the lateral slopes mean that their stabilisation takes many years to complete. This instability also complicates the maintenance of the ski slope and its safety in the early spring (photo Jan Štursa)

in the summertime. Further damage to the slopes at that time was caused by the skidding of timber from the neighbouring forests across the already spontaneously overgrown slopes. The situation in Medvědí, in Svatý Petr or on Hromovka only improved after the Špindlerův Mlýn Ski Resort Company began to implement modern year-round care for these skiing centres. The contemporary organisation of various



Insufficiently stabilised slope of the 'Great Drum' on the black ski slope at Svatý Petr during modifications in the 1970s (photo Jan Štursa)

mountain bike races on the ski slopes is not without damage to the vegetation and young forest stands at their edges, not to mention the operation of permanent downhill biking trails. Each year a number of the Krkonoše ski slopes are unnecessarily disturbed in this way, which disrupts the natural process of stabilisation, unfortunately making the winter surface treatment of the pistes more difficult (and more expensive), and is reflected in increased accident rates. Generally, the smaller the transport and overlaying of rocks and soil during building or modifying subsequent ski slopes, the easier it is to stabilise them, plant them with grass and reduce the extent of winter maintenance. Because ski slopes are not only white, they are also green for more than half the year, but this is only true if we are willing to take proper care of them.

The mountain forests in Krkonoše started to die off as a result of air pollution load from the 1970s onwards. The process of forests drying up, along with insect calamities (Tortrix, bark beetle, spinning sawfly), progressed quickly to any open walls of forest. These did not avoid the edges of the ski slopes, in no small part contributed to by the fragmentation of the forests and their reduced ecological stability, not to mention the undesirable impact on the integrity of the populations of many animal species. Then strips of dry dead trees began to spread along the ski slopes. This in turn intensified the efforts of ski resorts to cut these trees down and easily achieve greater width and quality parameters of the pistes, especially in connection with the ever more modern equipment and increasing speed of descents. This led to tough

negotiations about each hectare of forest. At the time of escalation of the air pollution load (1985), a resolution not to initiate the construction of sports facilities in the Krkonoše Mountains which required deforestation and forest occupation, was even published by the former County Party Committee and the Council of the East Bohemian Regional National Committee. When the air pollution calamity began to recede, the disputes flared up again, especially on the upper part of the Mt. Medvědí slopes or on Mt. Čertová hora. The present day views of the slopes near Svatý Petr, Mt. Medvědí, and Mt. Čertová hora or Mt. Černá hora indicate the enormous extent of forest annexation for the benefit of downhill skiing. The discussion has recently started to apply the concept of landscape character. The earlier ski slopes designed with curves leave relatively mild scars on the face of the mountain landscapes. These pistes are partially hidden in the once again maturing young forest stands and do not disturb the landscape character as drastically as the 100-metre-wide downhill slopes which directly follow the fall line (e.g. Stoh, the racing slopes in Svatý Petr or in Harrachov). Unfortunately, the straightening of ski slopes was supported in particular by demands for increased skier safety.

Problems with grass

The rapid stabilisation of deforested slopes, their perfect transverse drainage and planting with grass is in the common interest of ski resorts operators as well as conservationists. This, however, concealed another environmental problem that the ordinary skier – in contrast to the national park administrator – had absolutely no idea about: How, when and with what to successfully clean up and grass over the slopes stripped of vegetation? The national park statute does not permit the introduction of any non-native organisms, but the only commercially available seeding material commonly includes cultivated grasses (Red Fescue, Creeping Bentgrass, Ryegrass, etc.). Using such seed mixes greatly increased the potential risk of genetic corrosion of the native Krkonoše flora in the form of spontaneous hybridisation between natural and related cultivated species. Over time the KRNAP Administration has managed to convince the managers of ski slopes of the benefits of mulching, but even this is not risk-free. Especially when some of the ski slopes began to be mulched with manure from farmers in the foothills. This brings undesirable



View under the chairlift at Mt. Medvědí across the Špindlerův Mlýn valley towards Pláň and Hromovka. The lines of the downhill ski runs and chairlifts unfavourably influence the landscape character of the montane panorama. The meadow enclaves or reforested clearings never divided the forests with contiguous belts, but always created a mosaic pattern (photo Jan Štursa)

nitrophilous plants to the slopes, which slow down the process of natural vegetation renewal, and spread from the slopes to the surrounding forests or grasslands. Therefore, the KRNAP Administration has prepared a useful booklet on the optimal way of planting on areas treated to remove vegetation cover. It provides many helpful hints on how to proceed with biotechnological work in the Krkonoše NP.

The development of new technologies and the understandable interest of operators in having the longest ski season started another long-debated topic – the production of artificial snow. This brings considerable changes to the natural conditions in the mountain environment, especially in terms of vegetation. Greater compaction of snow cover, poor soil aeration, changes in the water regime, shortening the vegetation period – these are just some of the factors that worsen the conditions for vegetation growth on the surface of ski slopes, cause undesirable changes in its composition and reduce the resistance of the ski slopes to erosion. Unfortunately, violations of the strict prohibition of the use of any chemical or biological products in the manufacture of artificial snow are not rare. On the part of the operators, this is not only a gross violation of the national park statute and the agreed operating conditions, but also of the hygiene standards. The snow is made using water from streams, which are the sources of drinking water for mountain resorts.



The downhill mountain biking runs unnecessarily destroy the expensively stabilised surfaces of the ski slopes, and not only in the Svatý Petr ski area... (photo Jan Štursa)



The wide downhill ski slope on Mt. Stoh, modified in the 1990s, is one of the most dangerous downhill ski slopes. It is not yet fringed with (protected by??) mature forest and is often ice-covered. To the right we can see the remnants of the original ski slope, narrow and winding, which is almost invisible now in the forest (photo Jan Štursa)

Sunny nights

Interest in the best economic prosperity is another cause of serious contemporary problems of downhill skiing in the Krkonoše Mountains – the evening operation of ski slopes and the necessary lighting systems. The owners of the more prosperous skiing centres are increasingly coming to the KRNAP Administration with applications for authorisation of evening operations, the downside of which is the increase in light pollution in the national park. Every visitor arriving in Krkonoše in the evening in the winter season, will have noticed from a great distance the illumination of large parts of the night sky over Janské Lázně, Pec pod Sněžkou, Vrchlabí, Strážné or Špindlerův Mlýn. This is the price to pay for using imperfect lighting technology and oversized capacity. Not surprisingly, the KRNAP Administration staff are trying by whatever legal means and expert arguments to prevent such impacts on the quality of the environment in the national park. It is their mission, for it is our society which pays the

price. A study into light pollution of the environment, which especially compared the obtained data with many sports complexes in foreign protected areas, shows what a difficult journey environmentalists and ski areas operators still have ahead of them.

Another contemporary phenomenon which cannot remain unaddressed – is snowboarding. I do not want to talk about frequent collisions with skiers and countless unnecessary injuries, but about freestyle snowboarding, which is drawn towards the open snowfields off piste. In Krkonoše Mountains, however, most of the pistes run through mountain forests, or down the slopes, where forests died off in the past decades. Gross damage is done to the young trees in the laboriously and expensively reforested clearings around the ski slopes, so the park administrators together with the operators try to prevent such damage by all possible legal means (barriers around the ski slopes, ski patrols, limiting the transport of snowboarders on certain pistes, etc.).

The future of the ski resorts in the Krkonoše Mountains is also related to the frequently discussed effects of climate change. For medium-elevation mountain ranges such as Krkonoše, there is at least a serious reason for carrying out prognostic studies, on what socio-economic and environmental impacts could be caused by the anticipated (and ongoing) temperature changes, the quantity and distribution of rainfall or snowfall.

These aspects may not seem so important to fans of downhill skiing. They are more interested in the price of services in skiing areas, the length of queues at the lifts and cable cars, and plenty of well-prepared

snow on the slopes. The ski resort operators, Mountain Rescue Service, KRNAP Administration and other players on this common field, who must work to solve all of the problems described above, must steel themselves with infinite patience and arm themselves with the best expert reasoning in order to find a common language, common thinking. The application of this approach is the linchpin in the implementation of the 'Krkonoše Vision 2050 – Friendship between Man and Mountains', a document which suggests ways to protect and sustainably use all the natural and cultural assets that the Krkonoše Mountains offer us.



Their species diversity and landscape value make the meadows at Výsluní in the Velká Úpa valley one of the most picturesque places in the Krkonoše Mountains (photo Kamila Antošová)

12

Obří bouda Chalet

**Long journey
from birth to death**

The landscape of the Krkonoše Mountains is formed of an irregular mosaic of forests and treeless mountain enclaves with distinctive dwellings, which are called 'bouda' in the Krkonoše Mountains instead of 'chata', as in neighbouring Orlické Mountains or Jeseníky Mountains. The expression 'bouda' for a mountain cottage, lodge, farm was borrowed between Czech and German; from whence the name for an important chapter in the history of the Krkonoše Mountains (Baudenwirtschaft). At the time of its greatest expansion in the 18th and 19th centuries the mountain folk built dozens of 'boudy' on the slopes of Krkonoše, which at one time served as summer and year-round homes for farmers. Such was the origin of the Luční bouda, the oldest in the Krkonoše Mountains, as well as the Hamplova bouda, Petrova bouda, Špindlerova bouda, Scharfova bouda, Martinova bouda, Vosecká bouda, Dvorská bouda. The Obří bouda Chalet had a somewhat different history.

Inn on the square

The historical roots of this mountain chalet, which stood for decades on the northern rim of the Úpská jáma Cirque, date back to the mid-17th century. At the time of its establishment, it did not serve the herders or prospectors heading for the highest mountain in Krkonoše at all. The simple shelter with a hearth, which was left in the place where the Obří bouda Chalet was founded much later, was built by the owner of the northern slopes of Krkonoše, the Silesian Count Schaffgotsch, who decided to build a chapel on top of Mt. Sněžka. This shelter served his subjects, whose task was to deliver various materials and construction work on top of Mt. Sněžka. It is said that the first name of the Panská bouda Chalet (Herrenbaude), which was a precursor of future Obří bouda Chalet, dates from that time. The chalet disappeared after the construction of the St. Lawrence Chapel (1681) was completed, but in 1847 the merchant Mittlöhner from Velká Úpa built a new chalet on its foundations at a cost of 1,600 toalars to provide shelter to pilgrims heading for the eastern Krkonoše ridges, including



The Obří bouda Chalet, as most visitors to Krkonoše knew it in the second half of the 20th century, when it was in poor condition and its history was drawing to a close (photo Jan Štursa)

the summit of Mt. Sněžka. Since its very beginning the Obří bouda Chalet was a major destination for the early tourists in the mountains. The chapel on the summit of Mt. Sněžka was temporarily changed into an inn already in 1812 and the construction of a quality trail through the Obří důl Valley to the Krkonoše ridge was completed in 1881. In the late 19th century the Obří bouda Chalet could offer shelter and refreshments for up to 100 people in 35 guest rooms. But by then it had changed owners, and many times thereafter. At the beginning of the 20th century it was one of the most important ridge chalets, even though the nearby Heedmannova Chalet on the Prussian side of the mountains, later called the Silesian House, grew into a major competitor. This was the beginning of the somewhat nonsensical competitions between the Czechs and Silesians, Germans and later Poles, in building tourist facilities on the Krkonoše border ridge. On the one, and the other, side of the border, the owners of tourist facilities tussled with each other to offer a more attractive range of services, with more attractive national folklore, with greater capacity, lower prices...

When the Jubilee Trail was built to the summit of Mt. Sněžka in 1905, this small area on the western foot of

our highest mountain became a major crossroads for tourists of various nationalities and beliefs. In his book 'Krkonoše' from 1897, Václav Durych vividly depicts the great hustle and bustle of people in this area, who at an altitude of 1,395 metres, were dedicated to selling various souvenirs to tourists, refreshing them or operating a variety of cultural and musical attractions. The first ideas of linking the mountain ridges to the foothills on the Czech and German sides of Krkonoše also developed around this time. Fortunately, the planned construction of a cogged railway from Sobieszów to the Obří bouda Chalet or other visions on contemporary humorous postcards, which so aptly capture society's ideas of how the summit of Mt. Sněžka and its surroundings could look in the future, were never realised.

During the war years of the 20th century, the fate of the Obří bouda Chalet unfolded in a different spirit. In 1925, Obří bouda was the site of two international proletarian meetings to highlight the growing danger from German nationalist politics. In 1935 the German Motorised Artillery even drove up to the chalet. The dramatic pre-war events culminated on 24th September, 1938, when a Freikorps unit occupied the Petrovka, Špindlerovka and Obří bouda Chalets and bombarded the Czech



Especially in the harsh winter months, the Obří bouda Chalet was an important sanctuary for tourists, where they could decide whether to continue on the icy slopes towards the summit of Mt. Sněžka (photo Jiří Bruník)

patrols from here. During World War II most of the ridge chalets served the German Army, which was especially true of the nearby Luční bouda, Výrovka or the chalet on Mt. Sněžka. After the liberation of Krkonoše, most of the mountain chalets were confiscated by the state and the Obří bouda Chalet, together with many others were entrusted to the usage of the Krkonošské hotely Company (later Interhotel Krkonoše). It was partially remodelled and served the rapidly expanding tourism in the new society.

Decline

This was not the happiest period for the Obří bouda Chalet, and even accelerated the untimely demise of this popular building. Why did its typical hospitality no longer work? The historical chalet in the ownership of a nationalised enterprise was especially damaged by the frequent changes of staff. I experienced the typical atmosphere of the Obří bouda Chalet myself in the early 1960s, when I often used its shelter during the fieldwork for my diploma thesis. The lack of skilled employees and its remote location were

reflected in the 'professional profiles' of the staff. Some people with not very clean pasts found refuge here too. Therefore, the Police (in actual fact National Security Corps officers) often appeared here to arrest delinquents, whose jobs were then filled by similar types. Such frequent staff changes of people without the necessary experience, was bad news for the operation of the chalet and for its managers too. Indeed, even the managers of the chalet did not stay here too long. The extreme weather conditions worsened the condition of the Obří bouda Chalet every year, as the building leaked all year round, but especially in the autumn months, due to the lack of maintenance. In the winter the water froze in the walls. If the manager wanted to leave the chalet, he did so early in the spring when the sodden walls of the frozen building had not yet begun to thaw. The following manager of Obří bouda was soon reduced to tears when spring arrived, as he watched the deluge of water, which began to flow from the roof towards the cellar. If he was capable and had the necessary resources, he would help the chalet, otherwise, he soon handed it over in a similar way.

So the once popular mountain chalet gradually fell into a state of disrepair, and the combination with serious sanitary problems led to Obří bouda being closed to the public in 1970. Its function was taken over at the time by two nearby and very ugly kiosks. The increasingly dilapidated Obří bouda Chalet was eventually demolished in 1982, but this was preceded by stormy meetings on the future fate of the foot of Mt. Sněžka. The Hradec Králové Regional National Committee promoted the construction of a new chalet and the winning design in a competition organised by STAVOPROJEKT Hradec Králové was by the architect Karel Schmied. This not only caused great consternation among conservationists and natural scientists, but also among locals and a variety of professional experts. Old-timers will remember how many heated debates, political pressures and personal persecution followed. Beneficial interventions during the decision making process were made by the scientists (Dr. Jan Jeník, Dr. Jan Buchar, Ing. Jaroslav Stoklas, Dr. Slavomil Hejný) and especially the personal intervention by Prof. Emil Hadač - a member of the KRNAP Administration's Scientific Council, who used his contacts at the Central Committee of the Czechoslovak Communist Party and managed to favourably influence the adversely developing situation with his professional discussions in the newspaper 'Rudé právo'.



The unprecedented development of tourism and technical progress at the start of the 20th century initiated a variety of ideas of how to reach the mountain summits. Many of these ideas were only depicted on coloured period postcards. "How Mt. Sněžka will look at the end of the 20th century" was the text on this early-20th century postcard. Luckily, most of these visions have never been realised (collection of the Museum of Krkonoše in Vrchlabí)

The newly proposed facility and its future operation was a fundamental threat to the existence of the unique arctic tundra on the nearby Úpské rašeliniště Peatbog and the natural jewel of the eastern Krkonoše Mountains – the Úpská jáma glacial cirque.

Helpful fog

The stormy nationwide discussion led to a visit by the Minister of Culture Milan Klusák (in office from 1973–1988), who was accompanied by his wife and numerous functionaries and officials, when they arrived at the Luční bouda Chalet on an extremely inhospitable summer day in 1983. What followed was a situation, which we have exaggerated a little, in order to describe how dangerous it may be to drive cars over the marshy Úpské rašeliniště Peatbog in bad weather. The whole retinue set off on foot towards the foot of Mt. Sněžka in strong winds, cold, rainy and foggy weather. When they arrived in almost zero visibility and a strong gale, what followed was an explanation by the designers of how beautiful this vantage point was, and how the new Obří bouda Chalet would be constructed. This, however, was soon interrupted by Mrs. Klusáková (daughter of former President Ludvík Svoboda) who, whilst refusing to give sight to the dense fog, very indignantly said something to the effect of "How could any fool think that this is the right place for a beautiful view of Krkonoše." This again confirmed the idea of 'Cherchez la femme' – behind everything is a woman!



Since the beginning of the new millennium a new vantage point, from which tourists can observe the peculiar world of snowfields, botanical gardens and arctic tundra on the Krkonoše ridges, has stood on the foundations of the former Obří bouda Chalet (photo Kamila Antošová)

The first important step had been taken. Upon returning to Luční bouda, some good Moravian wine, of which Minister Klusák was a lover, contributed to the decision-making and the whole case of the future Obří bouda was closed surprisingly quickly. The Ministry of Culture, which was then responsible for nature protection in Czechoslovakia, rejected the proposal for a new Obří bouda Chalet. This contributed to saving this beautiful corner of the Krkonoše nature at the foot of Mt. Sněžka.

However, this was far from the end of the story of Obří bouda because the plot was disfigured for many years with construction materials from the demolition. During the cleanup of the demolition site and the construction of the stone vantage point in 2002, ("In beautiful weather there really are beautiful views from here, Mrs. Klusáková!"), the valid laws governing the activity and movement of people, machines and transport of materials along the Czech-Polish border were broken. At that time many people had to patiently hold dispute, on how to deal with the situation with construction activities on the state border. We managed this and a small area at the foot of Mt. Sněžka returned to life all year round, with a multitude of people from all over Europe heading for the highest mountain in Krkonoše. In nice weather the new vantage point offers breathtaking views of the wonderful scenery of the Obří důl Glacial Valley and Úpská jáma Cirque, and a place where visitors can plan the further itinerary of their journeys through Krkonoše.

13

Across the Krkonoše Mountains by air?

The study on the development of winter tourism in the Krkonoše Mountains by SECTRA

Dozens of Krkonoše ski lifts can carry an unbelievable 120,000 people per hour from the valley centres to the high mountain areas. Most skiers choose to descend again and again rapidly, while others choose a slower journey along the Krkonoše ridges. However, the Krkonoše Mountains have been a national park for 50 years, which also brings certain limits to the possibilities for harmless and sensitive use of the local landscape. This is also repeatedly reflected in the difficult search for common solutions to some visions and development projects for tourism in Krkonoše, which included the study by the French company SECTRA in the 1990s.

From west to east

The municipalities, which became tourist resorts, have been competing for the attention of guests for many decades. They vie with each other to offer the best prices for accommodation, ski passes for the ski resorts, in the quality of skiing infrastructure and the provision of complementary activities. Recently they must also compete with powerful foreign competitors – Alpine resorts which offer superior experiences, especially in downhill skiing, for discerning skiers at comparable prices. Therefore, the desire of the Krkonoše ski resorts to keep up in this tug-of-war and offer the longest, best-groomed pistes, evening skiing, artificial snow to extend the season, etc., is understandable. However, the Krkonoše Mountains are not inflatable and the elevations and length of the slopes cannot be compared with the extensive Alpine terrain. In this competitive rivalry there are few solutions for how to ‘extend’ the Krkonoše slopes make them more attractive. One vision builds on linking the major centres and extending the enjoyment of downhill skiers from the long and interconnected slopes, descending into several centres at a reasonable price with a single ski pass, valid for most or all of the ski carriers. This was the substance of the case concerning the offer by SECTRA.

Old-timers will recall that the powers at that time indiscriminately promoted a link between Pec pod Sněžkou and Špindlerův Mlýn, via the Modrý důl and Dlouhý důl Glacial



The ski area on Mt. Lysá hora above Rokytnice. The previously compact forest stands are broken up into fragments by the deforested areas of the ski slopes and the straight lines of the ski tows and chairlifts (photo Kamila Antořová)

Valleys and over the saddle at Výrovka, in the 1970s. A seemingly easy solution, but which did not respect the natural (especially the weather) conditions on the intended route at all, not to mention the irreversible damage it would cause to the natural and landscape values of the Krkonoše National Park. Due to strong resistance by the expert public and probably considerable embarrassment over the financing options, this vision was never realised.

There were also other ideas which emerged – how to connect Harrachov with Rokytnice nad Jizerou, Špindlerův Mlýn or Janské Lázně with Velká Úpa, or Černý Důl with Pec pod Sněžkou. The proposals were reflected in earlier versions of land use plans for these centres and were gradually included in several earlier versions of regional plans for the Krkonoše Large Territorial Unit (Krkonoše LP LTU). Then along came the political and economic transformation of society in 1989 and in this atmosphere new ideas and opportunities, on how to realise these earlier visions were created.

The Czech Republic was among the countries of the former Eastern Bloc, for which support from the EU

PHARE programme was born – a fund to finance the restructuring of centrally planned economies to the market. PHARE had strict rules on how it was possible to obtain funds, including the removal of disparities in technical equipment of border municipalities or the reconstruction of the transport network. In 1992, Krkonoše became the subject of interest from the French company SECTRA, which dealt with transportation and construction technology, infrastructure development in mountain landscapes and other project activities. It had completed many projects in Europe and overseas, and so did not escape the attention of people who were involved in territorial development opportunities, especially of skiing infrastructure in the Czech Republic, and specifically in the Krkonoše Mountains. Therefore, municipal representatives of the large Krkonoše resorts and the operators of ski areas were very interested in cooperating with the French. It was not long before the 'Study on Winter Tourism in the Krkonoše Mountains' (the Study), in its input form, the feasibility study, arrived at the KRNAP Administration. The main objective of the study was the concept of the completion and modernisation of the Krkonoše centres and their mutual interconnection.

Possibilities and limits

The staff of the KRNAP Administration received extensive materials that needed to be quickly translated from French and assessed. With hindsight it is possible to express regret that the KRNAP Administration was not contacted during the preparation of the Study, especially when we take into account the limits and possibilities derived from the statute of Krkonoše National Park and other valid legal standards at the time. The Study suggested linking the major Krkonoše centres in the vertical and horizontal directions by using existing ski lifts and proposed their modernisation, extension and construction of others, so as to allow the movement of skiers between Harrachov, Rokytnice, Horní Mísečky, Špindlerův Mlýn, Pec pod Sněžkou and Janské Lázně. From the perspective of skiers and from the perspective of ski carriers everything seemed logical and progressive. Unfortunately the study only very marginally and insufficiently mentioned the fact that everything has to take place on the territory of a national park. Despite the declared reduction in the environmental/pollution load, which was represented by thousands of skiers travelling between centres by car, through the valleys and the back roads in Krkonoše, and the impressive reflections on the many new job opportunities for local people and the ideas on how to significantly increase the income of local communities and promote Krkonoše, the authors of the Study hid the quantity of risks they did not address, could not or did not want to elaborate on. This emerged from a detailed analysis that the KRNAP Administration submitted to the Ministry of Environment. Among other things, it stated that the implementation of the Study would lead to:

- further undesirable fragmentation of mountain forests and accelerate their ongoing disintegration,
- long-term threats to the prepared project by the Dutch FACE Foundation to revitalise the Krkonoše forests destroyed by air pollution (the impacts of the objectives of the SECTRA Study and the FACE project were absolutely contradictory),
- negative impacts of and risks from construction and deforestation in the Third Zone, but even in the Second and First Zones of Krkonoše National Park,
- threats to the water management and erosion control functions of forest stands,
- significant direct or indirect increases in visitor numbers in the already critically congested summit areas of the national park (I and II Zones), with all the adverse effects on the unique natural diversity of Krkonoše.

The Ministry of the Environment justifiably criticised the Study for its many formal and legislative deficiencies and demanded their removal, so that the Study could be responsibly assessed (including EIA – the Environmental Impact Assessment). This was not a rejection of the proposed vision for the further development of Krkonoše, but a legitimate request not to rely only on the feasibility study and know-how from SECTRA, but to reflect the proposed conceptual design through knowledge of the reality in Krkonoše from all participating domestic partners. It could be expected that the opinion of the Ministry of Environment would unleash a local, regional and national storm. The opinions and analyses from naturalists and conservationists were supplemented by reams of documents: statement from the workplaces of the Forests of the Czech Republic, district and regional government offices, spatial planning institutions, the mayors of the Krkonoše municipalities, several ministries and the Czech Government. During 1992 and 1993 many meetings were held, with the media also joining in the game. The result was a clear request listing everything which needed to be finalised, in order to turn the suggestions from the Study into specific sub-projects, which could then be incorporated into the previously approved Krkonoše Regional Land Use Plan.

The cold shower came at a time when it was clear that obtaining funding for the objectives of the Study from the PHARE programme would be far from certain or generous. The SECTRA Company, and other foreign companies, which could have later profited from contracts for work on the project, gradually lost interest in the requested finalisation of the Study. The financial burden remained with the Czech side and the initially comprehensive project solutions throughout the Krkonoše Mountains were left to the local authority representatives and tourism service operators in each of the Krkonoše centres.

What happened next?

We have leapt into the 21st century and a lot has happened in the field of tourism and winter tourism in the Krkonoše Mountains. As the local and national elections brought several changes to the garnitures of elected representatives at various levels, there were also changes of opinion in the individual Krkonoše resorts on what is vitally important and what is not. The tumultuous new era heralded the construction of apartment buildings, artificial snowmaking systems,

evening skiing, widening of ski slopes, replacing ski tows with user-friendly chair lifts; problems caused by the rapid development of snowboarding were tackled, etc. The vision of linking the major centres in Krkonoše was replaced by individual cases, such as Mt. Lysá hora, Mt. Černá hora, Mt. Sněžka, Malá Úpa, Hnědý Vrch. The development of winter infrastructure equipment is fortunately not confined to downhill skiing, even if it is currently in first place among all development considerations. Together we managed to realise a different vision of linking the Krkonoše Mountains from west to east, through the well-maintained Krkonoše cross-country skiing trail – over 70 km of regularly groomed trails, which begin in Harrachov and lead over ridges and valleys until skiers arrive in Žacléř. Hundreds of kilometres of local ski trails and ski circuits connect with the main trail. The popularity of the red and white marked trail connecting the Krkonoše ridges and valleys is demonstrated by the fact that it is regularly used by more than 1 million of the 3 million winter visitors to Krkonoše.

However, the cross-country skiers and downhill skiers are two distinct groups in the Krkonoše Mountains' winter clientele, preferring either rapid vertical or slower horizontal movement over the snow. Only a small proportion of them are fans of both disciplines. Downhill skiers fill the ski resorts; cross-country skiers on the contrary fill the mountain ridges. The first ones undoubtedly represent a more important source of revenue, and therefore it is not surprising that the managers of winter resorts struggle to find new ways to increase the attractiveness of the services offered. The recently established domestic initiative for further development of skiing in Krkonoše from the Krkonoše mayors and ski resort operators, which is based on the former SECTRA vision, has led to stormy debates in the KRNAP Council. A document entitled 'Guidelines to Regulate the Development of Resorts in the Krkonoše Mountains'

was produced, some passages from which were also included in the newly prepared 'Management Plan for KRNAP and its Buffer Zone'. In an attempt to find the most environmentally friendly form of future winter usage of the Krkonoše Mountains, the Director of the KRNAP Administration assembled an expert group to examine the eighty proposals submitted to the KRNAP Administration by Krkonoše mayors and ski area operators. The conclusions of this group's work represent the consensus reached and the ideas of all stakeholders and also the maximum possible potential for the further development of skiing in Krkonoše. The working group looked at the perspective of the proposed interventions in the Krkonoše nature, as well as the perspective of easing road traffic in Krkonoše through interconnecting some ski resorts via ski lifts and cable cars. The proposals include connecting Rokytnice nad Jizerou with Harrachov via Studenov, connecting the Svatý Petr and Hromovka ski areas with Medvědin and Horní Mísečky, or connecting Velká Úpa (Portášový Boudy ski area) with Pec pod Sněžkou via the Javoří důl Glacial Valley. The relevant projects will be subject to further analysis and evaluation.

It is clear that there is a long-term and clearly worded vision for the further development of winter sports in Krkonoše. However, there are very serious limits, which many visionaries still do not admit, or refuse to admit – these are the distinct changes in climatic conditions, which are manifested in the great fluctuations in the amount and duration of snow cover. The solution of using artificial snow in the medium-elevation mountain conditions, such as in Krkonoše, has its limits. In this respect the Krkonoše Mountains are disadvantaged in comparison with the Alpine region, where the ski resorts extend to substantially higher elevations with a much longer duration of snow cover. This handicap must be taken into account in any further assessment of development proposals.

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Scars on the Slopes of the Krkonoše Mountains

From the recent history of logging roads

Even in the Middle Ages Krkonoše was covered by a more-or-less intact mountain forest complex. Man, however, in his increasing desire for accessibility and connectivity between different places in the mountain range, fragmented the mountain landscape into smaller and smaller sections and joined them with roads and paths of varying appearance and usage. Just on the Czech side of the mountains their network now measures nearly 1,500 kilometres, forming an incredibly dense spider's web on an area of 454 km². Some of its threads are evidence of the experience and humility of both ancient and contemporary mountain folk, while others are testimony to very insensitive interventions. This is the story of several of them.

Mountain forests then and now

Submontane and montane forests had always played the dominant role in the Krkonoše landscape, or rather they did until human hands bit into them and furrowed them with a network of forest trails, hunting and hiking paths, forest roads and logging roads. Their structure was mainly determined by the owners of the noble estates or their foresters, in various social and economic eras and according to the technology which was available for using the huge local supplies of timber. Until the late 19th century logs were extracted from the mountain forests by skidding, by floating or on sledges in the winter. Horses were great helpers in the transport of logs. The tree species composition of the forests was fundamentally changed (extensive deforestation in the eastern Krkonoše Mountains in the 16th century, especially the felling of beech trees near ironworks, etc.), but the damage to the relief of the mountain landscape was not easily visible, despite the considerable amount of trees felled. When the post-war years of the 20th century saw the displacement of most of the experienced German-speaking inhabitants, the traditional technology for transporting timber quickly lost its significance. The new technology included ropeway conveyors, followed by tractors (mainly of the skidder type from the 1970s



Steyr Cableway on the Lavina logging road in the Labský důl Glacial Valley (with the Pančava Waterfall in the background). The daily volume of wood mass transported by this powerful Austrian equipment was huge, meaning that appearance of the strictly protected Krkonoše landscape was changed from day to day (photo Jan Štursa)

onwards). However, it was necessary to get both of them up to the steep mountain slopes. Thus began the era of intensive expansion of the forest road network.

The economic profits to be derived from renewable resources – mountain forests, began to represent a significant item in the Czechoslovak national economy. This was clearly visible in the field of forestry education and subsequently in the practical care for the forests. Priority in forestry research also had to be given to the renewal of overmature forests in the mountains, making them accessible, the economics of reforestation and planting new stands. Despite the explicitly non-productive function of these forests (soil conservation, hydrological, air protection, health and recreation, landscape shaping, scientific ...), even forest managers in protected areas and national parks had to increasingly address the issue of access to forest complexes.

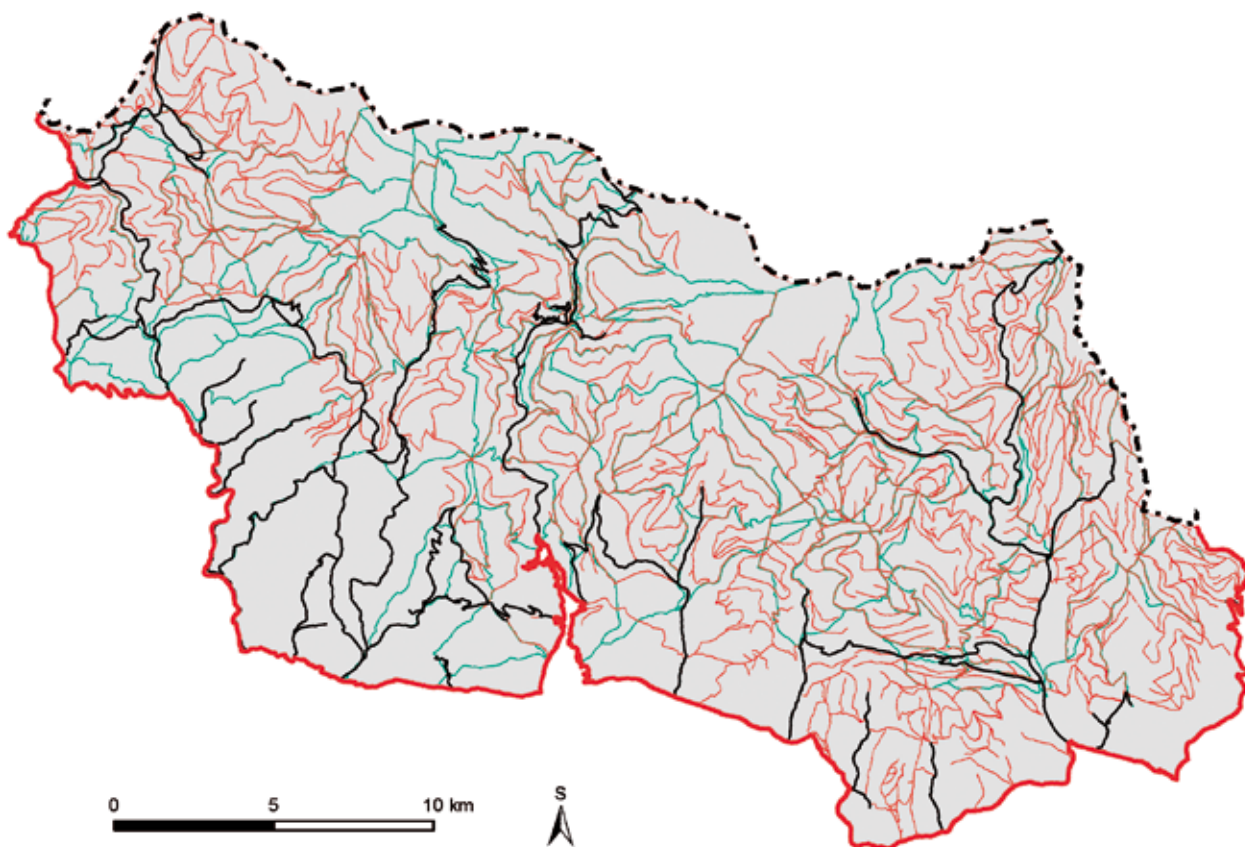
This was especially true after the series of repeated wind and insect calamities and especially with the onset of the air-pollution ecological disaster. This was fully reflected in the health of the Krkonoše forests in the 1970s–1990s, whereas it had devastated the forests in the neighbouring Jizerské Mountains a decade earlier. Animated discussions began about hundreds of hectares of overmature stands in Krkonoše that needed immediate renewal, yet how else could it be done than the clearcut extraction of thousands of cubic metres of useable timber. But how do you get to the forest stands? According to forest managers, the forest road network in KRNAP was not dense enough and did not allow the tractors and skidders to approach reasonably close to the felled forest stands. Using horses, wheeled or tracked tractors, various sizes of cable lifting systems, helicopters (first used in Krkonoše in the Mumlava valley in 1985). These were the possible means of transport, which had to reflect the

network of forest roads and then the entire logistic system, including the approved budget of the East Bohemian State Forests enterprise. Unfortunately, even in protected areas including national parks, there were attempts to prefer the timber-producing function of forests over the non-productive functions, although the latter had priority by law.

The attitude of our northern neighbours, where the forests were affected by air pollution in the same way as ours, was very different. Trees were only harvested along the lower border of the national park, whereas the pollution damaged stands at higher elevations were only underplanted and withering trees were left standing. For tourists the sight of gray swathes of dying forest was very depressing, but for the protected mountain nature, this type of forestry management

had so many advantages over the large-scale (albeit forced) emission clearings on the Czech side of Krkonoše. This can also be seen in the much lower density and character of the forest road network on the slopes on the Polish side of Krkonoše.

The technology of tree felling, skidding and transporting timber from the forest is a mature professional discipline. I do not want place myself in the role of arbiter in deciding what, when, where and how was well or poorly planned, assessed, or implemented in the Krkonoše Mountains. I do not have the relevant technical education. However, I deal with ecology, which entitled me to assess and oppose the presented construction projects for the forest road network in Krkonoše from various scientific and conservation perspectives. Every logging



The road and trail network on the KRNAP territory and its buffer zone reached a total length of 1,366 km at the turn of the 21st century. Very few montane national parks can 'boast' such massive fragmentation of the landscape. For all administrators and commercial interests, who care about the fate of Krkonoše National Park, this picture should serve as the best motivation for making decisions on which direction to take in the future usage of the values of Krkonoše (roads are marked in black, tourist trails in green, forest roads and some cart tracks in red; in many places the three categories run concurrently) (map Jana Kalenská)

road on the mountain slopes which was built earlier, or projected at that time, presented different geomorphological, hydrological, soil-protection, botanical, zoological, and especially landscape risks. During the last three decades of the 20th century, a small group of experts from the KRNAP Administration often clashed with the staff of various forestry and water management institutions, and unfortunately, often with their own superiors. For example, the Scientific Council of the KRNAP Administration fervently dealt with the gross violation of unique post-glacial landforms (moraines, terraces, fluvio-glacial sediments) during the construction of valley or slope communications in the Labský důl and Jelení důl Glacial Valleys and Kotelský potok Valley. Expanding or building new logging roads in Sedmidolí, on the Růžová hora and Prostřední hora massifs, on Mt. Liščí hora, at Přední and Zadní Planina, Mt. Vysoký Kolo, Mt. Medvědin and Krakonoš, or in the Mumlava Valley, led to extensive manifestations of soil erosion, supported introskeletal erosion (soil leaching from spaces between the stones), accelerated the penetration of undesirable alien plant species in valleys and along the mountain ridges. The road beds were built with thousands of tonnes of limestone and melaphyre – alkaline rocks, which are unsuitable materials in these parts of the Krkonoše Mountains. Today their usage is inadmissible because the previously used aggregates had long-term and substantially negative impacts on mountain forest ecosystems in the wider region. The dense network of logging and approach roads contributed to forest fragmentation, by leaving many open forest walls, which eased the access for critical infestations of herbivorous insects (Tortrix, bark beetles, spinning sawfly), thus accelerating the process of breakdown and death of forest stands, already weakened by the impact of air pollution. These interventions will be visible on the slopes for decades, in the case of the great width of some roads, even permanently in the mountain landscape. The crowns of the trees in the new stands do not cover these wide roads. The KRNAP Administration staff, who were provided with very limited powers at that time, perceived, assessed and opposed the State Forests' (socialist) building plans. Some plans were effectively challenged or reduced, but unfortunately many of the plans were realised, because in the end everything depended on the professional commitment of the individuals on both sides of the negotiating table. Of the three

departments of the East Bohemian State Forests (Harrachov, Horní Maršov, and Vrchlabí) the most significant interventions on the mountain slopes occurred in the central Krkonoše Mountains, which fell under the Vrchlabí department. Unfortunately, this was the beginning of the unhappy affair of logging roads which would stretch straight up to the heart of the First Zone of the national park – to the foot of the Labská jáma Cirque.

Lavina Logging Road

While wandering on the trail above the rim of the Labská jáma Cirque, a perceptive visitor may realise that very lively geohistorical events took place deep below them, on the avalanche slopes of the Harrachova, Pančavská and Navorská jáma Cirques and on the opposite slopes of Sedmidolí. From the modelling activities of ancient Pleistocene glaciers and thousands of years of avalanche activities, the still visible impacts of wind calamities in the 1960s, to the forests dying off due to air pollution, felling and logging works, and the renewal of mountain spruce forests. This is a time incommensurable historical abbreviation, as the natural processes took place on a scale of tens of thousands of years, while human activity has caused massive changes during several decades.

It is therefore necessary to consider the problematic and, in my opinion, extremely controversial role of the people who planned, imposed and subsequently built logging roads on the slopes of Mt. Vysoký Kolo, which were to connect the road leading from Špindlerův Mlýn to Medvědí bouda Chalet, via the Martinův důl and Pudlavský důl Glacial Valleys, almost to the floor of the Pančavská jáma Cirque and back via the Labský důl Glacial Valley around the confluence of the Pudlava and Labe to Špindlerův Mlýn. And they wanted to build a logging road even further, up to the Labská rokle Gorge below the Labská bouda Chalet! This was because 30–40 years ago there were still decaying remnants of an original mountain spruce forest, with huge centuries-old spruces, which were known for their highly-prized resonant timber. The air pollution calamity and the dieback of these unique stands was accompanied by escalated efforts to extract the timber supply from the head of the Labský důl Glacial Valley in time and according to the law, but to ensure the renewal of the stands. When the staff of the Vrchlabí State Forests



The felling and removal of dead and dying montane spruce stands from the slopes of Mt. Vysoké Kolo in 1984–85, as a consequence of the emission calamity, left its mark in the dozens of hectares of clearcuts. Thanks to the Forestry Regulations, these slopes were quickly reforested, but the Lavina logging road and extensive ecological damage to the fragile landscape will remain for many years to come, as an emphatic reminder not to carry out such activities in the protected nature in the Czech Republic (photo Jan Štursa)

came to us in the 1980s with a project to create access to the head of the Labský důl Glacial Valley, it was not easy to sweep the project off the table. So what unfortunately happened in 1984 was that – subject to agreeing with a number of conditional requirements from the KRNAP Administration – the Ministry of Culture granted an exemption from the protection conditions of the former Prameny Labe State Nature Reserve and authorised the project. Felling operations began and heavy construction machinery stripped metre by metre of granite mantle rock from the slopes of Mt. Vysoký Kolo. This horrifying destruction was right in the heart of the most valuable habitats in the national park. Thanks to determined efforts by members of the Scientific Council and some KRNAP Administration employees, and serious objections from several institutes

of the Czech Academy of Sciences, the exception by the Ministry of Culture was so vehemently disputed, that its validity was temporarily suspended. Many documents had to be processed before logging work in the Labský důl Glacial Valley resumed, including a plan for forestry management at the head of the Labský důl Valley, and a plan to ensure the renewal process of mountain spruce forests. Nevertheless, the speed of felling and heavy landscaping works only slightly slowed and did not stop, not helped by the unprofessional attitude of the KRNAP Administration Director at the time Ing. Vladimír Černoohlávek. The dimensions of the logging road had to meet the requirement to move the powerful, but heavy, Austrian Steyr cableway up to the head of the Labský důl Glacial Valley. This was no light cableway system, which today's students learn

about at the forestry faculties, and no cableway is ever used in mountainous terrain without unnecessary damage to the soil surface. One day a heavy monster, purchased from a non-socialist foreign country, appeared on the Lavina logging road. Thick trees hundreds of metres away at the foot of the Harrachova jáma avalanche slopes were used to anchor the carrier cable. Coincidentally, together with Tomáš Kyral from the KRNAP Administration we were descending from the Labská bouda Chalet to Špindlerův Mlýn when we saw a strange parade of people and technology on the Lavina slope from above. When we arrived, and found that the loggers had absolutely disrespected the conditions – to harvest the stands affected by air pollution only using the road in the Labský důl Glacial Valley – and were preparing to fell everything at the foot of the avalanche paths in the cirques, we tried in vain to interrupt their activities (at that time there were no mobile phones). It was only after returning to Vrchlabí and the impassioned discussions which followed that the logging was halted (I think about two days after our interventions!), but the trees at the foot of the Harrachova jáma Cirque and on both sides of the Labe had already been felled, which is visible to this day. At that time a further frightening dimension of the use of such technology became apparent – the daily quantity of the harvested materials versus the daily depreciation from the price of investments purchased for precious foreign exchange. Thus, the more you harvested, the more effective the investment. I believe that the depreciation policy of today's companies is perhaps somewhat friendlier.

Another set of problems related to the engineering of the logging roads. Their dimensions (width) were monstrous, because to build a road several-metres-wide on a steep slope, it had to be fringed by a wide cutting above it, with an embankment below it. The embankment was built up with tree stumps with roots, which decomposed over the years and grossly devalued the road, resulting in the need for demanding maintenance. In order to maintain the permitted gradient conditions, a huge transverse and longitudinal drainage system had to be built, because the road passes through peatbog spruce forests in several places. The technological project which was implemented here was one, which no designers or builders of roads in an area with the status of a national park could be proud of.

Liščí cesta Trail and Mt. Koule

Something similar took place on the northern slopes of Mt. Liščí hora, which the State Forests in Horní Maršov wanted to connect to the route of the historic Liščí cesta Trail, via the Široký hřbet Ridge and the Obří důl and Růžový důl Glacial Valleys. This threatened the unique glacial modelling in this part of eastern Krkonoše. By mobilising all legal options and ministerial connections we managed to get the construction work on this logging road halted and even forced the remediation of several hundred metres of the most recently built section.

The third request came from the State Forests in Horní Maršov to allow access by air to the pollution damaged and dying spruce stands at the head of Jelení důl Glacial Valley, on Mt. Růžová hora, Mt. Koule, Mt. Prostřední hora and Mt. Rennerova hora (involving 50,000 m² of timber). In this case, we already had enough experience from the realisation of the previous projects. And so this is how the third great scandal unfolded at the turn of the 1990s. However, at that time there was a totally different balance of power between the actors involved, there was a new Ministry of the Environment, a new Law on the Protection of Nature and Landscape, supported by a much more constructive cooperation between the State Forests of the Czech Republic and the KRNAP Administration. The air pollution scenario was no longer as dramatic. Strong support in the discussions on this controversy was given by Martin Bursík, Member of the National Council and later the Minister of the Environment, who continually acquainted Pavel Klimeš, a great patriot of the eastern Krkonoše Mountains, with the progress of negotiations and the work. We gradually managed to resolve many sensitive aspects of the route of the Mt. Koule logging road, so that it avoided extremely valuable geomorphological features, even resolving the bridge and ford across the Křížový potok Stream. The logging road was built with minimum parameters to make its intended subsequent remediation easier. This logging road was truly a model project, which was a welcome testament to the mutual desire to realise the least intrusive intervention into nature as possible.

Twenty years later

Act No. 114/1992 Coll., on the Protection of Nature and Landscape solved many problems for Krkonoše National Park, though by no means all of them. Its adoption certainly represents a great chance for the care for forests in national parks to be under the roof of one organisation, in which foresters and scientists can jointly agree on modern approaches to the long-term renewal of the mountain forests in Krkonoše which were devastated by man. The renewal of our oldest national park began with the participation of, and great financial support from, the Dutch FACE Foundation. This is a complete contrast to the former (forced) predatory trends in the relationship to timber. Especially in the KRNAP First and Second Zones wood matter is left in the forests, because its natural and long-term decomposition is an indispensable part of complex natural processes in mountain forest ecosystems. Removal of wood mass from forests in the KRNAP Third Zone and in the Buffer Zone is no longer only economically motivated, but by the preference for a gradual transformation of the almost entirely cultural forests in these parts of the mountains to a near-natural and more ecologically stable forest composition. In terms of the dynamics this

is a long-term and financially demanding process, while the success of today's actions will be assessed by our descendants.

There are still requirements for a forest road network today, and there will be in the future, but these requirements are quite different and incomparable with the past. The use of light skidding vehicles, small forest cableways or horses does not require such a dense and extensive forest road network. Today's care for previously built forest logging roads points to the possibility of progressively liquidating them or significantly reducing their dimensions.

This recently took place on a few hundred metres of the Lavina logging road (see magazine *Krkonoše + JH* No. 11/2009), but also in other parts of the mountains, where KRNAP Administration staff successfully tried various methods for such reclamation work. The recently adopted Management Plan for Krkonoše National Park and its Buffer Zone includes the mandatory liquidation of several old logging roads. This could herald the arrival of better times, at least for some parts of the national park. The removal of the horizontal 'hoops' of some of the logging roads would certainly improve the appearance of the renewed mountain forests.



View into the Labský důl Valley from the vantage point by the Pančava Waterfall. The cancelled and recultivated manipulation area on the Lavina logging road can still be seen in the young forest (photo Kamila Antošová)

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Troubles of Two Old Settlers

Alpine Saxifrage and Eurasian Dotterel

Many of the residents of the Krkonoše Mountains have records in their CVs of the remarkable fate, conducted by natural forces for many years, but more recently been under the baton of man. Many plants and animals came all the way from the far north to the Krkonoše ridges, as they migrated in front of the massive continental ice sheets which crawled to the northern foot of the Krkonoše Mountains during several ice ages. These ambassadors of Nordic nature have remained here. People have discovered them in the Krkonoše nature during the last few centuries and gradually clarified their distant origins, but they have also caused them many troubles. This fully applies to one of the six species of Saxifrage in Krkonoše and one of three species of Plover, for which Krkonoše became a permanent or temporary residence.

Secrets of the botanical treasure trove

On the northern slopes of the western Krkonoše Mountains lay a pair of impressive cirques – the Wielki Śnieżny Kocioł and Mały Śnieżny Kocioł, which were carved into the mountain terrain by ancient glaciers. The predominant bedrock all around is acidic and mineral-poor granite, quite inhospitable to the local vegetation, which is no different from other places on the Krkonoše ridges. However, in one place this does not apply, as a basalt vein can be found in the Mały Śnieżny Kocioł – one of the highest-situated outcrops of basic rocks in this part of central Europe. This basaltic gully and its close surroundings thus represent an exceptionally rich environment in Krkonoše for plants which prefer nutrient-rich substrates full of calcium and magnesium. Lovers of the Julian Alps or Dolomites are familiar with the exceptional diversity of the local flora, which fully utilises the surplus of both these elements in the stony mountain soils. Something similar happens in a few places in Krkonoše, where the nutrient-rich minerals (erlan, dolomitic limestone, basalt, porphyrite, green schists) emerged on the mountain surface during the geological development. On the Czech side are the well-known Čertova and Kotelská



Quido Mánes: 'Josefína Kablíková u Sněžných jam', 1848. Detail from a modern copy. The original is in the collection of the Muzea Karkonoskiego w Jeleniej Górze in Poland (collection of the Museum of Krkonoše in Vrchlabí)

zahrádka Gardens, on the Polish side is the Basaltic Gully in the Mały Śnieżny Kocioł Cirque, which is actually the absolutely richest botanical locality in the entire Krkonoše Mountains. So it is not surprising that the Mały Śnieżny Kocioł has attracted dozens of naturalists, as well as herbalists and pharmacy technicians ever since the 17th century, because here they found an extremely varied world of mountain flora in the otherwise poor surrounding Hercynian nature.

In the first half of the 19th century the distinguished collector and botanist, Count Kašpar Maria Šternberk, one of the initiators and founders of the National Museum in Prague, inventoried the flora of the Krkonoše Mountains. He was probably one of the first to find and collect the Alpine Saxifrage (*Saxifraga nivalis*) for his herbarium in the Mały Śnieżny Kocioł on the Silesian side of Krkonoše. Count Šternberk, who was engaged in detailed studies of European saxifrages, must have known well, what a remarkable discovery he had made. The distribution of the Alpine Saxifrage,

one of about 350 saxifrage species, covers the north of Eurasia and North America. Thus, the Mały Śnieżny Kocioł was the first explicitly central European locality for this rare species. The nearest locality is nearly 1,400 km away in the Snowdonia Mountains in North Wales. And this is how the popularity of the Mały Śnieżny Kocioł Cirque began. It was subsequently visited by many important Czech, Silesian and German botanists and most of them wished to have specimens of this glacial relict in their herbariums. This was unfortunate for the Alpine Saxifrage, which does not grow in pillow-shaped clumps like most saxifrages (e.g. the Purple Saxifrage, which also grows here), but forms only a single rosette and is a scattered inhabitant of rock crevices. Thus, irresponsible collectors managed to critically endanger this botanical gem of Krkonoše over the past two centuries.

In this way the Alpine Saxifrage travelled from Mały Śnieżny Kocioł to botanical herbariums all over Europe. An important figure among the Krkonoše



Mały Śnieżny Kocioł Cirque, the home of many remarkable botanical and zoological treasures. The basalt seam and scree cone are approximately in the centre of the photo (photo Jan Štursa)

botanists, Mrs. Josefína Kablíková (1787–1863), who boasted the nickname the ‘Priestess of the Krkonoše Flora’, played a considerable role in these travels. She was the daughter of the Vrchlábí industrialist David Ettel and devoted her life to becoming a botanist. In 1806 she entered into matrimony with the Master of Pharmacy Vojtěch Kablík, who had recently purchased the pharmacy in Vrchlábí. The house in Krkonoše street in Vrchlábí, which is still occupied by the Devětsil pharmacy, soon became an important centre of the cultural and social life in the Vrchlábí area, in which both spouses played significant roles (for details see the article by J. Švec, in *Krkonoše* No. 2/1972). Josefína Kablíková was a diligent collector and her high-quality herbarium items were highly valued. She collaborated with the P. M. Opiz Institute of

Botany in Prague and gradually sent nearly 100,000 herbarium specimens to various European scientific institutions.

Vojtěch Kablík was devoted to natural science research and in his pharmacy in Vrchlábí he kept a natural history cabinet, with extensive botanical and zoological collections, which is where many Krkonoše researchers also met. This period and the Kablíks’ versatile activities play important roles in both parts of our story. Their frequent guests included J. E. Purkyně and especially Anthony, Josef, Quido and Amelia Mánes, all relatives of the Kablíks. The painting by Quido Mánes – ‘Josefína Kablíková at the Sněžná jáma Cirque’ dates from 1848. Mrs. Josefína was accompanied on her trips to collect local flora by

Antonín Fierlinger, the Kablíks' pharmacy assistant, who was subsequently a pharmacy owner and mayor of the town of Sobotka. In the painting the young gentleman (incidentally, the great-grandfather of Zdeněk Fierlinger, the Czech left-wing politician) is carrying a rucksack with a package of herbarium specimens. We do not know whether Mrs. Josefína descended to the Sněžná jáma Cirque on that day, but the herbariums in many European botanical collections indicate their frequent visits and collecting activities at this important central European location.

The present and future of the Alpine Saxifrage

Despite her indisputable merit in the field of botany in Krkonoše, Josefína Kablíková and the other collectors probably contributed to the weakening of the population of this glacial relict, as the collection of one rosette almost certainly brought the demise of the affected individual. In 1959 Josef Šourek found less than ten individual plants in the Mały Śnieżny Kocioł Cirque, later the Alpine Saxifrage was considered as probably extinct. I had my first opportunity to visit this locality in 1980, when the members of a small botanical expedition from Charles University desperately searched for where they actually grew in the extensive Mały Śnieżny Kocioł Cirque locality, in the dense fog. Only the famously varied flora signalled that we were close to the Basalt Gully. At that time we only found a few saxifrage plants, which reinforced my determination to do the possible and impossible to save such a rarity. As a KRNAP Administration employee I was on good terms with our colleagues from KPN, and I soon got a very prominent permission to work in the Mały and Wielki Śnieżny Kocioł Cirques and contribute to the preservation of endangered species. I then very carefully took a few mature seed heads from the rock walls, and thanks to the efforts of the staff of the KRNAP Administration Gene Fund in Vrchlabí, we managed to grow dozens of plants of this critically endangered Krkonoše species. Their subsequent transportation and planting in different places in the Basaltic Gully would be worth a separate story. Despite all the efforts and the considerable safety risk, the result was pretty pathetic – from dozens of transplanted plants, only a few of them prospered and these still missed the natural destruction of the weathered basalt cliffs and the harsh high mountain environment. Anyway,

we discovered that this was not the way to proceed. It reminded us of the embarrassing result of many years of efforts by botanists from the Administration to save a dying population of Spring Anemones in the Čertova zahrádka – Devil's Garden (see *Krkonoše + JH* No. 8/2011). All of this was running through my head much later when I first saw the abundant populations of this saxifrage in Snowdonia NP and in Abisko NP in the north of Sweden. However, which path should we choose to rescue them at this unique location in the central European Krkonoše Mountains?

Our Polish colleagues eventually found another solution. In the Botanical Garden of the Wrocław University they tried growing new plants from tissue cultures from the sample of individuals from Mały Śnieżny Kocioł Cirque, and were able to produce mature plants that thrived and flowered. In this way they succeeded in growing dozens of genetically pure plants from the native population. When I visited the KPN Administration Gene Bank in Sobieszów last year and saw a pint glass filled with seeds harvested from the gene bank, and several thousand young Alpine Saxifrage plants they had grown, I stopped being worried about the saxifrage. A few days later I was on a joint patrol with the directors of both national parks in Krkonoše, when we stood on the rim of the Mały Śnieżny Kocioł Cirque and observed suspicious characters wandering in the Basaltic Gully, despite the strict ban on anyone entering this botanical treasure trove. One phone call, however, soon proved that they were KPN Administration staff, who were sowing the contents of the glass and thus starting what will probably be a much more successful way to save the Alpine Saxifrage in Krkonoše.

A flighty relict of the Krkonoše tundra

Not only Nordic plants, but also numerous animal species have managed to survive on the Krkonoše mountain ridges for thousands of years since the end of the last ice age. In addition to several insect species, this collection of old settlers includes the Dotterel (*Charadrius morinellus*), a medium-sized bird of the plover family, which is a common representative of the avifauna of the Scandinavian tundra. It is a migratory bird which leaves its northern territories after nesting and travels far to the south to its wintering grounds in North Africa, from where it returns in the spring. The



Alpine Saxifrage (*Saxifraga nivalis*) (photo Jan Štursa)

Krkonoše Mountains lie on its migration routes in either direction, as do other central European mountain ranges, where in the past Dotterels not only regularly stayed for a short time, but also nested. Relatively large populations even inhabited the tundra on the eastern and western Krkonoše ridges as recently as the late 19th century, but these birds, which nest on the ground and on grassy-rocky tundra, became the subject of inappropriate attention from the local population. The Krkonoše folk simply ate the Dotterels. Hunting of adult birds and eggs enriched the diets of the Krkonoše gentry and the poor mountain folk, especially the cattle herders.

The occurrence of dozens of nesting pairs of Dotterels is mentioned in zoological reports from the early 20th century. The last demonstrable nesting was observed on the 30th June, 1946 on Mt. Luční hora (this is certainly one of the most cited data in Czech ornithological literature). The zoologist Josef Mařan recounted his experiences in great detail in the journal *Sylvia*, when he was accompanied on that day by Professor

Kodym and members of his family, as they watched the classic behaviour of the nesting male, pretending to have injured wings and dancing around to try to distract intruders from the easily accessible nesting site. In the grassy and rocky tundra the nest is virtually invisible to humans. However, for the educated naturalist it was a signal to search for nests or young, in which they eventually succeeded. But in what circumstances! As the three newly-fledged young birds fled the nest, two of them stuck to the asphalt on the roof of a nearby bunker! After the chicks were rescued and carefully cleaned, they moved away in the company of an adult male (the male Dotterel sits on the clutch of eggs and looks after the hatched chicks!) And perhaps they even survived the encounter. This was the last record of Dotterels nesting in the mountains for many years. Here it is useful to recall the aforementioned Antonín Fierlinger from Vrchlabí. Besides his profession of pharmacy, he was also an avid hunter. He should also carry a large measure of blame for the long-term decimation of the Dotterel population in Krkonoše. Evidence of his shooting passion is

also provided by the handwritten notes in his copy of 'Vertebrates of the Czech Lands' by Frič – during one day he shot 17 Dotterels and collected 30 eggs! This data serves as proof of the former abundance of these birds in the Krkonoše Mountains. Fierlinger also shot Dotterels many times and his trophies enriched the natural history collections in the schools in Dolní Bousov and in Sobotka, where he was later the mayor. By this curious coincidence the Kablíks and their friend Antonín Fierlinger are connected with the biographies of the two protagonists of our story.

Contemporary fate of Dotterels in the Krkonoše Mountains

The post-war observation by Dr. Mařan long remained the last proven record of successful Dotterel nesting in Krkonoše. For many years, Dotterels were not seen in the Krkonoše tundra at all. It was not until the late 20th century that there were repeated reports of their occurrence (not nesting), probably during regular migrations from their Arctic breeding grounds. In the 1970s, the Director of the KRNAP Administration, Ing. Jiří Svoboda, decided to support the reintroduction of certain native fauna to Krkonoše. Along with the unfortunately unsuccessful attempts to return the Capercaillie to the Krkonoše mountain spruce forests, the Dotterel was also on this list. The late Krkonoše ornithologist Petr Miles diligently prepared a major project to air freight clutches of eggs from the Scandinavian tundra to the Krkonoše Mountains. This was a painstaking task in the time of the Communist regime, but all of the administrative obstacles were eventually overcome. The conditions for the express air freighting of the clutches of eggs in special boxes in the pilot's cabin of a Czechoslovak Airlines plane were agreed. There are many humorous stories about the technical details of how to safely transport the fragile eggs, but these stories are more suited to male company. In the intimate circle of friends and supporters of science in Krkonoše, our colleague Miles was always willing to tell this story and entertain us. In the end the project was not realised due to the bureaucratic approach of certain senior officials at the Ministry of Culture.



The Dotterel (*Charadrius morinellus*) was absent from Krkonoše for nearly half a century – but returned here in the 1990s (photo Jan Vaněk)

It was only after the Velvet Revolution that we had the opportunity to repeatedly observe Dotterels and Golden Plovers on trips to their Scandinavian homeland in the Dovrefjell, Jotunheimen and Abisko National Parks. By this time the Dotterel was literally on the verge of spontaneously returning to its Krkonoše nesting sites. Dotterels were repeatedly observed in the 1990s and we have finally managed to record its successful nesting in an area of lichen tundra on the eastern Krkonoše ridge several times in recent years. This is a great comeback, which was supported by the exceptional environment of the Krkonoše Mountains, respectively, the arctic-alpine tundra of the Sudetes, and stressed the need for strict territorial protection of this unique environment in a Europe-wide context.

16

Heritage of the Krkonoše Mountain Farmers

Transformation of the care for mountain meadows

The distinctive mosaic of mountain forests and meadow enclaves with a remarkable architecture of wooden timbered buildings is evidence of the long history of colonisation of our highest mountains, and testimony to the knowledge, feelings, humility and hard work of our ancestors. They cleared the forests and began to farm the resulting clearings. Although this reduced the total area of forests in Krkonoše, enough of them remained, as even today 80% of the mountain range is forested. After their farming, our predecessors left us a remarkable legacy in the form of colourful mountain meadows. Although they are the works of man, the meadows are important aspects of the biological and cultural diversity of the Krkonoše landscape. However, the fate of the Krkonoše meadows also reflects the variety of changes that man undergone in his relationship to the mountain landscape in recent decades.

Golden beginnings

During the era of mountain chalet farming in the 17th-19th centuries, man penetrated ever higher into the mountains to graze cattle and make hay on the deforested areas. Meanwhile, he handed down a variety of practices from generation to generation, with which the mountain folk optimised the use of mountain meadows. Although they had no vocational education, they were completely aware of the carrying capacity and other characteristics of their own or leased lands. They knew very well how many head of cattle, goats or horses they could keep, where to graze, where to cut and gather hay, how and with what to fertilise, which places to drain and on the other hand, which places to irrigate, by using ingenious systems of shallow surface ditches. Dozens of books and essays have been written about the Krkonoše mountain folk and their farming and they make interesting and informative reading. They tell us about the golden era of the legendary Krkonoše flower-rich mountain meadows. All this was true until the unhappy war years, when regular care of the mountain meadows suffered in the course of the war, when farming was in the

mountains was suppressed, but mainly due to the subsequent post-war mass removal of the German-speaking population from Krkonoše. Although this removal has been, and will be, interpreted in various ways, for the Krkonoše landscape it was one of the greatest injustices that man has committed against it.

Costly mistakes made

The fact is that regular cultivation of the meadows ended after so many years and the tradition of handing down centuries of experience was broken. With few exceptions, the new owners or tenants did not know how to cultivate the mountain meadows around the chalets and this became apparent very quickly from the condition of the lands entrusted to them. Weeds spread across the uncut areas, the species diversity on the mountain meadows declined, the enclaves were gradually overgrown by opportunistic woody plants and the lack of maintenance of the water

regime led to the waterlogging and degradation of many enclaves. When the cattle disappeared from the mountain enclaves, the basic motive and driving force in a complex system of relationships between the soil, plants, livestock and their owners was lost. This was the era of socialisation of our agriculture, when most of the resources and activities were focused away from the mountain areas and the meadows became derelict. However, a number of people from various institutions felt sorry that hundreds of hectares of previously beautiful meadows remained uncultivated and created plans for their reforestation. Many areas in Krkonoše were gradually planted with spruce, which was considered a flagship species by the foresters of the time for its rapid growth. The older generation still remember the spectacular reforestation work parties, during which millions of spruce seedlings were planted on the mountain meadows on the Rýchory massif, Suchý důl Valley, Albeřice and Sklenářovice, as well as around Harrachov, Rokytnice and Vítkovice. In this way almost 1,700 hectares of spruce monocultures



'In the Wolf-grass' – an etching by Erich Fuchs from 1928. It depicts the hay harvest on the slopes of Mt. Kotel, which is covered by Mat-grass meadows. One of many local names for this montane grass is 'vlček' (Wolf-grass), whence the name of this work of art by the well-known German graphic artist (collection of the Museum of Krkonoše in Vrchlabí)



The 12th Youth Volunteer Brigade was held in 1978, when the participants assisted the KRNAP Administration in caring for the national park. They repaired trails, cleaned the mountain streams – and liquidated the unsuitable spruces which had been planted on the reforested montane meadows at Rýchory (photo Jiří Bruník)

with scattered larch, alder and beech were established. The young stands suffered heavily from red rot and were damaged by game animals.

Unfortunately, many hectares of beautiful mountain meadows and floodplains disappeared and the Rýchory area provides compelling testimony to the harmful impact of this era on the forest-free ecosystems in Krkonoše. The KRNAP Administration made efforts to save at least some of the proverbial wealth of the Rýchory meadows, which were enhanced by the lilies, arnica, gentians, anemones, hellebores, violets and other gems of the mountain flora. For many years, our staff organised youth work parties, during which the participants again deforested the reforested meadows. It was a labour of Sisyphus, because the spruces grew rapidly on good agricultural soils and the liquidation of the wood mass was more and more difficult every year. We only managed to save a small fraction of the former glory of Rýchory.

At higher elevations in the Krkonoše Mountains, the rapid degradation of mountain meadows was also a result of the nature protection legislation (*Act No. 40/1956 Coll., on the State Protection of Nature*), as

well as the first statute of the Krkonoše National Park. This was because the former statutory provisions for the meadows in protected areas did not allow grazing or other human interventions, such as the cutting of hay. This was a gross misunderstanding of the importance of caring for such protected areas, including the majority of meadowland reserves, which had been created by the sensitive activities of our ancestors. It was only later, during regular revisions of the condition of the reserves, that we increasingly realised that the subjects of the protection – a variety of protected or endangered plant species, were disappearing from the reserves. Of course this was because many of them require a certain degree of damage to the soil for their lives, removal of old grass and woody plants, a certain disturbance (interference), which was guaranteed by the grazing cattle or wild animals (as well as fires in many cases) or by man with scythes or small machines. This was a period of great conflict between the strict conservation officers and the natural scientists, until common sense prevailed and painstaking efforts were made to restore the grazing management in the reserves, using cattle, goats, sheep, as well as the system of occasional and controlled burning of certain types of protected areas. In the case of the Krkonoše

Mountains however, this period heralded the major problems that advocating a return to the traditional cultivation of the mountain meadows would bring. During the great boom in tourism in the second half of the 20th century, there were major changes in the nature of the usage of the chalets; unused stables and farm buildings were converted into ski stores, clubhouses, dining rooms and other rooms. Even today these problems are still encountered in the promotion of various development activities (the era of building collective barns for storing hay, mountain family farms or supplementary farming activities at some chalets).

Socialist mass production

The 1970s and 1980s brought the trend towards building large pastoral areas, where herds of several hundred head of cattle, especially heifers, were grazed. Gone were the traditional Krkonoše Red Cattle – the original cattle which had grazed the local mountain meadows. Unfortunately, Krkonoše was also afflicted by this mania of socialist agriculture, and so hundreds of heifers of various genetic origins, were grazed in the foothills and at medium elevations in the mountains. In many cases, the structure of the mountain landscape became subordinate to the needs of the factory farms (liquidation of valuable wild greenery growing on the stony piles bordering the fields, melioration works, consolidation of lands and especially the long-term nutrient overload on the naturally poor to moderately nutritious meadows, but also restoration of turf using various grass seed mixes). This mass production in Krkonoše had its worst impacts at Albeřice and Lysečiny, Sklenářovice, Dolní and Horní Malá Úpa, the countryside around Babí, Lánov, Vítkovice or Rokytnice and Sklenařice. Large herds of cattle roamed the ‘fattening’ meadows but – oddly enough! – they still could not meet the expectations of massive meat production. And so the meadows were fertilised and seeded again, and so forth, until the beautiful, species-rich sub-montane and montane meadows were turned into botanically and nutritiously extremely poor meadows, on which the grasses waved gracefully in the mountain winds, but the cattle on them did not prosper. Not to mention the utter degradation of the soil and vegetation in places where such large herds of cattle were penned for the night. Such scars on the Krkonoše landscape can still be seen today!

At that time an event also took place, the consequences of which I described in 1977 in the Krkonoše magazine in the article ‘Notes on one experiment’. The previous year 1976 had seen extreme climatic conditions and farmers in the lowlands and foothills suddenly suffered from a chronic shortage of green fodder and hay. And once again, the heads of certain agricultural officials became irritated by the large areas of uncultivated meadows in the Krkonoše National Park. In past centuries it was not uncommon for herds of cattle to be moved from the lowlands to the mountains for summer grazing. There were plenty of quality mountain meadows and the high dietary value of fodder from them was also beneficial to the health of the grazing cattle. But that was long ago, when farming methods were different, and in different economic and commercial times.

In 1976 the Lánov State Farm decided to use the meadow enclaves high up in the mountains to graze their herds of heifers. After a lively debate with the KRNAP Administration, the decision was made to graze the meadows at the Zadní Rennerovky enclave, at elevations of 1,200 to 1,350 metres. One day a herd of 215 head of young cattle appeared there. Even though the grazing area was just about fenced in, there were frequent escapes of animals into the Prameny Úpy State Nature Reserve. The cattle spent the night without shelter in a makeshift fenced enclosure, of about 50 × 50 metres, where there was also a watering hole and where the cattle were fed. During the cattle’s one-month stay, they destroyed all the vegetation on an area of 3,500 m² and the soil profile to a depth of 50 cm was trampled and turned into mud mixed with excrement. Despite numerous interventions by conservationists, terrible damage was done to the meadows in the reserve during one summer and unfortunately, the consequences are still visible today.

I will never forget the outrage of Vojta Šubrt, a road mender for the KRNAP Administration and an outstanding ‘man of the mountains’, who had farmed at a nearby chalet in the middle of the enclave since the Second World War. He was one of the few post-war Czech settlers who successfully continued the traditions of the German-speaking mountain folk. He kept several cows and took care of the surrounding meadows, which was apparent from their well-kept appearance. We would often debate over a cup of honest coffee flavoured with fresh milk.

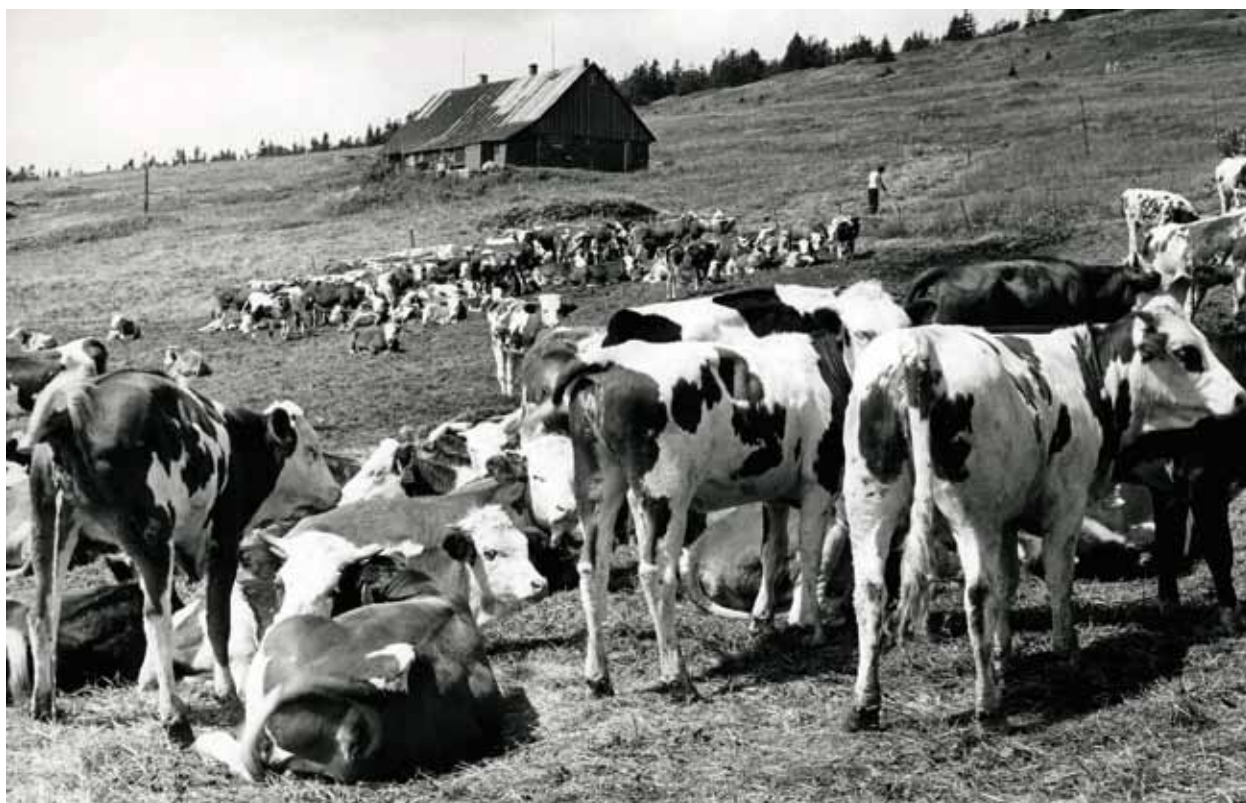
I would tell him my botanical and conservationist views, while he revealed various aspects of the work of a mountain farmer to me. At that time he was deeply unhappy about what was happening on the meadows around his home under the direction of the State Farm and could not understand why this was so.

My article, in which I criticised the injustices committed against the Krkonoše nature, had its aftermath. Somewhere in the office of senior comrades in Hradec Králové, a debate is said to have taken place on “Who does comrade Štursa from the KRNAP Administration think he is, that he can criticise our decision ...” However, the former Vice-President of the East Bohemian Regional National Committee Jan Pravda is said to have ended this debate abruptly, in this seemingly vapid, but typical for that time, way: “Comrades, invite him here, and if you convince him that he is wrong, then we will draw the consequences.” And this was the end of the discussion, no one invited me to the Regional National Committee because

of the article and nobody berated me for the article any more. However, the senseless damage to Zadní Rennerovky would take years to heal.

A sign of better things to come

In the 1980s, a second wave of reforestation mania even swept over the Krkonoše meadows, and was promoted by the Revolutionary Trade Union Organisation, which wanted its members to travel from all over the country to help with reforesting the fallow meadows. Fortunately, this never happened. The end of the century and the major political changes of 1989 were approaching. Shortly before these events, the Krkonoše meadows underwent a period when there was interest in cutting them, but there was no demand for the quality mountain hay from them. Some of the hay was transported to the ZOO in Dvůr Králové, but often there was not enough money to transport hay from



In the distant past a few cows grazed at the Zadní Rennerovky Chalets. During an experiment by the Lánov State Farm in 1976, ten times more cattle were crammed into a smaller area, unfortunately bringing all of dire consequences of overgrazing (photo Jiří Bruník)



At the end of the last century a large calf-raising facility was built in close proximity to the valuable botanical locality at Biner. This irresponsible act was at the expense of many hectares of species-diverse wetland meadows, which were unprotected at the time, but are now, thankfully, under the strict protection of the European Union (photo Jan Štursa)



Regularly cultivated montane meadows in the surroundings of the Seibr Chalet in the Zahrádky enclave near Pec pod Sněžkou. Their owners deserve the most sincere admiration from environmentalists and naturalists, as they have managed to conserve the typical flower-rich montane meadows, which Krkonoše was famous for in the past, thanks to their sensitive care (photo Jan Štursa)

the mountains to distant agricultural cooperatives. Economics had the final word. And so the painstakingly harvested grass mass was carried to the edge of the forest lands and piled up, or even worse, the piles of hay were even burnt. The meadows suffered, the people suffered, and no solution was in sight.

The situation began to improve slightly in the 1990s, after many of the new owners of mountain lands, which they had acquired, bought or received in the restitution process, slowly began to (re)develop the extremely important 'sense of belonging' to their lands. The new subsidy schemes from the Ministries of the Environment and Agriculture came into play. These brought many opportunities for the owners or tenants of mountain meadows to obtain substantial financial support in return for sensitive farming on them. Entry to the European Union has also brought new funding opportunities for the care for meadows in Krkonoše NP. Only the bureaucracy and paperwork was, and still is, too much. The conservationists from the KRNAP Administration had to patiently help the mountain residents to climb the mountains of forms, and in particular to explain to them how to take care

of the meadows, when and how often to mow them to maintain their quality, the best way to remove opportunistic trees or invasive plants or weeds, which, in many places had expanded strongly during the previous decades of neglect. Although mulching, the rediscovered agricultural technique that began to be used on large areas in the late 20th century, has some advantages, it also has a pile of drawbacks. This ultimately led to the situation that the meadows on the KRNAP territory, which acquired the status of Natura 2000 sites, came under the legislative tutelage of the EU and should not be mulched, i.e. mulching eliminates the eventual possibility of obtaining financial support.

Over two centuries, the Krkonoše mountain meadows and their farmers have experienced extremely turbulent events. Let them be a beneficial reminder to anyone who respects the Krkonoše nature and landscape and appreciates the beautiful territory of the first Czech national park, which has celebrated its first half-century of existence. Half a century of looking for ways to sensitively and considerately utilise the natural, historical and cultural values of Krkonoše.

17

Heads or Tails?

Problems concerning limestone quarries

From the first glance at the geological map, it is clear that in the Krkonoše Mountains acidic rocks (crystalline, silicate) prevail over those, which we classify as belonging to the group of alkaline (basic) rocks. The acidic rocks include granite, gneiss, mica schists, phyllites and other crystalline schists. These are relatively poor in nutrients and very fertile soils do not develop on such bedrock types, which is then reflected in the species diversity of the local flora. The varied flora of the limestone or dolomitic Alps is hundreds of kilometres away, so in Krkonoše, with a few exceptions, we encounter the relatively poor flora of the Hercynian Mountains. These exceptions include some places on the slopes of the glacial cirques with a surprisingly rich flora. This is also confirmed by their descriptive names such as the 'Krkonoš's, Devil's or Kotelská zahrádka Back Gardens'. The interplay of favourable living conditions in the Krkonoše botanical 'gardens' sometimes also applies in the case of exposed outcrops of nutrient-rich rocks - crystalline limestone, erlan, basalt or porphyrite. However, localities with an exceptional flora with high species diversity can also be found at the foot of Krkonoše. This is because a more or less continuous belt of crystalline limestones, dolomites, granite porphyry and melaphyre, rocks which are much richer in nutrients, stretches along the base of the mountain range. If such rocks lay hidden dozens of metres below the surface, this is not apparent in the richness of the flora. However, their outcrops which lay just below the surface or were exposed in the past by our ancestors who quarried the mineral wealth here, permitted the emergence of extremely valuable botanical localities. This then



In the early 1980s the lower of the two quarries by the Stará celní cesta (Old Customs Trail) in Horní Albeřice was almost completely hidden by growths of opportunistic shrubs. Certain rare heliophilous and calciphilous plant species began to retreat, which is why the KRNAP Administration decided to clear most of these bushes and maintain the quarry floor and walls in a forest-free condition (photo Jan Štursa)

led to the relatively complex contemporary conflicts between natural scientists and local companies, which seek to continue quarrying limestone or dolomite in the national park and its buffer zone.

Blunt statistics tell us that on the territory of Krkonoše, especially at its foot, man has excavated more than 90 quarries of different shapes and usage over the last 2 or 3 centuries. Our ancestors were mainly interested in limestone, which is generally scarce in the Krkonoše Mountains. It served them for building mountain homes, in building roads, or as a source of lime for various agricultural activities. Most of these quarries are not visible in the Krkonoše landscape today, because they had short lives, the raw material source was soon exhausted, and nature was able to



The Lom Strážné (Strážné Quarry) Nature Monument is also partially covered by bushes and trees, but still represents an optimal mosaic of locality types for plants and animals with varying habitat requirements (photo Jiří Dvořák)

cover them with dense growths of trees and shrubs during several decades. Many small quarries and pits lie between Rokytnice and Albeřice, along the line of the aforementioned belt of islets and lenses of crystalline limestone and dolomite known as the Krkonoše-Jizera Crystalline Unit. These anthropogenic landforms were described in great detail by the famous Krkonoše geomorphologist Vlastimil Pilous (*Opera Corcontica* 1984, *Krkonoše* No. 8/1981, 1 and 5/1984, 7/1985). The development of modern technology, however, in the last century led to more intensive industrial quarrying of limestone at several locations in this part of Krkonoše and heralded so many problems, which I would like to tell you about. Litigation and conflicts have taken place around four localities over what has to take precedence – either greater usage of natural, but non-renewable resources, or other societal interests, which include the protection of nature and landscape and a healthy environment.



The view from the western edge of the quarry wall clearly shows the enormous proportions and depth of the multi-phase quarry at Černý Důl (photo Jan Štursa)

The stories of the quarries in Horní Lánov and Černý Důl

If you are coming to Krkonoše from Prague or Liberec, a distinctive scar on the beautiful panorama of Krkonoše can already be seen from afar – the massive and still-growing quarry face near Horní Lánov. The quarry is located on the Bíner massif, which contains perhaps the largest limestone lens in Krkonoše, covering an area of 1700 × 500 m, where there has been a lively quarrying industry from two directions since the last century. The quarry in Černý Důl can only be seen when standing near the extraction area, and is hardly visible when passing through the village – as it is a recessed quarry, with the character of a quarry pit. The quarry in Horní Lánov is an open quarry face. Both of the sites are operated with very technically sophisticated systems of multi-level quarrying, milling and transport of the excavated material to the surroundings and further afield. During the culmination years of the air pollution damage to the Krkonoše forests, a small fraction of this crystalline limestone was even used for a short time in (highly questionable!) aerial liming of declining spruce forests. If the limestone quarrying had taken place in the unprotected and economically exploited landscape, so be it. However, this was in the buffer zone of the national park?

The limestone bedrock at both localities predetermines the high diversity of plant and animal species and communities, meaning that the surroundings of the two quarries are therefore scientifically extremely rich. The protected and often critically endangered plant species which can be found here include unique communities of calcareous, thermophilous, but also hydrophilic organisms in Krkonoše. The geomorphological phenomena on the surface and below it are also unique (Krkonoše karst phenomenon). Significant areas of fen vegetation may be found in the vicinity of the Horní Lánov quarry, which served as a field site for the rescue and transfers of endangered plant species for many years. The nearby small abandoned quarry on Bíner is also an important refuge for rare flora. Long-term monitoring of the surroundings of the Lánov quarry has recorded the occurrence of 10 bat species, which are strictly protected. In addition, the species diversity of other groups of organisms (spiders or lichens) in the extraction area of the quarry is most remarkable. The requested enlargement of the limestone extraction area would immediately, or subsequently, lead to serious damage or threats to such natural values.

Therefore, conservationists have been conducting intensive negotiations with the quarry operator – the Krkonošské vápenky Kunčice Company, for many years. The result of many specialist expertises, including the legally required Environmental Impact Assessment documentation and other scientific assessments, is the recently adopted decision by administrative bodies involved in the EIA process – that after 2012, the quarrying activity at this location will only continue by deepening, rather than expanding the extraction area. In some parts of the quarry, which are no longer quarried, there will be a process of natural regeneration of this technically disturbed landscape. The gradual and expertly controlled return of trees and other vegetation elements will lead to a gradual greening of these areas and partial remediation of the scars that industrial limestone quarrying has left on the landscape. The quarrying area on the opposite slope in Černý Důl can look forward to a similar future. Is this a sign of better times for this part of Krkonoše, or just a strategic delay for the further aggressive requests for the utilisation of mineral resources and the environmental burden associated with it? I personally believe that in this case, time will be beneficial for the nature, rather than the socio-economic interests, which are often misused in finding the best solution to

the problem. Should the priority concern be for the village, its inhabitants, a few dozen employees of regional companies, or for the interests of a wider spectrum of society, which sees the site from a broader, inter-regional perspective, for society as a whole? Perhaps the best arbiter in this case will be time.

The fate of the marble mountain

Allow me to paraphrase the title of the apt article by our colleague Pilous, who already published information about the quarry near the Hřiběcí Boudy Chalets in the parish of Strážné in the magazine *Krkonoše* No. 5/1984. The quarry utilised one of the major deposits of fine-grained crystalline limestone, which was quarried in the inter-war years under the name of Krkonoše marble. This was a desirable stone for building and sculptural purposes and was quarried in blocks, and only part of the quarry production was crushed and milled into building materials for glass works and rubber plants. After 1945, the nationalised quarry passed into the ownership of various state companies (the last of which was the Krkonošské vápenky Kunčice Company), which no longer quarried blocks of decorative stone, but began to use the highly destructive curtain blasting method. This caused the devaluation of the noble limestone deposit for use in masonry, yet at the same time high quality stone was imported at great expense all the way from southern Europe. Even the KRNAP Administration succumbed to the low price of construction materials, as the crusher in the valley below the quarry was in operation for many years and a proportion of the crushed stone was then delivered to many points in the national park, where our road menders used it in the maintenance of mountain trails. Unfortunately, with all the consequences for the nature in Krkonoše, which were described in the 'Case of the Mountain Trails' (K + JH 6/2011). The times were different, with different priorities and different people who decided about them.

From the early 1970s the extraction work in the quarry subsided and it was no longer necessary to wait at a safe distance for many minutes for the siren announcing the end of blasting and the danger of falling rocks (for the last time in 1975). This downturn was probably accelerated by the more favourable economic indicators for extraction at the Lánov and

Černý Důl quarries. After the technological equipment was removed from the abandoned Strážné quarry, natural regeneration processes came into play, which was soon reflected in the natural diversity. Suitable habitats for calciphilous plant species gradually developed in the two quarry pits, and especially some of our protected species of ground orchids spread spontaneously onto the newly colonised areas. Similarly successful succession occurred in the lowest storey, where permanent ponds in depressions were colonised by hydrophilic vegetation and fauna, especially amphibians. The long underground connecting tunnel, through which quarried material was previously transported, became a popular hibernating site for several protected bat species.

The KRNAP Administration scientists' joy over the natural development of the quarry at Hřiběcí Boudy was soured in early 1990s by a letter, in which Strážné village submitted the intention to use the quarry pit and a local source of clean water to build an attractive swimming pool for the village's tourist clientele. Patient negotiations eventually led to the village's decision to withdraw from the project and support the KRNAP Administration's efforts to declare the quarry as a small-scale protected area. The Lom Strážné Nature Monument was declared in 1988 (see *Krkonoše - Jizerské hory* No. 7/2008). An unfortunate beginning, with a happy end! You can see this remarkable site from a safe distance if you go along the red tourist route from Vrchlabí to Luční bouda, via Strážné and Hřiběcí Boudy.

Albeřice quarries

Of the limestone lenses and deposits in the eastern Krkonoše Mountains, the locations in Dolní and Horní Albeřice were extensively utilised. The first is located at the confluence of the Albeřický and Suchý potok Streams. Several old and long abandoned quarries are hidden in dense stands of trees, but a larger quarry on the right hand slope of the Suchý důl Glacial Valley is now the only active extraction area on the territory of Krkonoše National Park. It is smaller than the quarries in Horní Lánov or Černý Důl, and from the perspective of science or conservation, it is not a very serious a problem. The quarry is owned by the village of Horní Maršov and the dolomitic limestone quarried here is predominantly used for road gravel. A stop to quarrying would undoubtedly contribute to fulfilling



The appearance of the pair of quarries by the Stará celní cesta (Old Customs Trail) in Horní Albeřice at the end of the 1980s. The pastureland on the left edge of the photo has been completely trampled by grazing cattle (photo Jan Štursa)

the statute of the national park, but an optimal solution to the quarrying work at this locality will surely be found in the future.

The group of five limestone quarries around the Old Customs Trail in Horní Albeřice have a different history and present, as quarrying work finished here after World War II and the abandoned quarry pits have acquired a completely different mission. The natural succession of trees and bushes on the walls and floors of these quarries has turned them into important elements in the landscape character of this predominantly agricultural area, in which these islands of scattered woody vegetation serve as important biocentres. The abandoned limestone

walls and their surroundings have become refuges for many endangered calciphilous and thermophilous species (gentians, orchids, wintergreens, ferns, mosses, lichens and algae). Underground spaces in the Albeřice quarries are important hibernating sites for bats. The largest quarry – the Bischof (or Albeřice) Quarry, is a narrow and almost 40-metre-deep two-level quarry, resembling a canyon. A large chamber, which is flooded with water for several months of the year, was excavated at its foot. At the end of the chamber is the entrance, which experienced cavers use to enter the Albeřice Cave. It has several floors, with a length of 250 metres, and is the longest of all the 35 registered caves in KRNAP and its buffer zone.

The Customs Cave was discovered in a nearby quarry, and in 1974 the members of the Albeřice Speleological Group led by Radek Tásler discovered the Krakonoš Cavern, with a length of 120 m (Radek's richly illustrated articles include: 'Underground Lakes in the Albeřice Cave' in *Krkonoše + JH* in No. 8/1995 or 'Discovering the Customs Cave' in No. 9/1996).

During the mania for pastoral areas in the 1970s large herds of heifers were grazed near the quarries. This unfortunately left its mark on the nature around Horní Albeřice. Nutrients overloaded the surrounding meadows, the pastures were overrun by docks and other nitrophilous plants, the soil around the cattle pens and the sheet-metal summer shelters was trampled – this is how the landscape around the Albeřice quarries looked. A variety of agricultural waste was pumped into some of the quarries, along with waste from some of the cottagers. The pool at the bottom of the quarry near the cowshed was contaminated by freely leaking urine from the bedding, so everything was covered by two-metre-high growths of nettles. Despite all the injuries that man has inflicted on the nature in Horní Albeřice, some exceptionally rich natural phenomena have survived here. Such exceptional phenomena that the Albeřické lomy Quarries Nature Monument was declared; it now lies in the First and Second Zones of KRNAP, with the same strict protective regime as on the mountain ridges.

The Albeřice quarries, just like the quarry at Hřibčcí Boudy, are fine examples of how landscapes shaped by man in the past, can again perform many socially beneficial functions.



The tunnel-like chamber in the lowest part of the Albeřice Quarry is seasonally filled with 1–2 metres of water (photo Radek Drahný)

In such cases, it is even desirable to protect selected human works and care for them, not only for natural science reasons, but also for their social and technical history. The Klimeš brothers with their team and the KRNAP Administration have recently reconstructed a protected cultural monument in the vicinity of the Bischof Quarry – the octagonal stone tower of the 19th century lime kiln which part of the quarry production was previously processed (see *K + JH* No. 2/2012). An intriguing museum exhibition, which commemorates

local events as well as destinies of the people who inhabited the Albeřice landscape long ago and took care of it, can be found in the lime kiln. The key to the Lime Kiln Museum may be borrowed from the Veselý výlet Gallery in Horní Maršov. Considering its rich and turbulent history, Krkonoše has innumerable localities of this type. The national park is increasingly gaining an extra dimension, not only for its unique and irreplaceable nature, but also as the cultural heritage of our society.

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Friend or Foe?

Contemplation on avalanches in the Krkonoše Mountains

Despite their low elevation and small area, the Krkonoše Mountains can boast a high level of avalanche activity. In some years several dozen snow avalanches fall to the Czech and Polish sides of the mountains. These avalanches significantly affect the natural conditions in Krkonoše, but complicate the movements of wintertime visitors in the mountain ridge areas. In many cases avalanches have even ended the lives of experienced local mountain people. Therefore, it is not surprising that many people carry clear opinions on avalanches. It is necessary to fight them, because they do us harm. But the truth is quite different. The mountains are a natural part of the Earth's surface and avalanches have belonged to the spatial mosaic of their diverse faces, at least since the end of the Tertiary. With all their manifestations, however, we may feel that they are hostile towards people who permanently or temporarily inhabit the mountains. What should we know about snow and avalanches, in order to avoid their destructive effects, and to understand and respect their irreplaceable role in the mountain nature?

What do we know about them?

Much has been written about the Krkonoše avalanches in scientific literature, as well as in popular magazines. Probably the oldest record of avalanches in Krkonoše dates from 1655, when an avalanche fell from the southern slope of the Rychory ridge and killed 7 people in the village of Sklenářovice below. Further records of avalanches in different locations in Krkonoše were added in the following centuries. The extraordinary tragedy of the Kohl family from Svatý Petr, four members of which (father, son, grandson and great-grandson) successively died in avalanches on the Kozí hřbety Ridges in 1773, 1837, 1855 and 1875, has gone down in the annals of history. Great avalanches were recorded in 1819, 1827, 1844, 1845, 1846, 1866, 1877,



Avalanches regularly fall in the Malá Studniční jáma Cirque. The largest ones fell in 1956 and in the winter season in 1962/63. At that time, these avalanches fell as far as the floor of the Obří důl Glacial Valley and swept away the montane spruce stands which stood in their way. Even the chapel was moved by several metres (photo Miroslav Hladík)

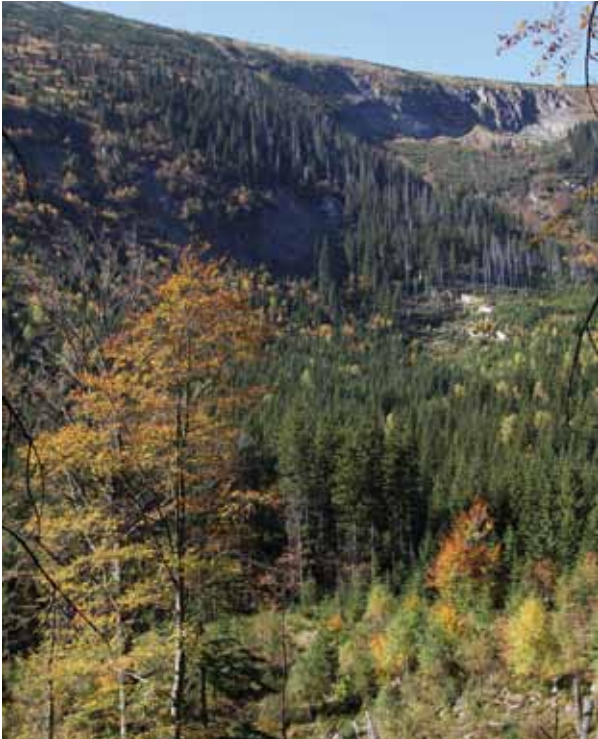
1887, 1900 and exceptionally rich avalanche years occurred throughout the 20th century. The higher frequency of avalanches in the Krkonoše Mountains was mostly related to the very rich snow cover in the winter and spring months, and the interplay of other, in particular climatic, conditions during the spring snowmelt. Literary sources indicate that during more than 300 years, avalanches on the Czech side of the Krkonoše carried away 92 people, of whom 67 died! However unreal this sounds, in connection with the pocket-sized dimensions of the Krkonoše Mountains, this is because the avalanche terrain on the Czech side of Krkonoše covers an area of around 450 ha, while the area on the Polish northern slopes is about 114 ha. Clear information on the issue of avalanches is contained in the richly illustrated publication by the KRNP Administration 'Avalanches in the Krkonoše Mountains'. In it we learn, for example, where the

avalanche slopes are, when, and how many avalanches fall from them, what avalanches mean for the Krkonoše nature, and what visitors to the mountains should avoid doing in places where avalanches fall.

Regular monitoring of avalanches in Krkonoše was initiated by the Mountain Rescue Service in 1962 and since then the fall of more than 1,100 avalanches in Krkonoše have been recorded and accurately described. The falling snow masses often also result in damage to the mountain forests (e. g. the avalanche in Labský důl Glacial Valley and the Úpská jáma Cirque in 1956, or in the Úpská jáma and Malá Studniční jáma Cirques in 1962). Violent disputes flared up in the early 1960s between Krkonoše foresters and naturalists, or conservationists in the newly declared Krkonoše NP. This was because a strict requirement for afforestation on avalanche slopes and the construction of avalanche barriers was included in the forest management plan. Fortunately, a book by the famous Krkonoše researcher Jan Jeník (*Alpine Vegetation of Krkonoše, Kralický Sněžník and of the Hrubý Jeseník Mountains*, Academia, 1961) was published at that time, in which the virtually undisputable and crucial role of avalanches for maintaining the natural diversity of mountain nature was described in great detail. After several years of persuasion, the Krkonoše foresters retreated from their intentions (unfortunately, several places in the Labský and Obří důl Glacial Valleys had already been planted with trees), and the fate of the forests on avalanche slopes, mainly in the surroundings of the strictly protected glacial cirques, was left to the direction of natural forces.

Things turned out differently in the Hrubý Jeseník Mountains, another mountain range in the Sudetes, which 'only' has the status of a protected landscape area. Afforestation works, using non-native dwarf pines, were carried out for many years on the avalanche slopes and grassy treeless areas above the alpine tree line, unfortunately including such important natural localities as the Malá and Velká Kotlina Cirques. It took until the turn of the 21st century before works to correct such environmental mistakes were begun in these areas.

The ancient mountain folk knew all of the manifestations and properties of avalanches very well; they avoided the avalanche slopes and did not build any structures in their surroundings. With the rapid growth of tourism and especially of various winter sports



Today the forests on the lower slopes of Velká lavina at the head of the Labský důl Glacial Valley show no evidence of the destruction caused by the massive avalanche which fell from the western slopes of Krkonoše in March, 1956. It ran for 1,375 metres and completely destroyed 9 ha of forest. The huge mass of snow and broken trees even lay on the opposite slope above the tourist trail until the autumn. A total of 5,000 m³ of wood was later processed and removed from the avalanche field. The Harrachova jáma Cirque can be seen in the background (left photo Jan Štursa, right photo Jan Jeník)

activities, the risk to human life from avalanches has also increased. With the rapid advent of tourism and especially the various winter activities, but as well as increased risks to humans from avalanches is always present. Despite the best efforts by the Krkonoše Mountain Rescue Service during the second half of the 20th century, the number of visitors to the Krkonoše ridges who are injured or killed has not fallen. Many skiers, as well as unwary and inexperienced winter tourists, have been killed in the avalanche terrain of the Modrý důl and Dlouhý důl Glacial Valleys and the Kozí hřbety Ridges. So far, the largest avalanche accident with 19 victims took place in 1968 in the Biały Jar Valley in Poland. The Krkonoše – Jizerské hory magazine regularly provides a detailed balance of the winter months, both from the perspective of the Mountain Rescue Service, and from the points of view of climatologists, biologists and conservationists.

Comparing the comparable

It is good to remember that avalanches in Krkonoše cannot be compared with avalanches in the Alps, Tatras or other high mountain ranges. What seem like appropriate, even necessary, solutions to prevent avalanches on the slopes above the large ski

resorts in the Alps are not relevant in these mountains. Even in Krkonoše it is not wise to underestimate the phenomenon of huge masses of snow sliding down the slopes. This is illustrated by the small avalanches falling at lower elevations, such as in the valley between Rokytnice and Harrachov. A classic example may be the story of forest harvesting on steep slopes in the Labská soutěska Gorge near Vrchlabí. Local drivers are familiar with the intricacies of the sharp bend on the road towards Špindlerův Mlýn, which is often affected by black ice (hence the local name – ‘Cold Knee’), and falling rocks from weathered rocky cliffs. After lively negotiations, the foresters cleared the 4.5 hectares of old forests on the slopes with gradients of 45-52° in 1984-1985. The highways department had legitimate concerns that after this felling, uncontrolled masses of snow would start to slide down the slopes, so they insisted that two-metre-high tree stumps were left standing to form a natural barrier against the release of snow. The slope was immediately replanted, primarily with fast-growing deciduous tree species. Valerián Spusta from the Krkonoše Mountain Rescue Service conducted regular avalanche monitoring there for seven years (during this period avalanches actually slid down onto the road). Today the slope above the road is

stabilised by young stands of deciduous trees. The Labská soutěska Gorge is a good example of how it is necessary to understand and respect the natural conditions anywhere in the mountains.

In the later part of the 20th century Krkonoše was affected by air pollution disasters and the spruce forests at higher elevations on the mountain slopes began to die off rapidly. None of the slopes were immune to immission harvesting (clearcuts) and there were fears that the snow cover on the inappropriately harvested slopes would become unstable and increase the frequency of avalanches falling, even in places where avalanches had never fallen before. A very volatile situation arose around the precipitous Kozí hřbety Ridges, especially the southern slopes above Svatý Petr, where large areas of forest were removed completely. Avalanches began to fall more frequently down a terrain notch into the Dlouhý důl Glacial Valley and the closest ones slid uncomfortably close to the Kamenka Chalet at the end of Svatý Petr. The fear of avalanches eventually resulted in the assignment of a special study, which was commissioned to evaluate the potential danger of avalanches in the Krkonoše Mountains and propose appropriate measures to reduce the risks of damage to forests and mountain settlements in some of the adjacent areas. The staff of the East Bohemian State Forests in Hradec Králové, together with the Krkonoše Mountain Rescue Service, commissioned a study by Slovak experts from the Avalanche Prevention Centre in Jasná pod Chopkom. When the study was on the negotiating table, another huge debate erupted over what was proposed in it. Because it showed once again, that what is good and appropriate in the Tatra Mountains, need not be suitable for Krkonoše. The authors of the study suggested using more sensitive procedures and methods of felling the damaged spruce forests below the alpine tree line, which was perfectly fine, but the multitude of biotechnical measures included planting trees near all edges of the Krkonoše glacial cirques. On the contrary, this was a complete misunderstanding of the key role of avalanches in the long-term dynamics of these valuable sites for the Krkonoše nature. The study was rejected by Czech scientific institutions and no avalanche measures were implemented. Care for the forests in Czech national parks was taken over by the national park administrations under the Act on the Protection of Nature from 1993. Quiet zones were designated in parts of the forest below the upper tree line in Krkonoše, where felling was forbidden

(borders of First and Second Zones) and the forests were left to natural development processes, among which avalanches, landslides or creeping snow play indispensable roles.

To detonate or not to detonate?

The media began to be busy around snow avalanches in the 2002/2003 winter season, which was abnormally generous for snowfall. It again showed the dilemma of the imbalanced, mostly wintertime, usage of Krkonoše. When the winter was poor in snowfall, the revenues of local businesses fell, in proportion to the fall in winter visitor numbers. If there was a lot of snow, in addition to increases in revenue, the number of injuries also increased, including those that occurred on the mountain ridges and on the avalanche slopes. Then various suggestions were made on how to improve prevention and what to do to let people here live better and calmer lives.

During that winter season, the avalanches made the headlines in all the media. At the beginning of January the Krkonoše Mountain Rescue Service came to us with the request that, in order to allow access to certain trails, it was necessary to blast the avalanches. This concerned the Kotelní jáma Cirque, Bílé Labe Valley, Dlouhý and Obří důl Glacial Valleys, places



Visitors who do not respect the Mountain Rescue Service warning signs are unnecessarily risking their lives. Trails which lead through the heads of the mountain valleys and the Krkonoše glacial cirques are closed all winter and in early spring for safety reasons (photo Radek Drahný)



The permanent forest-free areas in the Schustlerova zahrádka are maintained by avalanches on one of the many avalanche slopes in the Labský důl Glacial Valley (photo Radek Drahný)

where the trails are closed for the winter months every year. Black and yellow Mountain Rescue warning signs drew attention to the danger of avalanches and that access to these sites is 'at your own risk'. Previously, there was a truly unambiguous word – 'forbidden'. However, after the Velvet Revolution, to many people this seemed to be incompatible with human rights and freedoms, and was no longer a ban, but just a warning. Unfortunately, with all the consequences in particular on the behaviour of visitors who underestimate the risks of the mountains, or on the other hand deliberately seek to take risks. So the blasting should have started. The KRMAP Administration was strongly against it and therefore was immediately accused by the media, that "we are preventing safety in the mountains", although it was a gross untruth. Neither *Act No. 240/2000 Coll., on Crisis Management*, nor *Act No. 239/2000 Coll., on the Integrated Rescue System*, could be used clearly to make an objective interpretation of what 'threats' actually originated in the Krkonoše Mountains. Was it an immediate threat to life, which may be declared a 'calamity situation' and protectionist interests must then be put aside, or not? The tension in those days then quickly faded from the moment when it became clear, that it was not so easy to sign the order to blast and to choose the legitimate and experienced people, who would bear all the risks associated with unforeseeable situations when a mass of snow began to move. Indeed, just recall the events surrounding the disaster in Biały Jar Valley in 1968. At that time the remaining Polish soldiers tried to blast the cornice above the valley using mortar shells, to reduce the risk of further avalanches falling on the rescuers who were working on the avalanche bed. The mortar shells missed the cornices and exploded in the snow near the Luční bouda Chalet, to the surprise of many tourists who were in the area. So even in 2002, avalanches were not blasted in the Krkonoše Mountains.

Life goes on in the Krkonoše Mountains, more and more new outdoor activities are added, and logically, increasing the likelihood that someone will get hurt or killed by avalanches. For skialpinists or fans of snowboarding and freeriding, the deep snow cover on the avalanche slopes is a direct magnet that brings them a lot of adrenaline experiences. Why not jump over the huge cornice on the rim of the Kotelní or Studniční jámy Cirques and experience the feelings of adrenalin of the athletes, who are occasionally seen in television footage from various high mountain ranges around the world? However, conservationists, as well as the Mountain Rescue Service, hold a different viewpoint on these legally prohibited activities in Czech national parks and protected landscape areas. And rightly so. In an effort to at least partially regulate and reduce the risk of such illegally operated activities for nature and for winter visitors, the KRMAP Administration along with Krkonoše Mountain Rescue Service and the Czech Association of Mountain Guides, issued a list of suitable terrain for alpine skiing (not for snowboarding and freeriding) in the First Zone of the National Park, and prepared comprehensive information for skialpinists wanting to indulge in this activity in the Krkonoše Mountains. This list may be found at www.krnap.cz.

Finally, it should be noted that snow always provides a friendly service to the mountain nature, even though the man's short term perspective can see it as a rather harsh sign of friendship. This fully applies to avalanches in Krkonoše Mountains. It is important to read more about them from time to time, than just a warning that we have a mountain hike in the area where there is avalanche danger and that we are entering at our own risk. Snow avalanches are a magnificent manifestation of the untamed mountain nature, have belonged to the mountains since time immemorial, and are worthy of our admiration, but at the same time also deserve our proper respect.

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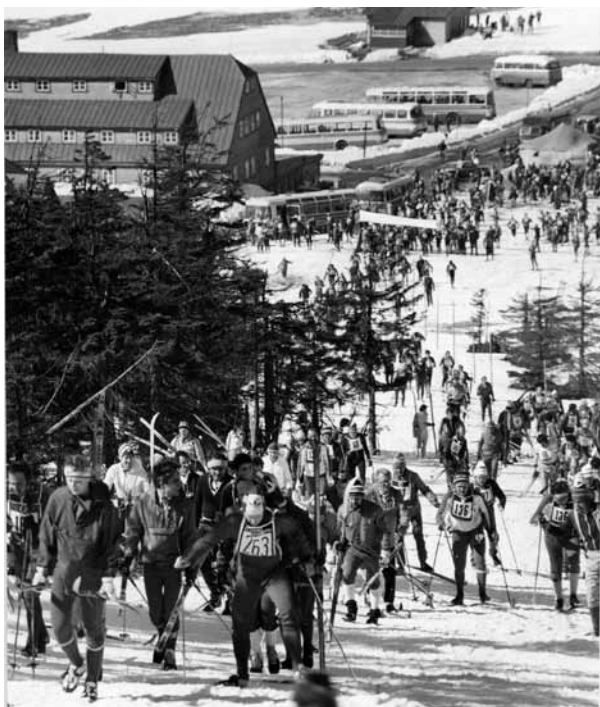
70 km along the Ridges of the Krkonosé Mountains

**A compromise
between protection
and usage of the
nature in the
national park**

Krkonoše offers fans of the white trails not only excellent snow conditions and cross-country skiing terrain, but also pleasant tourist infrastructure that has been built continually in our highest mountain range for over a century. With its long history of winter sports events, Krkonoše has undoubtedly made a name for itself on the sporting scene. On the one hand, the natural values, for which Krkonoše is famous far and wide, on the other hand, an attractive mountainous landscape which provides people with endless possibilities to strengthen their physical and mental condition. For the philosophy of rational usage of all the values that the mountains give us, it is all the more important that the Krkonoše Mountains are a National Park. The popular 'Krkonoše 70' cross-country ski race is a good example of how difficult it can be to achieve the principles of such an approach.

A little history and comparison would not hurt

At the turn of the 20th century winter tourism in the Krkonoše Mountains experienced its initial boom and ski clubs on both sides of the mountains began to organise the first regular cross country ski races. They were held under the mountains and high up on the ridges, with events including the international 50-kilometre cross country ski competition along the Krkonoše ridges. On 24th March, 2013 it will be 100 years since the legendary 7th running of this prestigious race, in which the excellent Czech skier and athlete Bohumil Hanč and his friend Václav Vrbata perished. The circumstances surrounding these tragic events from 1913 have been depicted in books and movies. It was not until much later in the history of Krkonoše cross-country ski races, that an event under the name of 'Along the Krkonoše Ridges' was held. This race was organised by members of TJ Red Star Hradec Králové and Sokol Bílá Třemešná and was held for the first time in 1955.



The Slezské sedlo (Silesian Saddle) was one of the most important places on the route of many editions of the Seventy. The start of the race was originally from the Špindlerova bouda Chalet, while later it served as a refreshment station before the demanding climb to the slopes of Mt. Malý Šišák (photo Jiří Bruník)

However, this race was not the predecessor of the 'Krkonose Seventy', because it was originally a marathon orienteering race along the route Špindlerovka – Luční bouda – Náchodská bouda – Černý Důl – Foř – Dolní Olešnice – Mostek – Bílá Třemešná. The race was held as part of the First Spartakiad with five ten-man teams, making 50 competitors. Since a considerable part of the route had to be travelled without skis, the route and organisational concept were soon changed. In later years the entire route led along the Krkonose ridges and from Svatý Petr via Horní Mísečky, the Vosecká bouda, Špindlerová bouda, Obří bouda, Luční bouda, Liščí bouda and Lyžařská bouda Chalets and across Pláň back to Svatý Petr. Initially the race was only for ten-man teams, but from 1964 the race was expanded to include a 25-kilometre womens race for teams of five. The route led from Špindlerův Mlýn, via the Jestřábí bouda, Labská bouda, Špindlerovka and U Bílého Labe Chalets, back to Špindlerův Mlýn. The race, which was born in the cradle of skiing, had become very popular due to its length and complexity (total elevation of about 1,500 metres, different

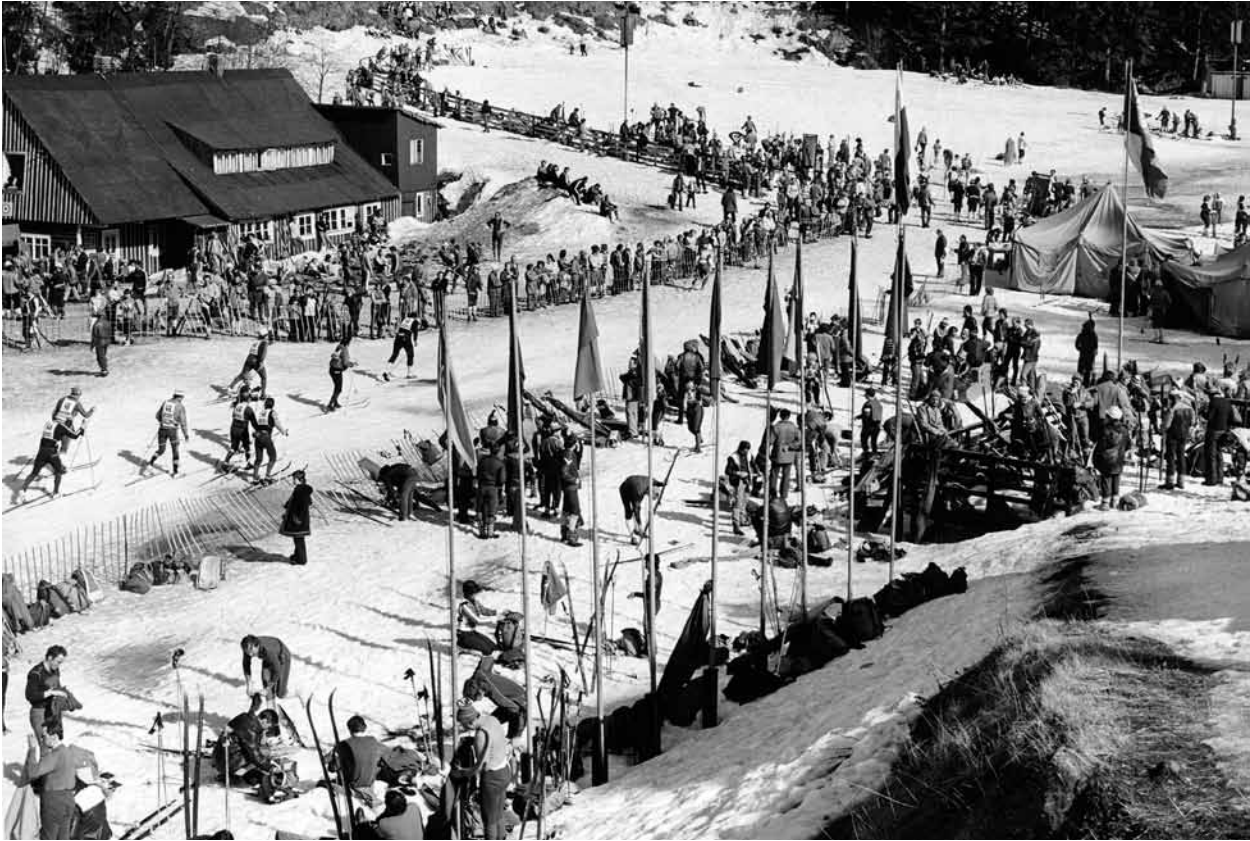
climatic and snow conditions) and was a huge annual sporting challenge for the cross-country skiing community. At that time the famous Vasaloppet cross-country ski race in Sweden and other annual events in Norway, Finland and elsewhere in Europe were as difficult as the Krkonose Seventy in terms of overall difficulty and conception.

Later, a second top event appeared on the domestic scene, after the 'Jizerská Fifty' was first held in 1968. However, this is a totally different type of race, as it is for individuals (not teams), the classic style is used (not the freestyle technique as in the Krkonose race) and for many domestic and foreign athletes it is essential that the Jizerská Fifty is included the Marathon World Cup, so that top racers may earn points for the World Cup table.

How does a problem arise?

The number of entrants in the Krkonose cross country ski festival continually grew, and with it the struggle, which took place not only between the athletes in overcoming the pitfalls of the Krkonose mountain ridges, but also between all the actors in this sporting event. In 1980, the 70 km race along Krkonose ridges had 3,990 men and 675 women participating; while three years later there were an unbelievable 6,390 men and women skiing in the race. During the last 57 years, the event has already been attended by over 100,000 skiers. The initial problems associated with this mass participation event were unpleasant, but manageable, for the national park. These included the rubbish, mostly drinks cups, banana or orange peel, various biscuits wrappers, which primarily accumulated around the refreshment stations. If the weather was not too bad, not snowing and not windy, then the organisers were able to remove such traces after the big race. But if the rubbish was covered by snow or the wind blew it away from the ridges, it was much worse.

In less favourable snow conditions the competitors often ran from the start in Špindlerův Mlýn to Zlaté návrší Hill (carrying their skis), blackened heaps of worn out socks, in which many of the skiers conquered the hard firn covering the Vodovodní Trail, lay strewn all around the around Vrbata Chalet. Despite the time intervals between the team at the start, after a few kilometres the rival teams were so bunched up



The atmosphere at the start of the Seventy at the stadium in Svatý Petr was that of a prestigious skiing race (photo Jiří Bruník)

that, especially in the sections between Labská bouda, Petrovka, Špindlerovka, Luční bouda and Výrovka, this turned into a more serious problem. The Hraniční hřbet (Border Ridge) is covered by periglacial scree and dwarf pine vegetation which is occasionally cut back, but only enough to leave a band 3–4 metres wide around the trail. If there was not enough snow in some years, or the snow was icy, the skiers spread out at such places into a very broad stripe. This caused massive damage to the dwarf pines, with branches stripped down to the wood, which was a horrible sight to see in the 1970s and 80s, when the Krkonoše air pollution disaster struck. The damaged branches were gateways for various fungal infections and insect pests and the health of the dwarf pine growths in such places was very poor. At the very windy locations around the chapel on the Modrý sedlo Saddle and on the slopes of Mt. Luční hora, dozens of square metres of unique lichen tundra, with many rare species of plants and animals, were heavily disturbed by hundreds of skis, with wind and water erosion then finishing the work of destruction. One could argue

that thousands of skiers travel through these areas every winter and nothing happens. The truth is just the number, not the consequences, because excessively intense stress and disturbance to the natural environment in a short period of time, has far more serious consequences than the long-term effects and the distribution of such a load. This is because individual organisms and their ecosystems then use a range of adaptation strategies.

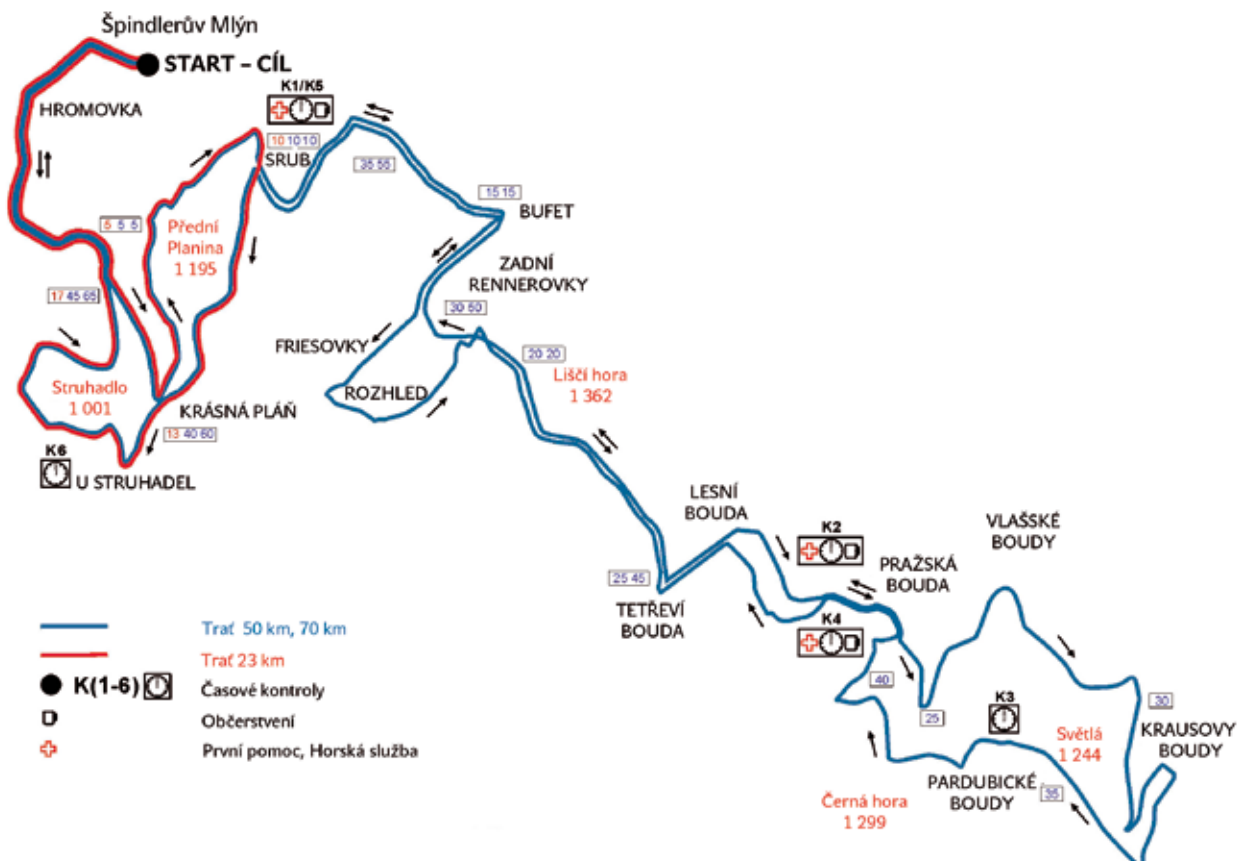
The conservationists began to fight against the growing, and rather unnecessary, damage by using all legal possibilities. Countless meetings took place, in which solutions were sought to reconcile the popular ski race with the fact that it takes place on the territory of a national park. It should be emphasised that the issue was not to have the Seventy stopped, but to organise it in a way that could prevent damage. This race had and has a great reputation, but also has patrons in the highest sporting circles. For example, the Krkonoše Seventy was supported for many years by Miroslav Hlaváček, the well-known sports official,

active sportsman and promoter of tourism, movement and recreation in the countryside. After his death in 1984, for the next few years the race bore the name Krkonoše Seventy – Dr. Miroslav Hlaváček Memorial. It is a race that became a phenomenon. Ever since its beginnings, it has been a race with a collective concept and a unique atmosphere, representing great sporting and moral incentives for participants in various age categories, who represent their sports clubs, but also for groups of friends, for skiers and climbers, as well as canoeists, athletes and fans of other sports and tourist activities.

... and how to solve the problem

In order to combine the noble motivations and objectives of this race with the mission of the Krkonoše National Park at the end of the 20th century, all

stakeholders who participated in the organization of the Seventy held regular meetings. The participants included the TJ Red Star Hradec Králové, TJ Slovan ÚV ČSTV and TJ Lokomotiva Trutnov sports clubs, Krkonoše Mountain Rescue Service, KRNAP Administration and others. Standing around detailed maps of the Krkonoše Mountains, a large team of people discussed how to change the route of the race, so that the aforementioned problems and damage could be avoided. At that time, the main motif of the work by Bohuslav Sýkora, a promoter of skiing, a respected expert on Krkonoše and the long-time Chairman of the KRNAP Administration Scientific Council, proved to be of great benefit. This passionate skier, who many already knew in 1964 as 'The Canary', carried out a detailed analysis of the topography and snow conditions in the Krkonoše Mountains, in terms of their potential use for downhill and cross country skiing (*Opera Corcontica*, 1964). In this work, Sýkora divided Krkonoše according to the relief and snow cover



The current route of the Seventy is the result of a sensible compromise between all partners involved in the organisation of the race



The start in Svatý Petr, 1995. The determined faces bear witness to the strong motivation needed to successfully complete one of the most demanding cross country skiing races in Europe (photo Karel Hník)



Freestyle skiing at Pláň in favourable weather conditions makes this one of the most pleasant places on the Seventy (March 2012, photo Jiří Bašta)

into three different sections – the Main Ridge, the Inner Ridge and the Krkonoše Foothills – and described in detail various possibilities for their usage. The Inner Ridge, specifically the Český hřbet Saddle and its forks, have proved ideal for moving the race route slightly lower and thereby solving the aforementioned problems. Several new variants of the Seventy were tried out within the next few years. The race has been held on the route shown on the attached map since 1987.

Bohumil Zemánek, the KRNAP Administration employee, enthusiastic skier and member of our national orienteering team, also put in a lot of honest and extremely valuable work at that time, along with many others. As a long-time member of the Organising Committee and an active participant in the Seventy on the one hand, and a ‘KRNAP man’ on the other hand, his dual role in the complex preparations for each year’s race was certainly not easy. But all is well that ends well! After a few years it was clear that the main problem with the original route had been resolved by devising a new route. However, this did not mean that this sporting event would not bring further trouble. The lower parts of mountains offered more stable snow

cover along most of the route, but this was never certain until the last moment. Will there be enough snow, will it be of high quality, will the weather will be good or bad on 'D-Day'? All of this is on the minds of the numerous organisers, as well as the entered athletes. The number of participants has been lower in recent years, as clear limits in this respect are set out in the necessary annual Ministry of Environment exception from *Act No. 114/1992 Coll., on the Protection of Nature and Landscape*. This act excludes arranging and organising mass sports, hiking and other public events and water sports in national parks, except in locations designated with the consent of the nature protection authorities. The granted exemption also states that the maximum number of competitors may not exceed 3,000 and that five-member teams (instead of the original ten-member teams) must set off on the approved race course at intervals of 20 persons per minute.

The technology for maintaining the tracks turned out to be a major problem, as the organisers did not have a suitable snowmobile with a blade width of optimally 3–4 metres, up to a maximum of 5.5 m. In particular, the preparation of the course on the leg of the race between Chalupa Na Rozcestí, Mt. Liščí hora and Liščí louka Meadow was causing damage to the dwarf pine vegetation, which was later the reason to move that section of the route onto the lower Liščí cesta Trail on the south-western slopes of Mt. Liščí hora. In recent years the race is run on a relatively conflict-free route. The change in the conception, organisation and route of the Krkonoše Seventy turned out to be a mutually acceptable compromise that not only solved most of the problems, but in the opinion of the competitors, even increased the sporting difficulty of this popular race. However, old-timers who were involved in the early years of

the 'Seventy', nostalgically recall the special atmosphere of the race, in which the primary aims were to participate and complete the course, no matter how long it took. Modern equipment and the competitors physical preparation has logically categorised the participants into those who compete for the fastest time (in the 57th race in 2012, the winning team time was an incredible 3.5 hours), and the majority of the competitors who respect and fully experience the collective rivalry and the corresponding social and moral atmosphere of the race. In recent years around 1,000 competitors in five-member teams have participated in the race, with individuals allowed to enter for the first time in 2012. How the future of the race will unfold, only time will tell.

It should be noted that for ordinary tourists on skis, Krkonoše represents a unique and readily available target (cross country skier numbers reaching one million per year). This corresponds to the long-term efforts by all of the people, who have invested many years of work into the search for a reasonable compromise between the use of the Krkonoše Mountains for tourism, and the protection of the Krkonoše National Park. The Krkonoše skiing paradise, or Krkonoše cross country trail, was the long-standing vision of many country skiers. Eventually, it was realised thanks to the patient and sincere cooperation between the KRNAP Administration and the Union of Krkonoše Municipalities. Nowadays, an 80-kilometre-long ski trail leads through our highest mountain range, beginning in Harrachov and ending on the eastern edge of the Krkonoše Mountains in Žacléř. Well-groomed trails and satisfied users of the 'Krkonoše Ski Highway' are proof that you can find a solution to the sensitive use of the attractive mountain landscape in Krkonoše and the protection of unique nature in the Krkonoše National Park.

20

Mt. Sněžka

Never-ending story

The triangular massif of Mt. Sněžka has attracted mountaineers, naturalists, artists, tourists and engineers for over half a millennium. It is one of the most remarkable mountain formations in this part of central Europe. Internet search engines almost immediately reveal millions of references to documents, in which the words Sněžka or Schneekoppe appear in all possible forms and phrases. These references mirror the countless events and stories, written by nature itself, but in recent centuries, primarily by man. However, our motives have not always been to recognise or express our humility and respect for the majesty of the mountains, but also our predatory efforts to use their natural wealth and conquer the peaks at any cost. The modern history of the highest peak in the Krkonoše Mountains and in Lower Silesia is a prime example.

The history of human traffic on Mt. Sněžka

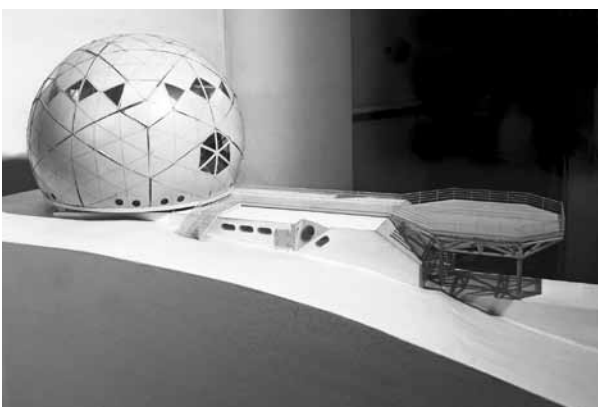
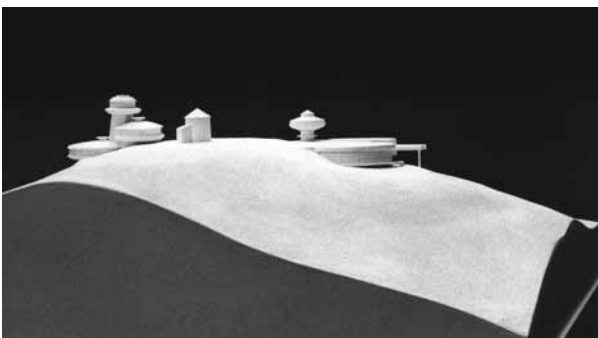
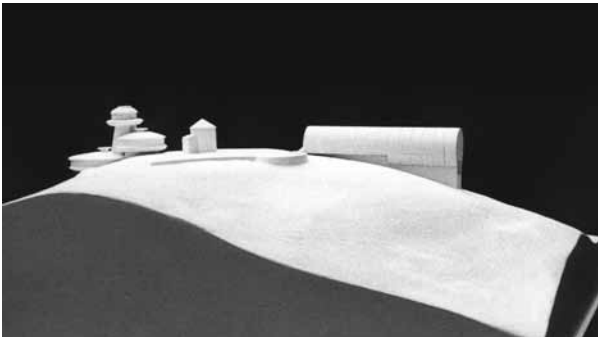
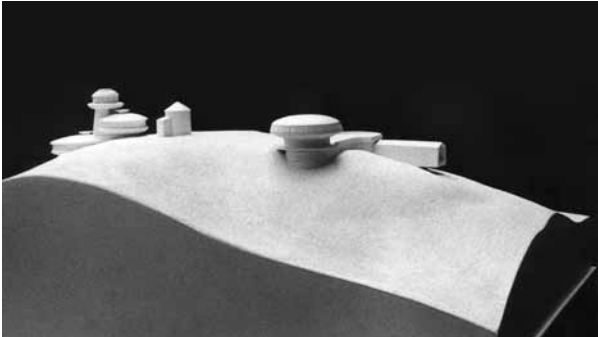
The earliest reports on ascents to the summit of Mt. Sněžka date from the 15th century. One of the first ascents was probably in the year 1456 by a Venetian merchant, who was seeking gold in the nearby Obří důl Glacial Valley. In 1569 Jiřík of Řásná measured the height of Mt. Sněžka at 2,035 m above sea level (!). The years 1665–1681 were busy on top of the mountain as the Silesian nobleman Schaffgotsch decided to build a chapel here. After the chapel was completed, it was dedicated to St. Lawrence, the guardian of underground treasure hunters. Large numbers of mineral excavation pits in the surroundings of Mt. Sněžka were mentioned at that time. Services were held in the Chapel five times a year, including the traditional St. Lawrence Pilgrimage in August. These were the beginnings of the popularity of climbing the highest Krkonoše peaks, and later of mountain tourism. Besides its religious function, the chapel already began to provide shelter from the weather; it became a sort of ‘sanctuary’ and later was even turned into an inn. However, the innkeeper Siebenhaar contributed to scientific knowledge, as



Mt. Sněžka today: priests in cassocks can regularly be seen here on St. Lawrence's Day (photo Kamila Antořová)

he carried out regular meteorological measurements on the summit of Sněžka. Trips to Mt. Sněžka had become a great tradition, as evidenced by entries in the the Visitor's Book (Koppenbuch). In 1833, the poet Karel Hynek Mácha climbed to the summit of Sněžka and drew on this experience in his famous work, 'The Krkonoše Pilgrimage'. The function of an inn passed to the newly-built Prussian Chalet in 1850 (renamed the Schronisko na Śnieżce, or Polish Chalet after 1945), which was supplemented on the Czech side of the summit in 1868 by the Bohemian Chalet, built by Hermann Blaschek from Pomezň Boudy. Both chalets could provide shelter for up to 300 guests! This duplicity started the manifestations of unhealthy competition between the mountain chalets,

which stood in close proximity to each other along the border between the Bohemian side of the mountains and the Silesian, Prussian, German and later Polish territory. Numerous attractions were operated on the summit of Sněžka, postcards and souvenirs were sold to tourists, the buildings on the summit provided accommodation and meals, supplies were carried here by mountain porters, especially the well-known Hoffer family from Velká Úpa. In 1900 the 18-metre-high wooden building of the meteorological station was added and Mt. Sněžka became a major international measuring site. During World War II all of the buildings served the German Army for military purposes, there was even a radio beacon on Mt. Sněžka.



Architectural variations: the new chalet on Mt. Sněžka with an integral chairlift station, 1987–1988 (photo Jiří Bruník)

1945–1989 The chairlift to the pilgrimage site

With the renewed boom in tourism after World War II there were proposals to build a chairlift to the summit of Sněžka. According to the memories of the Novák brothers, the administrators of the Bohemian Chalet, a route through the Lví důl Glacial Valley was considered, but priority was given to Pec pod Sněžkou. The initiative came from the Ministry of Trade and Transport, with the support of the Local People's Committee (LPC) in Pec pod Sněžkou. The first plan placed the chairlift route from the chapel in the Obří důl Glacial Valley towards the Obří bouda Chalet (middle station), and then to the summit of Sněžka. Obří důl was saved from this devastation by the great resistance from naturalists and conservationists, for which reprisals followed later – the ruthless persecution of Joseph Šourek, an outstanding botanist and conservationist, as well as many other important personalities. The investor soon pushed through the current route through the Růžový důl Glacial Valley, across Mt. Růžová hora, and up to the summit of Sněžka. The construction was authorised by the Ministry of Education (then the umbrella organisation for nature conservation), in spite of great protests by prominent personalities, and the chairlift was built in 1947–1950. Significant damage was done to spruce and dwarf pine growths during its construction and the upper parts of the Sněžka massif were subjected to gross interference.

The existence of a chairlift on the Czech side immediately provoked great pressure from the Polish public to construct a chairlift from the Łomniczką Valley to the summit of Mt. Sněžka. Fortunately, this was prevented but in 1959 a chairlift was built from Karpacz only as far as the summit of Mt. Kopa (1,377 m above sea level). In the spirit of the slogan of that time 'The Mountains Belong to the Workers', the following years saw a huge increase in the number of visitors to the whole Sněžka massif (thanks to both chairlifts and the restaurants on the summit of Sněžka), unfortunately with all the accompanying adverse impacts on the vulnerable nature of the Krkonoše arctic-alpine tundra. Its uniqueness has already been described in dozens of scientific papers; as the unique plant and animal communities living in a colourful gallery of frost



Pilgrimage variation: Ascent of Mt. Sněžka by Pioneers and Youth, 1980s (photo Jiří Bruník)

and ice shaped landforms exceed local, regional, and even national significance. In this respect Mt. Sněžka is an irreplaceable natural treasure trove of Europe. Such uniqueness, combined with relatively easy accessibility, makes Mt. Sněžka a pilgrimage place, which, for many reasons attracts hundreds of thousands of visitors per year. This is a contradiction; the solution to which was not, is not, and will not be easy to find.

Under the supervision of two national park administrations

Unfortunately, even after the establishment of two national parks (KPN in 1959 and KRNAP in 1963) not much has changed. Insufficient legislative powers, lack of funding and also the considerable lack

of interest by the superior authorities and institutions mostly paralyzed the efforts by conservationists to protect the unique values of the Krkonoše Mountains – society was paying for it and at the same time criticised it! And so the destruction of historical trails leading to the summit of Sněžka, damage to the surrounding relief and plant communities, and the accumulation of various waste continued. When the damage caused by air pollution was added, the mountains seemed to be facing a very bleak future. Society was unerringly led by the Communist Party (CPC), which still advocated the idea of ‘comprehensive development of the Krkonoše Mountains’, and the building work was endless. Totalitarian and megalomaniac monuments such as the Horizont and Horal hotels were built and further abominations were to be built soon – on the summit of Mt. Sněžka. Plans were tabled to build a new chairlift and Czech Chalet in the 1980s. Both of the original facilities had deteriorated rapidly. In particular, the chairlift had become an obsolete technical monument. Based on recommendations by the KRNAP Administration itself (!!!), the projects were even given the blessing of the Ministry of Culture, which gave its approval for the construction in the strictly protected state nature reserve in the heart of the national park in 1987. This happened during the era of the last pre-revolution Director Ing. Vladislav Černošávek who sang the same song as all other comrades from the districts, regions and central authorities. What followed was an agitated and unfortunately mostly heavily manipulated discussion on what is more harmful for Sněžka – hikers on foot, or hikers transported on a cable several metres above the ground. Unfortunately, this discussion took place in the spirit of the very short-sighted and eternally harmful philosophy of “He who walks a tight-rope, does not step on anyone’s toes; he who does not struggle, does no harm; he who sits in the pub, also does no harm”. Scientists and conservationists were shocked by the project and despite the normalisation atmosphere of the 1970s and 1980s, put up intense resistance to it. The project to build a spherical polygon, a kind of hemisphere partially recessed below the surface of the summit of Sněžka, was soon challenged and rejected. At the time, it was anticipated that the Czech Chalet and top chairlift station would be merged into a single object. Another project with a similar concept was strongly promoted in the years 1988-89, this time in the form of an elongated cylindrical object, also partly recessed, by Stavoprojekt Liberec (Studio 2 SIAL). This project was not of such



Combined trench for water pipes, electricity and telephone cables, 1974. Although the shallow trench was covered with rocks, it can be seen clearly again today (photo Jan Štursa)

a high quality as others by this studio, such as the Transmitter/Hotel on Mt. Ještěd. The official position of the Administration is documented in the article 'Planned Construction on Mt. Sněžka', *Krkonoše* No. 8/1988.

It should be noted that by this time the new Polish Chalet, in the form of three discs, containing a restaurant, a meteorological station and support facilities for their operation, had been open for more than a decade. Then the aforementioned competitiveness between Czech and Polish institutions erupted again.

The fourth glacier

If the triangular shape of Mt. Sněžka is the result of millennia in the dominions of frost and ice, and the existence of three glaciers on its slopes, the strongly destructive activities of a fourth glacier have appeared in recent decades, as Čestmír Klos, the well-known publicist and long-time protagonist of efforts to save the values of Mt. Sněžka aptly named one of his articles. He proclaimed that man had assumed the role of the fourth glacier. Man, who despite his small stature, but under the guise of all sorts of great goals, was trying to gnaw away at Sněžka stone by stone, from all possible and impossible directions.

Mt. Sněžka became a significant political issue in Czechoslovakia at that time. Members of Government and the Regional Commissions for the Comprehensive Development of Krkonoše, the Communist Party authorities, Interhotel Krkonoše, architects, chairlift operators, the Pec pod Sněžkou Local National Committee and, unfortunately, the director of the KRNAP Administration stood in battle array against the members of top scientific institutions (Messrs Hadač, Jeník, Stoklasa, Hudec and many others), members of the Ecological Section of the Biological Society of the Czechoslovak Academy of Sciences (CSAS), as well as many cultural figures – such as writer Marie Kubátová, who openly criticised the building plans in the 'Tvorba' weekly (the official cultural newsletter issued by the publisher of the *Rudé právo* newspaper) and later, in 1992, the period atmosphere was captured in the book the 'The Ballad of Sněžka'.

An important role was played by the KRNAP Administration staff themselves (scientists from the Department of Conservation and the Museum of Krkonoše Department). They produced an analysis of serious threats to the unique natural values of Mt. Sněžka in case of implementation of the proposal, including alternative solutions. After it was published in the daily press and journals, we managed to rouse the public to a national debate, which was unprecedented at that time. Despite the personal risk, the KRNAP staff began to publicly criticise the Director Černošlávek for his support for plans to implement the project. Extremely heated and polarized debates between scientists from the Czech and Polish institutions and Director Černošlávek broke out at a joint meeting of the Scientific Councils of both national parks at the Samotnia Chalet, directly under Mt. Sněžka. Even this did not help. Information on the fate of the highest Czech mountain reached the reports of the foreign radio stations Radio Free Europe and Voice of America via the signatories of 'Charter 77' and the Ecological Section of the Biological Society of the Academy of Sciences. In this way the Sněžka affair also contributed to the resistance against the power politics of the CPC. Unfortunately, even with all the risks and impacts.

The all-powerful State Security (secret political police) entered the game and many of us had the opportunity to become familiar with its practices. This story, which seems trivial today, but was typical at that time, took place in connection with the forthcoming debate, which was to be held in the summer of 1989, and broadcast



Repairing the damaged surroundings of the trail was very labour-intensive, but it was the only possible way. Afterwards, the repaired sections were exclusively seeded with local montane grass species. The necessary construction materials to stabilise the repaired trail were transported to several points on the slope by helicopter, before the trail repairers gradually moved it on by wheelbarrow. The metal fronts of the steps were secured in place by a clever system of belts fixed into the bedrock. Then the pavement was built of pitched rocks and a binding layer of soil was spread over the surface (photo Jan Štursa)



Before the start of the reconstruction of the trail from Mt. Růžová hora to the summit of Mt. Sněžka, this extremely busy tourist pavement was badly damaged by soil erosion and the trampling of montane vegetation. The dry conifer branches were intended to stop tourists from leaving the trail body. This measure was not very effective! (photo Jan Štursa)

live from the overcrowded swimming pool area in Dolní Sejfy under Rýchory. We arrived there in Čestmír Klos's Trabant, accompanied by Marie Kubátová, and during the afternoon there were meetings of the spokespersons of all parties interested in Sněžka. The live coverage and topics for the debate were prepared, a jingle was broadcast to introduce the popular radio programme 'Mikroforum' and then ... nothing. A few seconds before the presenter asked his first question, the broadcasting equipment fell silent. Later, they found that someone had intentionally damaged all the communication links along the road to the pool. The party apparatus had such a strong fear of public radio debate imprinted on them by the state bureaucracy, which unfortunately reached up to the post of the Deputy Prime Minister Ing. Jaroslav Tlapák.

The social and political atmosphere in the autumn of 1989 was not developing according to the wishes of the ruling powers, and thus the efforts of the investor (Interhotel Krkonoše) to commence work according to the project eased off. Then, when we had almost given up hope, an unexpected thing happened – in spite of all the expert reports submitted, the Ministry of Culture issued a decision on 22nd November, 1989, not to grant an exception to allow the construction of the Czech Chalet on Sněžka and a chairlift from Pec

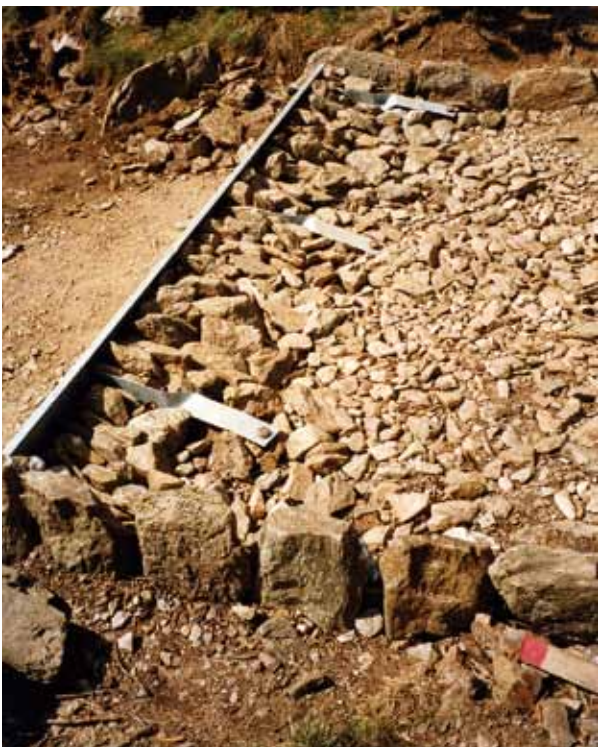
pod Sněžkou to the summit of Sněžka in the Prameny Úpy State Nature Reserve. Three weeks after that, Interhotel Krkonoše resigned from the role of investor, Stavoprojekt Liberec renounced its role as the general architect and Ing. Černohlávek was soon removed from office as Director of KRNAP. Despite the enormous social and political changes that our society underwent at that time, it was soon clear that further steps to protect and rationally use the Krkonoše Mountains would be very complicated.

1990–2012

After the Velvet Revolution stormy debates about Sněžka broke out at all levels of our society. Politicians came and went, and many of them left their imprint on the future of Sněžka. From the regions up to the highest government positions, each of the actors in these causes tried to convince the others that their solutions were the best for our highest mountain. Mt. Sněžka started to be a touchstone for managerial skills, mastering compromises, the application of democracy, but also demagogy, serving to slander the troublesome or promote the ambitions of others who use the power of money or political power. It was, and for a long time will truly be, a political mountain.



The system of transverse kerbstones and lateral drainage trenches prevents the erosion of construction materials from the pavement, by reducing the erosive strength of the surface water after heavy rain or from melting snow. However, regular maintenance work by the mountain trail builders is necessary to keep the pavement in good condition (photo Jan Štursa)



Winding paths to the summit

The 1990s brought an era of intense business, construction activity, and the search for new values of life, to the Krkonoše Mountains, as well as the difficulty of formulating and promoting the optimal ideas for which path should our oldest national park should take. The KRNAP Administration staff started to learn how to handle their new powers, but also the responsibilities that the Act on Nature and Landscape Protection in the Czech Republic from 1992 brought them. Direct management of this conservation institution by the Ministry of the Environment greatly accelerated the previously lengthy planning processes and the party bureaucracy of regional and national commissions and committees, which decided on the fate of the Krkonoše Mountains until 1990. On the other hand, this also brought a significant risk of political lobbying across the spectrum of the newly forming society, new political parties, new ministries and their officials and jurisdictional disputes between different departments. Frequent changes of staff within state and local government bodies, in the Krkonoše region in particular, also brought negative influences.

From November, 1989 onwards, any new construction activity on the Sněžka massif was excluded because the conditional approval of the nature conservation authority would only be granted via an exemption from the valid legal provisions. And such exemptions were not granted. Nevertheless, the highest Czech mountain was still accessible to tourists without limitations, whether they trekked to the summit by any route or used the old, but still functional, chairlift from Pec pod Sněžkou. By that time the Czech Chalet was already closed for hygienic reasons and it deteriorated rapidly in the extreme climate of the summit of Sněžka. The condition of the hiking trails was also deplorable, and so the two national park administrations embarked on their reconstruction. It was not easy to agree on the technique for repairing the trails and certainly not on the final surface treatment of the trails. Conservationists had long discussions with the Krkonoše Mountain Rescue Service, as the law required that such modifications do not reduce the safety of hikers, especially during the winter months when the surface of Sněžka is often icy and extremely dangerous. The trail builders tried several types of granite aggregates, while a short stretch

of trail from the chairlift station to Mt. Růžová hora was even reconstructed using large granite stones. This did not turn out well, because the poor supervision of the construction company had the effect that the stones were not laid dry according to the project, but were grouted with concrete. The surroundings of the repaired section were damaged, so the KRNAP Administration and the author of this article (its first post-revolution director at that time), were frequently subjected to sharp criticism in the press.

During our search for the most appropriate reconstruction techniques for damaged trails, we approached the newly established Klimeš construction and engineering company from Horní Maršov. They managed to cope with the harsh natural conditions on Mt. Sněžka and the required building conditions. Miloslav and Pavel Klimeš chose a proven method used by generations of old mountain trail builders – ‘stone pitching’. To overcome the high gradient they had to use a system of raised levels (steps) at regular intervals to gradually climb the almost 250-metre elevation from the southern saddle between Mt. Růžová hora and Mt. Sněžka.

The newly-built mountain pavement (initially visible only from Trutnov) immediately divided the public into two camps: those who praised the trail, and those who criticised it for various reasons. The construction materials, suitable stone and backfill soil fractions, were a major problem. Although Sněžka is a stone mountain, using the periglacial scree and boulder scree that cover its slopes for trail building was absolutely taboo. This is because they provide remarkable testimony to ancient natural processes and as such are strictly protected. Therefore, hundreds of tons of materials, which environmentalists chose carefully, so as not to affect the chemical composition of soils in the high mountain conditions, were brought in from relatively distant locations. The considerable expense of restoring the pavement to the summit of Sněžka definitely paid off and today nature itself is gradually healing the grievous wounds that were inflicted on the slopes of Sněžka by an excess of tourists, soil erosion and the previous long periods without adequate trail maintenance. Meanwhile, the Klimeš Company has become well-known in the region for their precise work on dozens of other projects to rescue the mountain trails and historical monuments in Krkonoše.



The overall appearance of the repaired trails is improved by the lateral stone walls, which are also effective in the fight to keep the tourists from straying away from the trail (this is the First Zone of the national park, with the strictest protection regime). The Česká bouda Chalet is still standing... (photo Jan Štursa)

So the trail to the summit of Sněžka began to fulfill its mission, but the situation on the actual summit was not so rosy. The obsolete chairlift, the closed Czech Chalet, the Polish Restaurant with limited capacity, inadequate wastewater treatment, as well as problems with the payment regime – this was a great package of problems to solve.

If a pub, then on a hill with a chairlift

As soon as the new Town Council took control of Pec pod Sněžkou, they started to promote their demands for the reconstruction of the old, and the construction of a new, chairlift, and to rescue or re-open the Czech Chalet. Fierce arguments broke out between the town councillors and the KRNAP Administration over the future form of both facilities. The citizens of Pec and their elected

representatives defended the vision, that the development of the town without the chairlift and the Czech Chalet, was unrealistic and the loss of tourists would not bring the necessary financial revenue to the town. On the other hand, the environmentalists tried to convince them that development of this famous resort needed to be based on visitors, who do not visit for one day, but spend more time here. This was, however, dependent on a tempting and varied range of different outdoor activities, cultural facilities, and of course, a high quality of services. The clashes between these two completely different visions were familiar in the course of the endless negotiations which took place around Sněžka in the 1990s. At that time, the 'Sněžka Expert Group' was founded, holding regular meetings and discussions with representatives of the Ministry of the Environment, KRNAP Administration, the town of Pec pod Sněžkou, Sněžka Cableway Company and the Czech Association of Cable Car and Chairlift Operators, which initiated the establishment of the

group. Quite a fierce media war then took place, during which a decent and objective manner was not always maintained. The chairlift to Sněžka was not exempt from the privatisation circus and after various political and financial earthquakes, the town of Pec pod Sněžkou became the new owner, after paying a large sum in compensation to the second actor in the privatisation process (the village of Malá Úpa).

In 1994, after Oldřich Lábek took over as the new Director of the KRNAP Administration discussions started on a new alternative solution route for the chairlift, with a lower station near the dam in the centre of Pec, intermediate station at Růžohorky, leading towards Mt. Růžová hora and along the existing route to the summit, or below the summit, of Mt. Sněžka. There were requests to build a new ski resort on the southwestern slopes of Mt. Růžová hora. This new solution was strongly promoted by Mayor Tomáš Paduch, for whom it could be a trump card in building a political career. The idea of reopening the Czech Chalet was raised again, not on the site where the abandoned and dilapidated building stood at the time, but by combining it with a new upper chairlift station below the summit of Sněžka. According to Act No. 244/1992 Coll., the town of Pec pod Sněžkou had to ensure the processing of EIA documentation, which would analyse all possible impacts of several variants of this investment project on the environment. The documentation was compiled by Karel Houdek from the Institute of Applied Ecology and Economics in Kostelec nad Černými lesy and I should add that after its submission there was intense embarrassment. After justified criticism from the Ministry of the Environment and the KRNAP Administration, it was not eventually used and only lost the town of Pec pod Sněžkou time and money in the process of finding paths towards further development of the town.

At that time the KRNAP Administration staff compiled and presented a multi-criterion analysis entitled 'Carrying Capacity of Mt. Sněžka', in which four basic options for access to Sněžka were assessed. This analysis became the fundamental basis for the work of the Expert Group and was challenged by all the participants in the long-term causes; the KRNAP Administration Scientific Council and the Ministry of the Environment (see *Nature Protection* No. 7 and No. 8/1997). For another 15 years it was referred to,

from various angles, by conservationists, ministry officials, owners and operators of the Sněžka Cableway Company, citizens and representatives of Pec pod Sněžkou, but also members of the public who follow the events around Sněžka. How many events have taken place around Mt. Sněžka since then! The case of Mt. Sněžka has been a touchstone several times during municipal elections, and is a challenge, but also a frightening nightmare, for the budget of Pec pod Sněžkou, in terms of how quickly and from where to obtain enough money for potential projects; for the KRNAP Administration it is a question of compliance with the fundamental principles, which were the basis for the declaration of Krkonoše as a national park. The list of reasons why the fate of Mt. Sněžka reflects the ambivalent attitude of society to the natural heritage of our country could be never-ending. A proposal to declare the Czech Chalet as a national monument was presented to the Ministry of Culture by the 'Foundation for the Preservation of the Czech Chalet on Sněžka' in 1992, but was unsuccessful. A survey of the building showed that the structure was in poor condition and had suffered irreversibly damage from dry rot. After the complex privatisation was completed, the chalet was eventually demolished in 2004 (the demolition was carried out by the Klimeš brothers) and the site was later adapted for the planned Czech Post Office building.

And what about the chairlift itself? After years of negotiations between the KRNAP Administration, the owner (the town of Pec pod Sněžkou) and the operator (Sněžka Cableway), a compromise solution was reached for the extensive reconstruction of the chairlift. This was subject to a considerable number of conditions, which the KRNAP Administration imposed (in the spirit of the document 'Carrying Capacity of Mt. Sněžka'), in order to protect the massif of our highest mountain from more serious damage. Construction of the new chairlift was begun in the autumn of 2011 and should be completed in 2014.

There is still an inn on Mt. Sněžka and it is likely that in the coming years the only one will be on the Polish side of the summit. However, when the border only symbolically bisects the highest mountain, the problems that used to discourage Czech tourists from entering the Polish booth, have been overcome. Only one problem remained – wastewater treatment. It has been temporarily solved by a bicameral septic tank on the rocky northern slope of Mt. Sněžka. But

this is an obsolete and ineffective system and poses a risk of a potential environmental disaster that could be tragic for the nature on Sněžka. Therefore, the activity by the directors of both Krkonoše National Parks to find a modern, joint solution to wastewater treatment is extremely gratifying. Plans are currently being formulated to lay a new power line to Sněžka from the Polish side. It should be laid under the Jubilee Trail and the problems with modern sewerage and water pressure should be solved at the same time. When the project is prepared and negotiated (including the protection opinions of both NPs), funding for this project will be sought.

Dandelion, speedwells and other jewels

The Sněžka Cableway Company began the construction work for a modern chairlift in the autumn of 2011. Work has only begun on the lower section so far, as the upper section between Mt. Růžová hora and the summit of Mt. Sněžka will be much more difficult. The project has passed through the EIA process and construction activities will be adapted to the requirements of environmental protection as much as possible. But reality often brings unforeseen complications, so there are great advance concerns about how everything will be done (even when sufficient finance, technical resources and experienced people are ensured). Will the weather be kind to the builders? Will all of the legitimate demands for quality technical support and labour be met during the construction? Even a slight offence against the approved procedures may have fatal consequences for the nature on Mt. Sněžka.

An example of such an unforeseeable risk occurred during necessary repairs to the dry-stone plinth of the St. Lawrence Chapel from the 17th century. During one of our visits to the summit of Mt. Sněžka, we found that some workers from a Polish stonemasonry company were repairing the plinth. They were progressively dismantling, cleaning and re-assembling it. It seemed like a job well done to us, until we found dozens of clumps of the unique Krkonoše Dandelion (*Taraxacum alpestre*) on the pile of removed rocks and soil. This is a Krkonoše endemic species, and its largest population grows right on the summit of Sněžka. Gardeners know very well how

obstinate dandelions can spread to their surroundings and occupy more and more space by way of their downy achenes. However, this endemic dandelion chose the crumbling plinth for its dissemination and the windblown seeds germinated in the soil between the rocks. They also grew on the high stone plinth on the southeast side of the former Czech Chalet. In case of the repairs to the St. Lawrence Chapel we managed, by coincidence and at the last minute, to prevent the accidental destruction of this rarity of the Krkonoše plant kingdom by replanting the uprooted clumps of dandelions to another place below the summit of Sněžka. A few years later during the demolition of Czech Chalet everything was done in advance and the stone plinth remained part of the new building.

But it is not only about the Krkonoše Dandelion, because the summit and the edge of the nearby rocky cliffs are the only Czech locality for the critically endangered Daisy-leaved Speedwell, the unique Spiked Wood-rush grows here and the rare Alpine Accentor also nests here. I will not mention all of the jewels which were created in this dominion of frost, ice and wind over hundreds of thousands of years. All of them will be unconditionally respected in the next few years, when the construction industry returns to Mt. Sněžka.

Stamp of the Czech St. Agnes Post Office

The structures which should disappear from the summit of Mt. Sněžka included a small wooden kiosk from 1936, formerly dubbed the 'Gingerbread Cottage'. It had been operated as a post office since 1994, and also provided refreshments. As its demolition approached, a huge wave of protests erupted in the spirit of "an eye for an eye..." and plans were made for a new post office. The architects Rajniš and Hoffman presented nine variants for the design of a new building and immediately ignited a national debate, which greatly resembled the atmosphere before the construction of the 'saucer-shaped' buildings on the Polish side of Sněžka. The KRNAP Administration, as the owners of the land were also involved in the negotiations – after all, any construction activity here is a source of danger to the unique natural phenomena. Every square centimetre above



...and here it is dismantled and packed away. The helicopter was an invaluable helper during the demolition of the rundown Česká bouda Chalet and the following recultivation of the terrain by the workers of the Klimeš Construction Company. (photo Kamila Antošová)



The Czech Post Office is still in operation, despite certain technical and financial difficulties. The building was bought from the investor by a new operator before the 2012 season. (photo Kamila Antošová)

the ground and below it was fought over. Discussions centred on its architectural expression, functionality, placement, elevation, the range of services offered, etc. The result is known to everybody who has visited the summit of Sněžka since 2007. It is an avant-garde architectural achievement and probably only time can tell whether this building, with this conception and in this place, should have been created or not. Fortunately for the nature, it is easily removable, as is only anchored to twelve concrete footings above the surface of Sněžka. From this perspective, it is a truly green building. The Czech Post Office provides snacks, postcards and informational materials about the Krkonoše Mountains and there are views in all directions from the roof terrace. The old kiosk was sold, dismantled and rebuilt under the name of the Czech Post Office near Sedlec-Prčice.

Political Mountain

In its recent history, the highest peak in Krkonoše is not only a destination for millions of tourists from all corners of Europe, but also a place of pilgrimage for leading politicians, or at least, a place where they gathered their thoughts while dealing with political tasks. Under the former regime dozens of officials travelled on the occasion of the annual Ascent of Mt. Sněžka by Pioneers and Youth. During the normalisation years, however, the leaders of political dissent from the Polish-Czechoslovak Solidarity movement often travelled around Mt. Sněžka and along the border ridges and their planned conspiracy meetings provoked the Secret Police and the State Border Guards into action. The Charter 77 signatory Dáda Fajtllová

from Malá Úpa could tell a few stories from this time. Petr Pithart, a former Czech Prime Minister, MP and Senator, and another Charter 77 signatory, was active in the Krkonoše Mountains for a short time in the 1980s. He was one of the clandestine authors of a sociological survey of visitors to the Krkonoše Mountains, conducted under the auspices of the former Institute for Cultural Research. In his essay entitled 'Mountains on the Way to Mohammed', he aptly described the devastating and utterly selfish attitude of our society to the phenomenon known as Krkonoše, including its highest mountain. I cannot help thinking what has actually changed in our approach to the mountains during the last 30 years? It makes me sad!

One of the border crossings to Poland – Pomezní Boudy – stands at the easternmost foot of Sněžka. A meeting took place here in September, 1990, during which our former president Václav Havel, accompanied by Jiří Dienstbier, Jiří Ruml and other Czech and Polish friends and former political dissidents, removed the chain from the border barrier and symbolically opened the border.

As the demolition of the Czech Chalet and the privatization of the chairlift approached, politicians of many different political affiliations got involved in controversies over Mt. Sněžka, including the Czechoslovakian Minister of Trade and Tourism, Vlasta Štěpová, or the then (1993) Czech Minister Transport, Jan Stráský,

subsequently the Director of Šumava NP. As an active hiker he supported the KRNAP Administration's vision that visitors would only travel to the summit of Mt. Sněžka on foot, and that the chairlift would terminate on Mt. Růžová hora.

Over the past 20 years the St. Lawrence Chapel, which has stood on the summit of Mt. Sněžka since the 17th century, has become a traditional meeting place for the faithful on the St. Lawrence Pilgrimage in August. It gets pretty busy on the small summit plateau and there are no lack of prominent personalities from religious and political life present. Former President Václav Klaus, who travels here on foot, either from Pec or from Pomezní Boudy, was also a frequent participant. This could be a great example for our consumerist society on how to further perceive Krkonoše and Snežka. It could have been, but was not, because his opinions on the development of the Krkonoše Mountains are unfortunately too one-sided, focussed only on the perspective of thriving businesses and a well-functioning economy. Which nature protection 'prevents', and so conservationists are not among his favorite groups of people. Nevertheless, it was his credo – to climb the highest hill on foot – which could be a symbolic point for our meditation on the fate of Mt. Sněžka. Climbing mountains and discovering their values, whether natural or spiritual, should be subject to ethics and humility to the environment, in which we humans are only short-term guests, but not omnipotent conquerors.

21

On the Relationships between Man and the Krkonoše Nature

We have not tried to present a comprehensive overview, because the history of the first Czech national park is too eventful for this. If the reader has learnt that not all interactions between man and the protected nature in the Krkonoše Mountains, in times ancient and recent, happened in harmonious agreement, the author's intention has been achieved. Finally, I would therefore like to emphasize, or rather generalize, some fundamental principles, knowledge and various levels of relationships between man and the mountain nature.

Man in the role of conqueror

Man has modified his relationship to mountain landscapes over the centuries, in accordance with the course of events in the outside world. The initial respect for the wild environment of impenetrable mountains slowly faded as man penetrated deeper into the mountain valleys or mined under the mountains and as he discovered more and more of the values of the environment. The woodcutter, glassmakers and mineral prospectors took on the roles of farmers and herdsmen, whose activities have left their traces from the foot of the mountains up to the highest ridges. Later, the mountain chalets and the trails between them were increasingly brought to life by short-term visitors. Tourism, with its service providers and visitors of various nationalities and interests, became the modern conquerors of the Krkonoše landscape.

As the annual visitor numbers swelled greatly, the widening trails whittled away more and more of the mountain meadows and forests, the former chalets have slowly changed into large-capacity recreational facilities, the forest complexes have been fragmented by the logging road network, as well as the increasingly dense network of ski slopes. The tourist resorts in the valleys are today a teeming mass of new and ever larger buildings, for many winter months the artificial snow on the ski slopes is illuminated long into the night by hundreds of powerful spotlights.

Apartment complexes, cars, quad bikes, snowmobiles and snow groomers, gangs of blueberry pickers – that is, unfortunately, today's reality of the exploited (or already



The state border line runs all the way along the mountain ridge. The photo shows it in the dwarf pine growths beside the Schustler Trail (photo Kamila Antošová)

conquered?) Krkonoše Mountains – the oldest national park in the Czech Republic. I often recall the famous vintage postcard from the early 20th century, which expressed a futuristic vision of Mt. Sněžka in the late 20th century. We are in the 21st century and is the reality really so bad? Fortunately, on Mt. Sněžka it is not, even if true history of this place of pilgrimage for the whole of the Krkonoše Mountains is a classic example of society's spirit of conquest. However, if we consider the whole of Krkonoše, then we cannot help but ask, how many new buildings, beds, people, trails, cars, ski lifts, ski slopes, can still fit in this small mountain range? What is still bearable in the intimate area of Krkonoše before the stability of the local mountain landscape collapses? When will people cease to love being in the mountains, where they are almost breathing each other's air, where instead of physical and mental well-being and relaxation in the quiet mountain forests and on flowering mountain meadows, they can only expect to find an analogy of the unhealthy environment of the cities and industrial landscapes below the mountains, from whence they wish to escape for a while?

Many years ago we were not able to understand why a wide ploughed border strip ran along the mountain ridges, with guards patrolling and tracking the footsteps of 'state border violators' from the two friendly states. The dwarf pines, mountain grasslands and the arctic peatbogs had to yield to nonsensical political ideology, jittery about the sovereignty of the Socialist Bloc countries. This did not help at all, but the strip is still visible, and will be for at least the next century, as a testament to human foolishness and possessiveness.

A little later, in many places in the Krkonoše Mountains the tumultuous waves of constructing or reconstructing buildings for the purposes of mass recreation began. Hectares of flowering mountain meadows had to give way to monuments of the Hotel Horal and Hotel Horizont type. An example might be the once idyllic Svatý Petr valley, where a dense network of asphalt roads and the supporting infrastructure for the multitude of hotels have swallowed up more than a third of the landscape, with its typical mountain architecture, over the past fifty years. And now the owners of hotels and



Apartments have filled most of the open spaces in the centre of Pec pod Sněžkou (photo Kamila Antošová)

guesthouses are worried about how, and with what, to lure clients and at least partially fill the unnecessarily high bed capacity.

Billboards on the outskirts of Prague already advertise the sale of luxury apartments, which have sprung up like mushrooms after the rain at various localities in Krkonoše, but which are left empty for most of the year. The case of Horní Mísečky is a shining example of the modern conquering hysteria that has afflicted Krkonoše and other mountain ranges, just like on the coastline, and is a vivid example of the myopic, and unfortunately, also of the greedy approach of today's consumerist society towards the values of this unique landscape. Less is often more. This is a path towards leaving the conquering philosophy of contemporary society and towards seeking reasonable compromises around a common table, between all of the businesses which operate in the Krkonoše Mountains National Park. Before it is too late, before nature starts to fight back, as is happening in many places on our planet.

Nature in the role of a strong adversary

Although the increasingly frequent reports on the rampaging of destructive windstorms or earthquakes or tsunami scare us, we calm down again immediately, as they are far away from us here in the middle of Europe, they do not bother us so much. Yet even in such a small and low mountain range as Krkonoše, the forces of nature can show their power and dominance over man. This almost always happens after



Car park at Horní Mísečky, with apartment blocks in the background (photo Kamila Antošová)

we have inconsiderately interfered with natural processes. After we cut down the mountain forests, there have been repeated large floods and landslides, which took houses and human lives. Those who did not respect the old mountain folk's years of experience and built a new dwelling too close to a mountain stream or on steep and unstable slopes, repeatedly worry during every torrential rainstorm in recent decades. Many tourists in the Krkonoše Mountains, who underestimated the dangers of its snow cover and mountain weather, ended up under avalanches or froze to death on the mountain ridges, often close to the chalets, which they did not manage to reach in strong wind and thick fog. Dozens of records of preventable deaths are placed in the chapel at Modré sedlo, near the Luční bouda Chalet.

Strong winds take their toll every year, in the form of thousands of cubic metres of timber in the damaged mountain forests. Then we begin to question the correctness of the older decisions to build facilities, such as the ski jumping complex in Harrachov. The organisers of the Ski Flying World Cup competition are nervous until the last moment, fearing that strong winds will prevent the event taking place. Even here, man grossly underestimated the natural conditions, and nothing is changed by the fact that the forests near the Harrachov 'Giant Hill' fell victim to air pollution and insect calamities at the end of the last century. Indeed, a number of the consequences of air pollution dieback of mountain forests in the Krkonoše Mountains again have their origins in man's insensitive cultivation of landscape and nature, even though they happened in the broader context of the 'Black Triangle', the most strongly polluted area on the borders of the Czech

Republic, (East) Germany and Poland. The current regeneration of mountain forests, including the return of many important mycorrhizal fungi in the forest soils, only testifies to the strength of natural processes which are linked to the restoration of mountain forests damaged by air pollution, and which have been successfully supported by foresters and conservationists who implemented modern care for the Krkonoše forests.

In my first years of working for the KRNAP Administration, I worked hard to defend every branch and every dwarf pine bush in the surroundings of the hiking trails from deliberate damage by humans. The vitality of the dwarf pine vegetation decreased during the air pollution crisis. Lately, however, I have also had to rethink my 'ecological' patriotism on the basis of long-term monitoring of these remarkably resilient Krkonoše trees. The dwarf pines growing along the trails are much stronger adversaries against the thousands of tourists who hike around their branches and damage them. The dwarf pines successfully survive this and their branches will eventually start to grow across the trails, forcing the tourists out of the designated corridors. Unnecessary damage may then be inflicted on the flora, fauna and inanimate nature. Therefore, an entirely appropriate and sensible compromise among tourists, conservationists and the dwarf pines is to clear the trails from time to time - gently and with a good knowledge of the biology of this species - by removing some of their branches.



Hotel Horal in the Svatý Petr valley is sometimes nicknamed the 'Titanic'. The brutal aesthetics of this concrete dominant have been softened in recent years by the trees growing in the surroundings (photo Kamila Antořová)

However, the 'Dwarf Pine Case' contains a number of different problems - environmental, legal, ethical or psychological. These were also manifested in the turbulent media reaction to the recent pruning of the excessively dense dwarf pine plantings on the mountain plateaux of western Krkonoše. The dwarf pine is still a protected woody plant, so why has the KRNAP Administration itself begun to thin it out? It belongs to the priority ecosystems that are under the legislation of the Natura 2000 network, so it was not easy to prepare a legally flawless project for pruning the dwarf pines, or to find a reasonable form for its implementation. We have written about this issue many times on the pages of the magazine *Krkonoše + JH* (No. 7 and No. 9/2010, No. 10/2011).

I mention this because it is not always easy to make the right decisions, especially in the case of the territory of a national park. The lifecycle of mountain nature becomes apparent, for example, in the spontaneous return of trees on mountain meadows, which for various reasons, were left without regular care. Our ancestors, who expended considerable effort to establish the treeless meadow enclaves, undoubtedly contributed to the overall biodiversity of the Krkonoše landscape, even at the expense of the forest area. Would it be proper in such cases, to leave the protected territory of the national park without intervention, without sensitive management? Many would certainly answer in the affirmative, as non-intervention is the 'raison



Sídliště Bedřichov housing estate. Three tall blocks of flats no longer serve for permanent residence, but for recreational visitors. Densely-packed concentration of family guest houses neighbour on to the housing estate (photo Kamila Antořová)



The ski jumping area in Harrachov. The artificial barriers which protect the ski flying competitors from gusting winds will not be necessary in the distant future when a new forest grows on the upper slopes (photo Kamila Antošová)



Ski area in Svatý Petr. The wide downhill ski runs have divided the formerly dense forests into fragments, which were more vulnerable to the effects of strong winds and insects after the emission calamity (photo Jan Štursa)



Thinning out the dwarf pine growths on the Labská louka Meadow. It is very difficult to explain why the recently planted dwarf pines should be thinned out, while other, natural growths are still strictly protected (photo Jiří Bašta)

d'être' of a national park; nature is strong enough to look after itself. Meadows are once again replaced by forests. However, how should we maintain the biodiversity on the mountain meadows? Should we allow the landscape character, including its cultural and historical entities, to gradually disappear from Krkonoše?

The same discussion recently unfolded over the targeted liquidation of various weeds and invasive plants, such as Monk's Rhubarb, which was brought here long ago with settlers from the Alps. Along with many other synanthropic species, it had begun to crowd out valuable meadow communities at the mountain enclaves, so the KRNAP Administration began a targeted liquidation programme, even in the strictly protected First and Second Zones of the national park, and even using chemicals. Many years ago, I had to very patiently explain to young conservationists from different parts of Europe, why the participants in the International Conservation Youth Camp were involved in the destruction of such plants in the national park. After all, the International Union for Conservation of Nature (IUCN) criteria do not permit such interventions in national parks. However, in most cases it was us humans who disrupted the natural course of evolution, so should we pretend to be innocent, and trust that the all-powerful nature can look after itself? Mostly it can, but the question is, at what price?

The long term vision of conservationists and the resulting care for the protected area must therefore be based on excellent knowledge of its long-term natural development, as well as of the human interventions which affected it, often in undesirable ways, in the past.

These are not easy decisions to make, because you are moving between dozens of legal standards, technical expertise, public pressure, conservation ethics and last but not least, the economic reality. All of this had to be expressed in the 'Management Plan for Krkonoše National Park and its Buffer Zone', on which the long-term management of the territory of the national park is based.

Visions of the natural (?) development of mountain nature in the context of long-term climate change are somewhat more complicated. If the spatial and species distribution of the Krkonoše nature begins to change, as indicated by a large number of detailed observations, what role should man himself play when confronted with the course of natural processes, such

as the natural spread of forests at the expense of treeless arctic-alpine tundra in the Krkonoše Mountains? Will it be useful to confront such natural processes in the national park to some degree, and will we be able to do it? In particular, when we are aware that the acceleration of such long-term changes and fluctuations was caused by human society on a global scale. But let's return to the mountains and to the contemporary role of man in the middle of the mountain nature.

Returning to the humility, wisdom and skills of our ancestors

Despite a certain amount of scepticism, which may ensue from the previous paragraph, it is necessary that the diverse community of people who use the wealth and diversity of our highest mountains make some wise choices now. This applies to both the locals and the six million visitors who come here every year. I have already mentioned the long-term 'Management Plan for Krkonoše National Park and its Buffer Zone', which has been thoroughly discussed and finally approved by the KRNAP Council as a binding document for the further development of Krkonoše. At the same time, the KRNAP Council launched constructive discussions with representatives of the Association of Municipalities in Krkonoše on the strategic direction of future development of Krkonoše.

The patient negotiations of the nine-member working group, composed of mayors of municipalities in Krkonoše and ecological experts, resulted in the formulation of a joint project called 'Vision 2050 Krkonoše', and using the motto 'Friendship between Man and Mountains' a document called the 'Declaration on the Future of Krkonoše' was created. This calls on all Krkonoše natives and residents, municipalities, Krkonoše businesses and their associations, non-profit organisations, schools, institutions and other entities, which have a relationship to the people and nature of Krkonoše, to express their support for this common vision and apply its principles to the everyday lives of people in the Krkonoše Mountains. The project suggests ways how to protect and rationally utilise the natural and cultural assets that Krkonoše provides us with, how to build on the experience and wisdom of our ancestors, how to think about the ethics of their stay in

the mountains and behave accordingly. We must reconcile many of our desires and deeds, with the fact that Krkonoše is a national park, the 'genius loci' of which has different forms and dimensions than in the Alps or other high mountain ranges in Europe.

With regard to our relationship to Krkonoše, much has improved recently. The mountain trails and footpaths are repaired using the proven method of 'stone pitching', which our ancestors used so well. Reconstruction and repairs to mountain chalets are now carried out with much greater respect for their historical character and the natural conditions in Krkonoše. Visitors and local residents are once again enjoying the renovated historical or religious monuments in a number of places. Farmers markets, historical fairs, and various attractive events are reviving the almost forgotten traditions of local crafts and skills of our ancestors, hundreds of acres of mountain meadows again enjoy regular care,



Monk's Rhubarb is the first of the invasive plants, against which we have started a great battle in Krkonoše. The docks are capable of rapidly replacing the varied colours of the meadows with their boring rusty hue. Archive photo from the Klínové Boudy Chalets before the radical interventions by the KRNAP Administration. Only individual plants, which must be systematically removed and killed every year, remained after this intervention was repeated (photo Kamila Antošová)

including the gradual return of livestock, which not only contributes to restoring the species diversity of mountain meadows, but also the atmosphere of the Krkonoše hillsides. The foresters in Krkonoše have successfully launched a long-term system of care, which supports natural regeneration processes in the mountain forests. The winter usage of the Krkonoše Mountains has its own rules and limits, particularly in the case of the development of downhill skiing, which was the subject of a detailed assessment of the possibilities and ecological limits of the landscapes in Krkonoše National Park and its Buffer Zone. The KRNAP Administration is trying ways how to permit more summer and winter outdoor activities on the territory of the national

park, without increased risk to the nature, and to reduce the conflicts which frequently arise between their fans and conservationists in the Krkonoše Mountains. The positive reactions to these and many other changes, that have successfully taken place in the Krkonoše National Park, are a great encouragement to all who are involved in preserving the unique environment of the Krkonoše Mountains.

Regardless of the deep scars that man has inflicted on the Krkonoše landscape in the distant and recent past, a proactive approach and adopting the moral code and motto of 'Friendship between Man and Mountains', is the best that one could wish Krkonoše National Park for its fiftieth birthday.



Malá Úpa – Žacléřské Boudy Chalets. The preserved landscape reminds us of the times when people had to live in harmony with nature (photo Kamila Antošová)

