

# Cumulative Effects of Development on Meadows in the Krkonoše Mountains

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**An old Czech proverb says that "One hundred times nothing has killed a donkey". In other words, many small burdens add up to a big crushing burden. This aptly depicts the essence of the problem we are facing each and every day within various fields of our activities. In the following article the authors explain the ways how they undertake to tackle the issue of cumulative effects of development on traditionally managed meadows of the Krkonoše National Park. At the same time, they seek to stimulate the indispensable thorough debate among the respective professional public.**

Meadows, the European Bullhead or the Corn Crake are misfortunate to be living outside the central zones of the Krkonoše National Park (KRNAP) while an individual investment plan rarely represents an impact that would prevent its implementation. As the total number of such threatening investments is really high, the long-term prospects for the mentioned subjects of conservation are not hopeful. Moreover, a multitude of fauna and flora species are facing a similar situation not only in the Krkonoše Mountains.



Velká Pláň in Pec pod Sněžkou. One of the most preserved sites of species-rich *Nardus* grasslands in the Krkonoše is seen by investors as a "greenfield" adjacent to the resort, thus being highly attractive for any development activities. Photo by: Stanislav Březina

One does not require any expertise to recognize that the Krkonoše meadows deserve our attention. The mosaic of forests and meadows forms a distinctive character of the Krkonoše landscape, which is so closely tied to the meadow enclaves of Zadní Rennerovky, Brádlery Boudy or Dvoračky as, for example, the Church of St. Nicholas to the panorama of Malá Strana in Prague. A well-managed meadow abounding with colours and shapes, flowers and butterflies, invites wanderers to slow down and contemplate and inspires scientists. Botanists may find here nearly a third of the flora native to the meadows of the Krkonoše, including endemic Bohemian Bellflower, while zoologists will have an opportunity to see over 160 species of beetles. Diverse combinations formed by the local flora do not cease to astonish the ecologists. Thanks to a pronounced diversity of elevations and a variety of management practices, a single meadow may equally be home to hardy plants of cirque walls, common meadow species of Podkrkonoší (foothills), or representatives of waterlogged meadows.



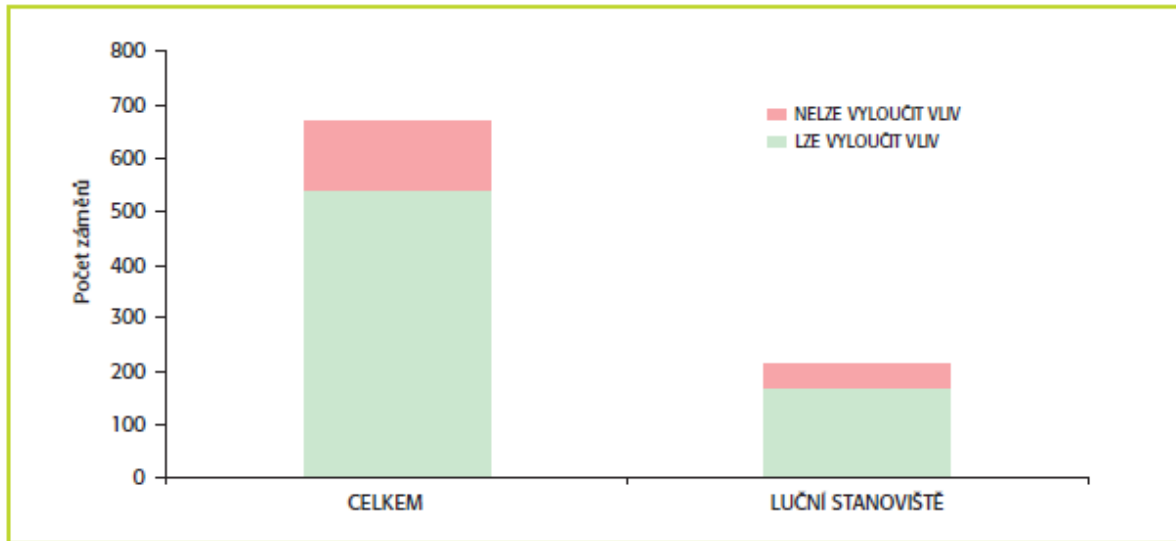
Bohemian Bellflower (*Campanula bohemica*) – endemic species inhabiting mountain meadows is one of the priority subjects of conservation in SCI Krkonoše.

### How to save unique meadows from development projects?

Unfortunately, the high value of the Krkonoše meadows itself does not provide a guarantee for their conservation. Observant visitors to the Krkonoše Mountains have certainly recognised the dramatic extent of current urban development in the local meadows. The overall statistical data of the Krkonoše National Park Administration explicitly prove that more than a third of recently implemented investments in the Krkonoše are located in meadows of a significant environmental and scientific value. Until recently, the Administration staff had very few instruments how to protect these unique habitats from being destroyed by development. Legislation relating to protected areas could not be applied as most of the meadows are located in the third zone of the national park or in its buffer zone (97.7% according to Natura 2000 mapping from 2000-2004), where development is permitted if environmental and landscape aspects are respected. The unprecedented pressure from the side of potential investors meant, however, that presence of specially protected species of fauna or flora (i.e. protected under national legislation) was decisive for the future existence of the meadows.

Integration of the Krkonoše in the Natura 2000 Network brought certain hope for substantial improvement in the situation. In 2005, the entire territory of the Krkonoše National Park including its buffer zone was designated as a Site of Community Importance (SCI). Nearly all of the traditionally managed meadows thus became subjects of conservation in the mentioned SCI, including all their fauna and flora species. Growing at the highest elevations, *species-rich Nardus grasslands on siliceous substrates in mountain areas* represent a priority habitat while *mountain hay meadows* and *lowland hay meadows* are regular subjects of conservation in SCIs. Within a procedure laid down by respective legislation, the administrations give their expert opinion on whether there is a *significant impact* of a development plan on SCI Krkonoše or not (hereinafter referred to as “Opinion under sec. 45i”). The final decision therefore does not only consider the presence of protected species but mainly the species diversity and quality of meadows as a whole. Should the given nature conservation body not exclude the mentioned *significant impact* on the SCI, the development project is subject to a detailed expert review by an authorised person (hereinafter referred to as “Assessment under sec. 45i”). The authorised person shall assess the extent of potential damage caused to the meadow and establish whether the development plan represents a *significantly negative impact* on SCI Krkonoše or not. If so, the implementation of the respective project is very likely not to be permitted. Nevertheless, following five years of existence of Natura 2000 in the Krkonoše National Park, the pace of development in its peripheries is still fast and the area of Natura 2000 meadows has already dropped by more than 1% (statistical data based on the Opinions under sec. 45i – see Chart 1).

**Chart No.1** Statistical data relating to Opinions issued by the KRNP Administration under sec. 45i in 2004-2010, and the corresponding decisions whether a *significant impact* of a submitted development project on SCI and SPA Krkonoše was excluded or not. First column shows all submitted development projects (n=669, *significant impact not excluded* in 19.1%), second column shows development projects implemented in the three mentioned meadow habitats (n=215, *significant impact not excluded* in 20.5%).



The mentioned decline is not definite though and the pace of development in most valuable and long-term managed meadows on the borders between residential areas and open landscape is not to slow down. Since the potential investments were first assessed individually case by case, the transformed area seemed negligible within the context of the entire SCI Krkonoše. Whether a log house, a pension or a hotel, these would take up maximum hundredths of percent of the total area of meadows in the Krkonoše. This itself does not commonly justify a decision declaring a *significantly negative impact* nor does it comply with the criteria for expert Opinion under sec.45i to state that a “*significant impact may not be excluded*”. Despite knowing that a meadow of any size would disappear one day if covered by a number of even miniature log houses, we still applied the mentioned procedure.

#### **Assessment of individual projects does not suffice**

It was becoming clearer every day that while assessing the impact of development projects on the Krkonoše meadows we would also have to take into account their overall, i.e. cumulative, effects. With regard to the intensive development in the area, the Krkonoše Mountains apparently became one of the areas in the country to be considered for first attempts to implement a new model approach to Natura 2000 assessment. At the time of its adoption in 2006, the official methodology of the Ministry of the Environment only briefly mentioned the necessity to consider the cumulative effects of development on the environment. However, insufficient experience did not allow for a detailed methodological guideline. It shall be noted that appropriate assessment of cumulative effects requires information relating to other structures in the surroundings of the project being assessed.

In cooperation with authorised persons, the staff of the Nature Conservation Department at the KRNP Administration began work on a new approach to cumulative effects. Their efforts gave rise to the Policy on Halting the Decline in Meadow Habitats in SCI Krkonoše (hereinafter referred to as “the Policy”. Simply put, the Policy establishes a maximum area of meadow habitats that may be “cut off” by overall development while still not causing any negative impact on the local meadows. The KRNP Administration may, in justified cases, *exclude any negative impacts* of individual small-scale projects on the subject of conservation in SCI Krkonoše until the moment when the established limit is reached. At the same time, it keeps a register of decline in meadows due to land take. Once the limit of maximum decline is exceeded (considering overall decline since the launch of the register, i.e. since the designation of KRNP as a Natura 2000 site), the Administration shall not *exclude a significant impact* of a development project on the respective subject of conservation. Authorised persons shall subsequently be obliged to take into consideration the size of the degraded area and shall duly justify any decision to be taken in favour of the investment.

Before presenting the limits it is essential to explain the substantial features of the proposed Policy. The limit of land take in the Krkonoše meadows is not supposed to be exceeded in a single day. The

local mesic meadows facing the most severe pressure from the side of investors were divided into six categories – i.e. three basic vegetation types under Natura 2000 classification, each of which is further split into two groups based on the level of representativeness and conservation of the vegetation cover. The maximum decline in the size of meadows is set for each category individually and potential land take is assessed accordingly.

### Spatial planning is decisive

The decline in the area of meadows is registered individually for each of the 29 cadastral areas of the Krkonoše municipalities. Each self-governing municipality shall have a chance to manage their transformed land on long-term basis independently of other municipalities. The concept seeks not to favour municipalities which reach the limit of land take sooner than the others. This would be the case if the decline in meadows was considered as a whole for the entire territory of the Krkonoše Mountains. It is indispensable for each self-governing municipality to establish their own spatial planning, which plays a decisive role in the mentioned “cut-off” in meadow habitats for development purposes and allows for most efficient land take planning. The most important task of the Policy is thus to set clear rules within spatial planning relating to land take in meadow habitats. With the view of preserving the mosaic of forests and meadows characteristic for the entire territory, the respective bodies shall also consider the overall decline in meadows from all municipalities. The meadows surrounding the central development areas will be saved from eradication. We should be aware of the fact that species diversity of any meadow significantly depends on its incorporation in the mosaic of similar habitats and on possible mutual exchange of flora diaspores or fauna species on a wider landscape scale.

### Policy Principles

As to the limits themselves, these are defined as percentage of the entire size of a meadow habitat of a given quality that may be destroyed (transformed by development) in the cadastre of each municipality until the Administration decides not to *exclude the significant impact* on SCI Krkonoše. The percentage is identical for each municipality but the total size as such differs with respect to the total area of habitats in the given cadastre.

The limit values reflect the type of the meadow habitat and the quality of the vegetation cover, ranging from 1% (maximum land take in priority species-rich *Nardus* grasslands showing good representativeness and level of preservation) to 9% (maximum land take of other meadow habitats of a lower representative value and level of preservation). The Policy lays down an exception for two endemic subtypes of assessed meadow habitats (total size of several tens of hectares) – *species-rich subalpine Nardus grasslands* and *Silene montane meadows* (these are considered untouchable). Investment shall thus be naturally directed to areas that are home to lower quality meadows that are not priority subjects of conservation (see Chart 2).

**Chart No.2** Limits of maximum land take in meadow habitats – subject of conservation in SCI Krkonoše - expressed in percent. Habitats (“Stanoviště”): 6230 *Species-rich Nardus grasslands, on siliceous substrates in mountain areas*, 6510 *Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)*, and 6520 *Mountain hay meadows*. Quality I is combinations of the level of preservation and representativeness A/A, A/B, B/A, B/B, and A/C, based on the outcomes of Natura 2000 habitat mapping. Quality II is all other combinations. The limits are stated separately for land take in meadow habitats of quality I and as a sum for land take in habitats of quality I and II (the limit for habitats of quality I is only potential and may not be necessarily reached if the overall limit for category I+II is exceeded before). **Note:** The limits of 9% for categories 6510 and 6520 of quality II mentioned above in the article are not stated in the chart. These were used as initial values to calculate the 6% limits for an overall land take in habitats of quality I and II, i.e., on average, from 3% for habitats of quality I and from 9% for habitats of quality II. The size of habitats of quality I generally equals the size of habitats of quality II.

Stanoviště	6230		6510		6520	
Kvalita	I	I + II	I	I + II	I	I + II
limit (%)	1	2	3	6	3	6

It shall be noted that the limits of several percent has not been set by coincidence but based on a logical transformation from the official methodology of the Ministry of the Environment, which is further backed by experience abroad (e.g. Germany). The methodology of the Ministry of the Environment

regards order of several percent as limiting when deciding on a *significant negative impact* of individual development projects. The Policy thus covers the entire percent range given by the ministerial methodology and sets the limits correspondingly respecting the natural and scientific values of a given vegetation cover. The actual differentiation of limits of land take, defined under the methodology of the Ministry of the Environment and applied within the Policy, is highly responsive to potential investors. A comparable methodology applied abroad (guideline to Natura 2000 assessment in Germany) suggests 1% of the relative area as a limiting value in the decline of meadow habitats. The proposed Policy features several substantial prerequisites for success – it is simple and transparent, and it is based on a detailed register of development plans and mainly on a long-time consensus among its users (authorised persons). It also brings first valuable results. It has been used to assess all proposals for spatial planning in the territory of SCI Krkonoše (e.g. Benecko, Jestřabí v Krkonoších, Horní Maršov, etc.) and has helped regulate development on tens of hectares of the Krkonoše meadows.

Nevertheless, we do not consider the text of the Policy as ultimate. On the contrary, we understand it as a crystallisation nucleus attracting critical response by the professional public, which shall give rise to other more sophisticated projects. This is the only way how to draw up professionally justified methodologies capable of withstanding the presupposed criticism by investors. Our Policy has already been “baptised by fire“ although the critical and decisive phase is still ahead – the land take register relating to meadow habitats shows that certain municipalities are already approximating their limits...

#### Notes

<sup>1</sup> Methodology for determination of significance of impact under sec. 45i of Act No. 114/1992 Coll., on the Conservation of Nature and Landscape, as amended (Bulletin of the Ministry of the Environment, Volume XVII, No. 11)

<sup>2</sup> Lambrecht H., Trautner J. (2007): Fachinformationssystem und Fachkonventionen zur Bestimmung der Erheblichkeit im Rahmen der FFV-VP – Endbericht zum Teil Fachkonventionen. FuE Vorhaben im Rahmen des Umweltforschungsplanes des Bundesministeriums für Umwelt, Naturschutz and Reaktorsicherheit im Auftrag des Bundesamtes für Naturschutz (FKZ 804 82 004), Hannover und Filderstadt: 1-239.

## SUMMARY

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Bauer P.: Cumulative effects of development on meadows in the Krkonoše Mountains

Cumulative effects of development activities (particularly resort and residential development) on traditionally managed meadows pose a serious problem in the Natura 2000 SCI Krkonoše. The loss of the meadows caused by individual house-building projects is often too small to justify their prohibition despite they directly influence or destroy even the priority target features within the SCI. However, the large number of such projects along with their cumulative effects considerably reduce the total area of the local meadows. This article presents the Policy on Halting the Decline in Meadow Habitats in SCI Krkonoše – an approach used by the Krkonoše National Park Administration and persons authorised to conduct due assessment. The main aim of the Policy is to identify a priori the extent of mountain meadow loss in the SCI caused by a *significant impact* of a project, identified within the Assessment, pursuant to Act No. 114/1992, Coll. on the Conservation of Nature and Landscape, Section 45, letters h) and i). The Policy's principles are described as well as the first experience within the spatial planning process. The Policy is presented for a broad discussion and possible implementation in other SCIs in the Czech Republic.