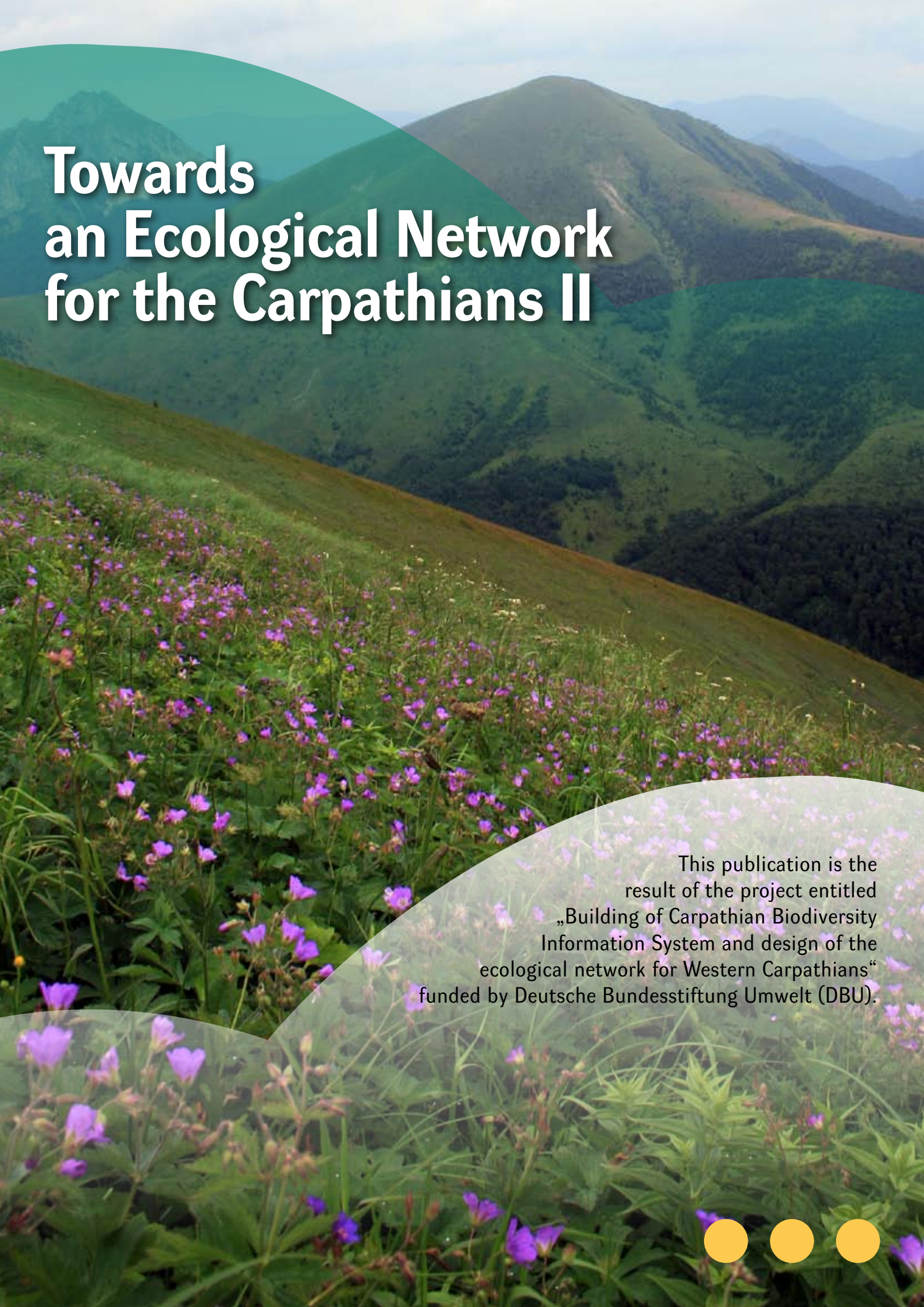
Towards an Ecological Network for the Carpathians II



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1. Preface

The Western Carpathians are an outstanding area within the Carpathian arch, which is along with the Alpine one, the most projecting mountain system in Europe. They represent one of the most significant natural refuges of the continent with rich biodiversity, considerable range of forests, meadows, diverse scale of wetlands and a number or further interesting biotopes. WWF included the Carpathians within "Global 200" worldwide list of ecoregions noted for exceptional levels of biodiversity. Twenty three Western Carpathian biotopes, thirteen animal and twelve plant species are priority in terms of European Community legislation. A great contribution for understanding the overall situation in the Carpathians is provided by "The Status of the Carpathians" (Webster et al. 2001), which was prepared by WWF in 2001 as a result of two year intensive work. Local experts of all the Carpathian countries evaluated the knowledge on biodiversity and significant social and economic factors which influence its status. This initial stage was followed up by the BBI-Matra project, the aim of which was to contribute to the design the Carpathian Ecological Network in Romania, Ukraine and Serbia. This project significantly contributed to the safeguarding of a coherent action in building an ecological network in the Carpathians (Zingstra et al. 2009).

The aim of international treaties and conventions (e.g. the Convention on Biological Diversity, Ramsar Convention, the Carpathian Convention, Alpine Convention, etc.) is to make the process of protection and sustainable use of bio- and landscape – diversity more effective. An effective protection or conservation stems from sufficient knowledge and understanding of current status of biodiversity, the processes, which shape it as well as the manners how the biological diversity is used.

The area of the Western Carpathians stretches through the territories of the Czech Republic, Slovakia, Poland and Hungary, which predestines common action and policy to solve the problems. The CERI's attitude towards the protection of this area is based on cooperation and participation, large scale action range and common vision. This approach is in full accordance with the concept of ecological networks, the aim of which is to provide a planning framework for sustainable development and biodiversity protection within the core areas, containing important ecosystems, habitats, landscapes and/or species populations through their mutual interconnection by corridors, but also beyond them as well.

The idea of ecological network sensu lato emerged in different parts of Europe long time ago (e.g. Lithuania and Estonia in the 70's, the former Czechoslovakia was one of the first countries where the idea of ecological network was integrated into the conservation policy). It was not until 1995 (3rd Ministerial conference in Sofia) when up to 54 European countries endorsed the action to establish the Pan-European Ecological Network as a part of the Pan-European Biological and Landscape Diversity Strategy. A part of the task set was to establish this ecological network within 20 years. In the Carpathian scope the task is underlined in the Article 4.5 of the Carpathian Convention stating, that the parties shall cooperate in developing an ecological network in the Carpathians, as a constituent part of the Pan-European Ecological Network.

CERI's goal is to lead the design and development of a robust ecological framework for a Living Carpathians and supported and inspired its implementation in all seven Carpathian Countries. Building bricks how to achieve this goal are the activities leading to the design of the regional – Carpathian ecological network. In the period of 2006 - 2009 CERI implemented the project "Development of a Carpathian Ecological Network" of Wageningen International, supported by BBI-Matra. By means of CERI's member organisations and cooperating organisations (Orbicon, Daphne, Alterra, ECNC, Interim Secretariat of Carpathian Convention, WWF-DCP) biodiversity and socio-economic data collection was realized on the territories of the three South-Eastern Carpathian countries – Ukraine, Romania and Serbia so as to build up joint Carpathian Biodiversity Information System (CBIS) as a basic precondition to work out a concept for a Carpathian Ecological Network.

It was, however, desirable to start complementary process of the design of an ecological network in the remaining Carpathian countries – in Slovakia, Poland, Hungary and the Czech Republic. This important step was supported by DBU (Deutsche Bundesstifftung Umwelt) as a project Building of Carpathian Biodiversity Information System and design of the ecological network for the Western Carpathians ("Aufbau des Carpathian Biodiversity Information System und Vorschläge für einen grenzüberschreitended Biotopverbund in den Westkarpaten") realized by core team of IBN – Institut für Biodiversität, CERI, Daphne SR – Institute of Applied Ecology, Daphne CZ – Institute of Applied Ecology, Institute of Botany – Slovak Academy of Sciences, E-misszió Environmental Association and Institute of Nature Conservation – Polish Academy of Sciences. The results of this fruitful cooperation are presented in this report.

2. Carpathian Biodiversity Information System

2.1 Introduction

Carpathian Biodiversity Information System (CBIS) is a tool gathering published or recorded but non-published data on the occurrence of the selected elements of the Carpathian biodiversity, namely the plant and animal species and habitats. It is being built by country experts with practical experience with these natural elements in the field, benefiting also from the existing national and international databases. The CBIS is managed by Daphne – Institute of Applied Ecology on behalf of CERI.

The process of building the CBIS initiated in 1999, in the course of preparation of the report "The Status of the Carpathians". It was assumed that careful planning in the region needs to be based on a full outline of its unique wealth of biodiversity. Thus Focal Species (4 species of large carnivores, 8 other mammal species, 22 bird species, 7 species of reptiles and amphibians and 20 species of invertebrates) as well as Focal Habitats were selected. Information on their occurrences in the Carpathians was collected on the level of orographical units, as working spatial units, which created the basis of the CBIS. This data enabled to characterize the biodiversity value of these units. Next, incorporating a set of socio-economic data into the system, the "Priority Areas for Nature Conservation", encompassing the most important natural Carpathian large-scale areas with the most urgent need of protection were identified through GIS technology. They constituted 15% of all the area of the Carpathians (33 462 km^2). These areas covered 43% of the declared protected areas (26 178 km^2).

Activities realized under the project "Development of an Ecological Network for the Carpathians", which was implemented from April 2006 to April 2009 and funded by BBI-Matra, meant a significant step forward in the building of CBIS. The base of data was substantially enriched and comprised the facts on the occurrence of 148 habitats, 201 plants, 133 animals and 31 freshwater features. Their occurrences were recorded again in orograhical units, the delineation of which, however, undergone substantial refinement in GIS environment. For Annex I and II priority habitats and species of the EU Habitats Directive, precise information on the location was collected. Besides this, the affinity to CORINE Land Cover units and altitudinal range of distributions (based on the affinity of habitats and species to altitude) were gathered. As a result of this process, the CBIS acquired the information on distribution of 513 species and habitats in more than 13 thousand sites. This system was made available for anyone interested through http://www.carpates.org/cbis.html. Selection of species and habitats followed the requirement that they should help to define the areas that must be included in the ecological network, being the central building blocks. There must be sufficient knowledge of them, including their distribution and status, to allow them to be mapped and understood. By the end of the project, the CBIS developed into a unique database presenting information on the treasury of biodiversity across the Carpathians. One of the advantages is also that it presents a compatible habitat descriptions and interpretation across the country borders. However, there are still its limitations, which are intended to be eliminated with future work. This database, along with a robust pool of data on socio-economic aspects of the territory, enabled to design the proposed ecological network for the Carpathians in Ukraine, Romania and Serbia.

One of the crucial tasks of the current project was to collect and feed the CBIS with compatible information from the territory of the Western Carpathian countries – Czech Republic, Poland, Slovakia and Hungary. The work was coordinated by Carpathian Ecoregion Initiative. The data gathering was performed by the CERI members, in each country represented by contracted experts. Each expert team included a GIS expert, zoologist, botanist and an expert on vegetation. The purpose of the data gathering was further analysis to design a proposal for ecological network, as a planning instrument for sustainable development in the Western Carpathians. The Carpathian Biodiversity Information System is available through the CERI website http://www.carpates.org/cbis.html. The System is flexible and living, intended to be regularly updated.

2.2 Organisation of data collection

The organisation of the data collection was compatible with the one from the project carried out in the South-Eastern part of the Carpathians, with some improvements, considering the lessons learnt. The first step of the data gathering process was assessment of availability and reliability of data on biological and geographical aspects in the four countries, including availability and reliability of maps and databases storing biodiversity data. This was done through standard work-sheets prepared for country experts. The experts collected far up to 250 references on vegetation, plants, animals, water, abiota, maps and geodata and existing databases. These references were incorporated into the databases on the occurrences of species and alliances by CERI GIS expert. The databases were later distributed back to the country experts and they were filling in the data on distribution of the species and alliances.

Next a pair of parallel running activities followed, namely refinement of the borders of the orographical units (basic spatial working units) and preparation of reference lists of plant and animal species and habitats per country. The division of the Carpathian area into orographical units was used also in the South-Eastern part of the Carpathians. The package of source documents was prepared for country GIS experts to perform the work – existing boundaries of orographical units in "Pulkovo_1942_GK_Zone_4" and "GCS_WGS_1984" projection systems. Further resources which were needed for the work were general geographical map or other GIS resource in scale 1:200 000 (e.g. Digital Elevation Model with 90 m per pixel). The country GIS experts checked and refined the borders and also the names of the orographical units. They delivered it to the CERI GIS expert for further processing into the database. The project area covers 148 orographical unit on the total area of 72 978 km^2 (Fig. 1).

The working checklists for habitat types, plants and animal species were assembled and spread to country experts, who revised them. The revised checklists include (cf. Annex):

- 169 endemic and Habitat Directive II plant species (240 species were revised)
- 137 semi-natural and natural habitats, represented by alliances, including Habitat Directive Annex I habitat types (147 alliances were revised)
- 248 focal species (important for biodiversity of the Carpathians) and Habitat Directive Annex II animal species (256 species were revised)

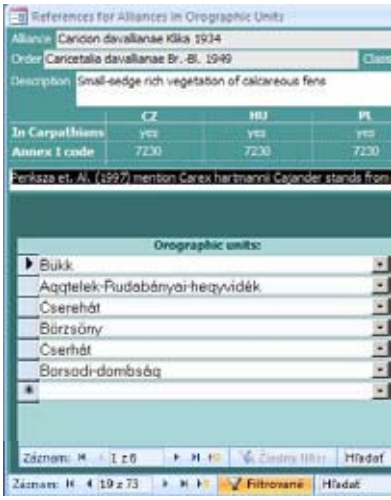
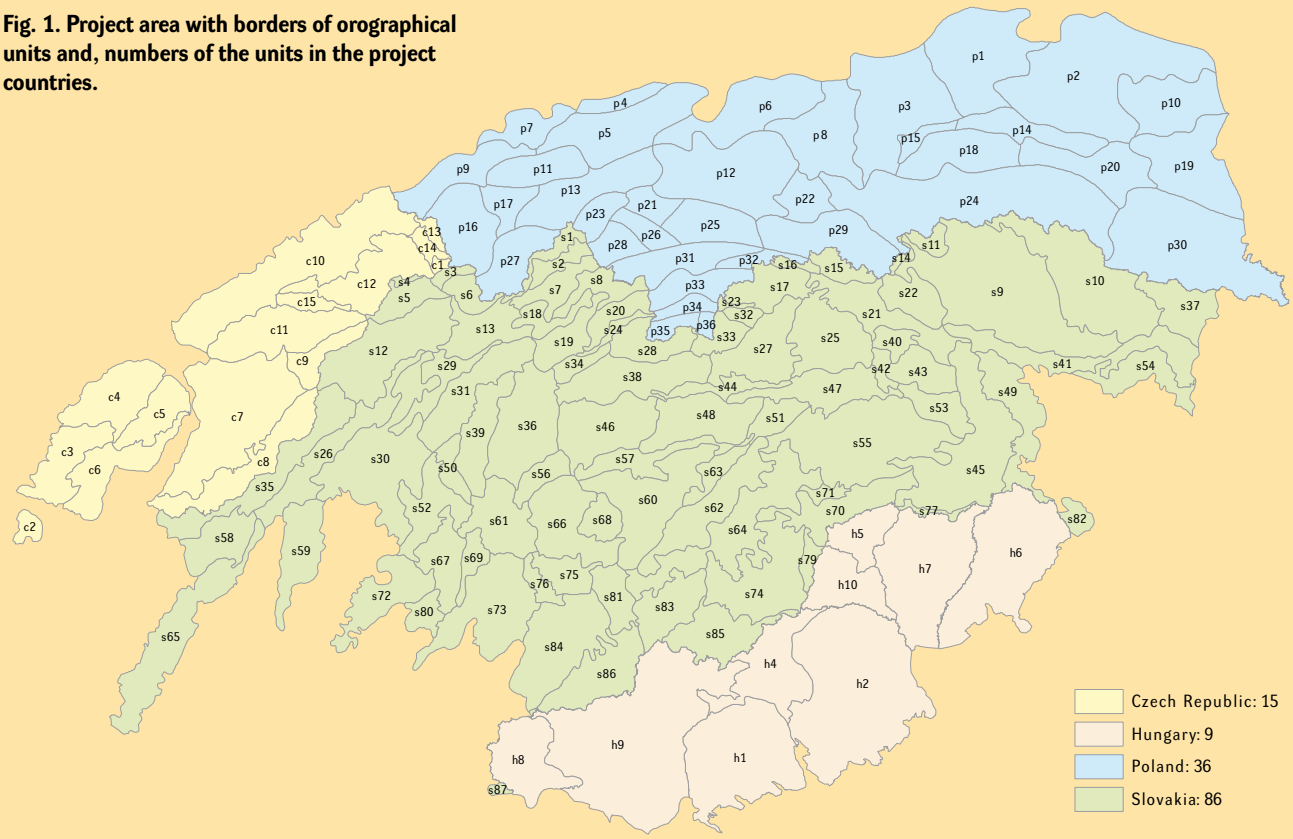


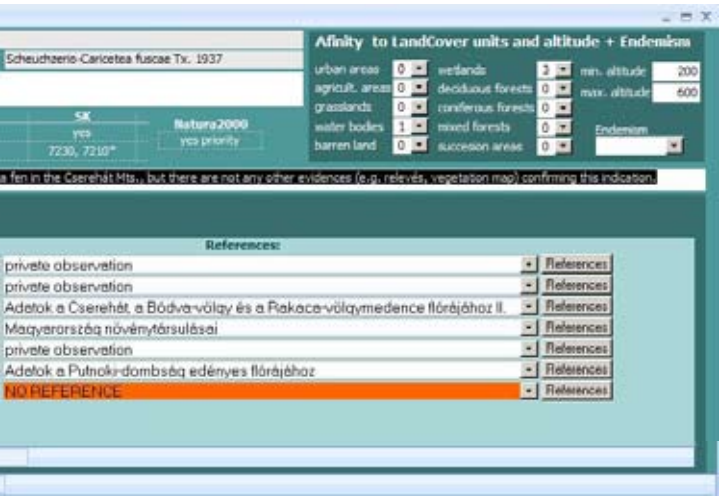
Fig. 2. User data form of the alliance database.

Fig. 1. Project area with borders of orographical units and, numbers of the units in the project countries.



2.3 Information system development

For enhancement of the existing CBIS with the data from the Western Carpathian countries, four national databases were tailored and distributed to the country teams through CERI website. Into the database, the information on the occurrences of the species and habitats per orographical units were entered, as well as the affinity of the species or habitat to the main CORINE Land cover types and to altitudinal range. This enables to produce distributional maps for the species and habitats. For priority species and alliances, moreover, the precise spatial data (geographical coordinates) were collected. Alliance (in few cases level of sub-alliance was used), an ecological unit within the classification of the vegetation through the Braun-Blanquet approach for vegetation research, is the vegetation unit, which was used for interpretation of the habitats of European conservation interest within the Natura 2000 network. For clear understanding of the alliance concept, a short description was added to each of the alliance. Description of alliances was mainly following publication of Rodwell at al. (2002), but in several cases national vegetation literature was used. Vegetation classification system differ slightly between countries and it was important to agree on the same ecological understanding and definition of alliances.



For each species and alliance an information on relevance to NATURA 2000 was filled in (Fig. 2). Our focus was only on natural and semi-natural alliances. Ruderal alliances which are stronly influenced by human activities were excuded and data on occurrences were not collected. Plant species diversity is highlighted by endemic and Natura 2000 plant species. Problematic species, varietas and apomictic species (as *Rubus*, *Alchemilla*, *Taraxacum*) were excluded. Data on type of endemism were collected also. Our focus was on Carpathian endemic and subendemic species. Among them are endemics with a wide distribution in the whole Carpathians, Western or Eastern and Southern Carpathians, and also stenochoric endemics limited to particular Carpathian ranges. Endemic species of other phytogeographical units (for example Pannonian), even occuring in the Carpathian orographical units were excluded. Definition of type of endemism was mainly following publication of Kliment (1992), but in many cases national references were used.

Czech Republic
c1 Jablunkovské mezihoří
c2 Mikulovská vrchovina
c3 Ždánický les
c4 Litenčická pahorkatina
c5 Chřiby
c6 Kyjovská pahorkatina
c7 Vizovická vrchovina
c8 Bílé Karpaty
c9 Javorníky
c10 Podbeskydská pahorkatina
c11 Hostýnsko-vsetínská hornatina
c12 Moravskoslezské Beskydy
c13 Slezke beskydy
c14 Jablunkovská brázda
c15 Rožnovská brázda

Hungary
h1 Mátra
h2 Bükk
h4 Hevesi-dombvidék
h5 Aggtelek-Rudabányai--hegyvidék
h6 Tokaj-Zempléni--hegyvidék
h7 Cserehát
h8 Börzsöny
h9 Cserhát
h10 Borsodi-dombság

Poland
p1 Pogórze Strzyżowskie
p2 Pogórze Dynowskie
p3 Pogórze Ciężkowickie
p4 Rów Skawiński
p5 Pogórze Wielickie
p6 Pogórze Wiśnickie
p7 Podgórze Wilamowickie
p8 Pogórze Rożnowskie
p9 Pogórze Śląskie
p10 Pogórze Przemyskie
p11 Beskid Mały
p12 Beskid Wyspowy
p13 Beskid Makowski
p14 Kotlina Jasielsko--Krośnieńska
p15 Obniżenie Gorlickie
p16 Beskid Śląski
p17 Kotlina Żywiecka
p18 Pogórze Jasielskie
p19 Góry Sanocko--Turczańskie
p20 Pogórze Bukowskie
p21 Kotlina Rabczańska
p22 Kotlina Sądecka
p23 Pasmo Babiogórskie
p24 Beskid Niski
p25 Gorce
p26 Beskid Orawsko--Podhalański
p27 Beskid Żywiecki
p28 Działy Orawskie
p29 Beskid Sądecki
p30 Bieszczady Zachodnie
p31 Kotlina Orawsko--Nowotarska
p32 Pieniny
p33 Pogórze Spisko-Gubałowskie
p34 Rów Podtatrzański
p35 Tatry Zachodnie
p36 Tatry Wschodnie

Slovakia
s1 Oravské Beskydy
s2 Podbeskydská brázda
s3 Jablunkovské medzihorie
s4 Moravsko-sliezske Beskydy
s5 Turzovská vrchovina
s6 Kysucké Beskydy
s7 Podbeskydská vrchovina
s8 Oravská kotlina
s9 Ondavská vrchovina
s10 Laborecka vrchovina
s11 Busov
s12 Javorníky
s13 Kysucká vrchovina
s14 Ľubovnianska vrchovina (východ)
s15 Ľubovnianska vrchovina (západ)
s16 Pieniny
s17 Spišská Magura
s18 Oravská Magura
s19 Oravská vrchovina
s20 Skorušínské vrchy
s21 Spišsko-šarišské medzihorie
s22 Čergov
s23 Podtatranská brázda (východ)
s24 Podtatranská brázda (západ)
s25 Levočské vrchy
s26 Považské podolie
s27 Popradská kotlina
s28 Zapadné Tatry
s29 Žilinská kotlina
s30 Strážovské vrchy
s31 Malá Fatra
s32 Belianské Tatry
s33 Vysoké Tatry
s34 Chočské vrchy
s35 Biele Karpaty
s36 Veľká Fatra
s37 Bukovské vrchy
s38 Liptovská kotlina
s39 Turčianska kotlina
s40 Bachureň
s41 Beskydské predhorie
s42 Branisko
s43 Šarišská vrchovina
s44 Kozie chrbty
s45 Košická kotlina
s46 Ďumbierske Tatry
s47 Hornádska kotlina
s48 Kráľovohoľské Tatry
s49 Slánske vrchy
s50 Žiar
s51 Slovenský raj
s52 Hornonitrianska kotlina
s53 Čierna hora
s54 Vihorlatské vrchy
s55 Volovské vrchy
s56 Starohorské vrchy
s57 Horehronské podolie
s58 Myjavská pahorkatina
s59 Považský Inovec
s60 Veporské vrchy
s61 Kremnicke vrchy
s62 Stolické vrchy
s63 Muránska planina
s64 Revúcka vrchovina
s65 Malé Karpaty
s66 Zvolenská kotlina
s67 Vtáčnik
s68 Poľana
s69 Žiarska kotlina
s70 Slovenský kras
s71 Rožňavská kotlina
s72 Tríbeč
s73 Štiavnické vrchy
s74 Rimavská kotlina
s75 Javorie
s76 Pliešovská kotlina
s77 Bodvianska pahorkatina (východ)
s79 Bodvianska pahorkatina (západ)
s80 Pohronský Inovec
s81 Ostrôžky
s82 Zemplínske vrchy
s83 Lučenská kotlina
s84 Krupinská planina
s85 Cerová vrchovina
s86 Ipeľská kotlina
s87 Burda

2.4 Contents of the CBIS

Habitats

- Number of alliances: **137** (147 checked)
- Number of occurrences in orounits: **3127**
- Number of precise locations GIS layers: **34**

Plant species

- Number of plant species: **169** (240 checked)
- Number of occurrences in orounits: **1 690**
- Number of precise locations GIS layers: **7**

Animal species

- Number of animal species: **248** (256 checked)
- Number of occurrences in orounits: **5 443**
- Number of precise locations GIS layers: **10**

2.5 From CBIS to ecological network design – a method

The results of the planning system developed for South--Eastern Carpathians pointed at several pecularities of the Carpathian mountains. Main specificity is "too natural", or "too much biodiversity" character of this area, comparing to the other regions, where the method for design of ecological network was applied. Benefit of the applied approach was, that it provided objective/"more objective" selection of suitable core areas. This is, however, in the natural conditions of the Carpathians still a preliminary step, because additional information from zoologists, botanists and habitat experts was needed for more detailed selection of "spots" from the preselected "cloud". This was an incentive for the discussion to explore the possibilities for further work with data collected from the Western Carpathians searching for an alternative approach. A 3-criteria approach for a sufficient ecological network was considered:

1. it covers sufficient area of distribution of the species/habitat (sufficient means at least 20%, and 60% for important or priority species/habitats) – this equals the targets set for the system, which was used for South-Eastern Carpathians (Zingstra et al. 2009 with the references there in).
2. it covers top localities (in this case orographical units) of the species/habitat
3. it is coherent – meaning it evenly covers area of distribution

Taking into consideration these assumptions, the focus was targeted on the following items:

1. significance of the species/habitats:
   - Carpathian scope → endemics,
   - Natura 2000 scope → Annexes
2. occurrence of species/habitats in the country taking into account its total distribution:
   - (widely spread in the country and also in the surrounding country, edge of its distributional area – thus rare in the country, centre of distribution in the country, rare in the country and only there)
3. if there are only a few localities (e.g. 5) all of them are included

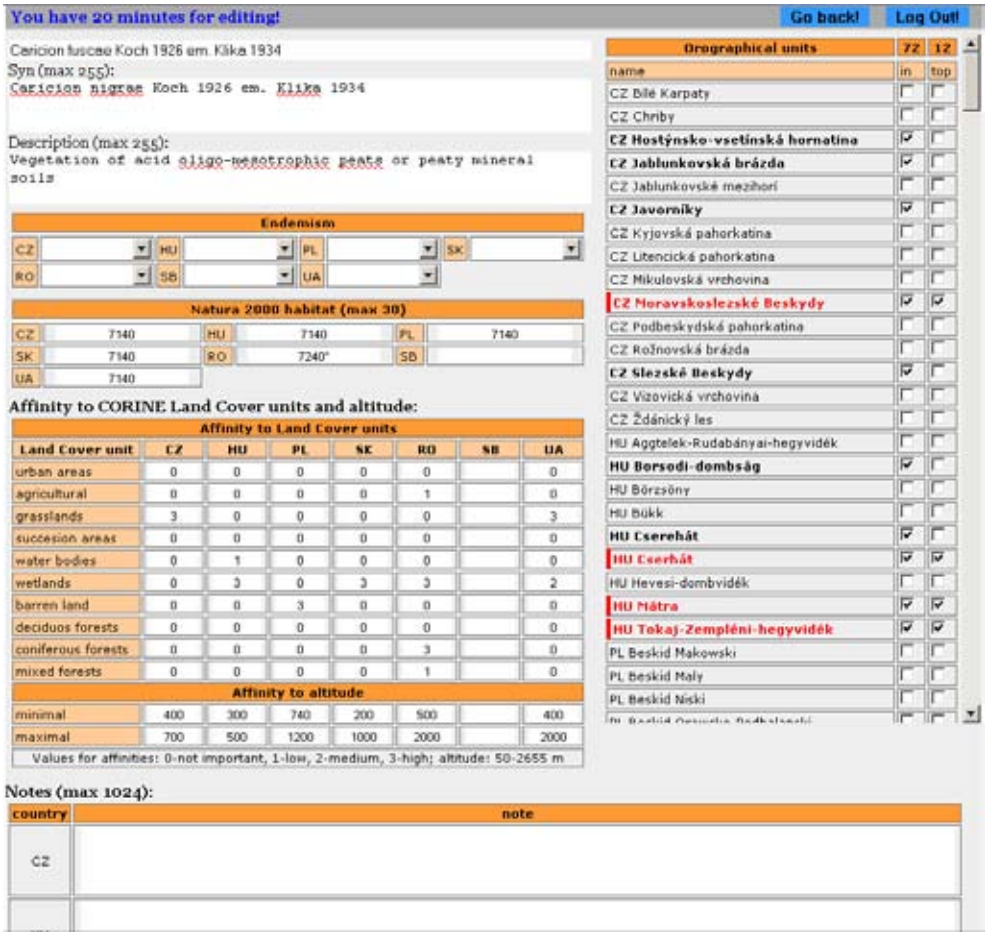


Fig. 3. Example of on-line system of CBIS for habitat types

Following these assumptions, country experts selected top orographical units for species/habitats (Top orographical units mean, that if these are not included, the "network" is not sufficient). To secure coherence of the "network", it was important to include orographical units throughout the whole distributional area. The information on top orographical units was given for selected species/habitats from the lists:

- plants – Annex II species and Carpathian endemic plants
- animals – Annex II species and birds
- habitats – Annex I habitats

For determination of the areas with the highest biodiversity further information was collected from the experts through an interactive on-line system, which was developed for this purpose (see Fig. 3).

The experts, based on their knowledge and experience, selected so called „top-orographical units" for the selected species and habitats. Draft maps were prepared, featuring the elements of endemism, NATURA 2000, habitats (with subgroups of alpine and subalpine habitat types, forest habitat types, open and semi-natural habitat types, grassland habitat types, wetland habitat types and NATURA 2000 habitat types) and all habitats and species. These were commented by experts from the region on a meeting and then finalized so as they depict the most accurate assessment of the situation.

2.6 Purpose, benefits and limitations of the CBIS

Carpathian Biodiversity Information System is:

- a unique database presenting information about the wealth of biological diversity for the whole of the Carpathians
- a solid basis for the creation of a list of Carpathian endemic plants, animals and habitats
- an indispensable tool for careful planning of various kinds of infrastructure, the development of tourism, mining activities and the development of agriculture
- the advantage of the CBIS is that it presents a compatible habitat description and interpretation across country borders

Besides the fact that the CBIS is the best available data source for the distribution of biodiversity data across the Carpathians, one should take into account that:

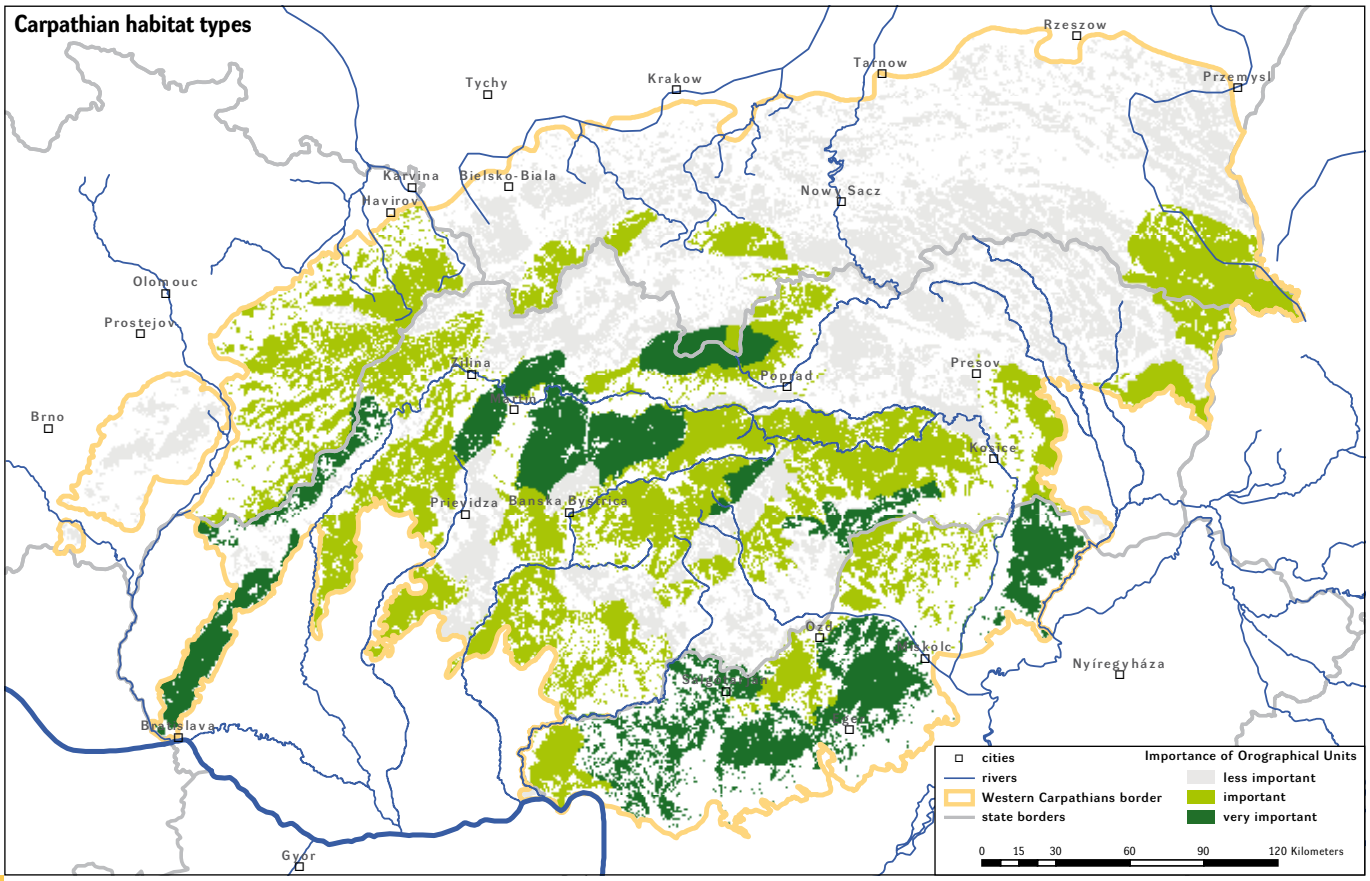
- only published data and involved experts opinions are used, data were not verified in the field
- the methodologies of gathering and assessing the data in the Carpathian countries differ slightly
- blank spots on the distribution maps (indicating no records of that conservation target) occur possibly due to a lack of research in that area, with the result that there may be no data available
- land cover and altitude affinities result in potential distributions
- affinities to land use and altitude are based partly on estimates
- as a result of previous points, potential distribution can be overestimated

3.

Results of the analyses and the proposed ecological network

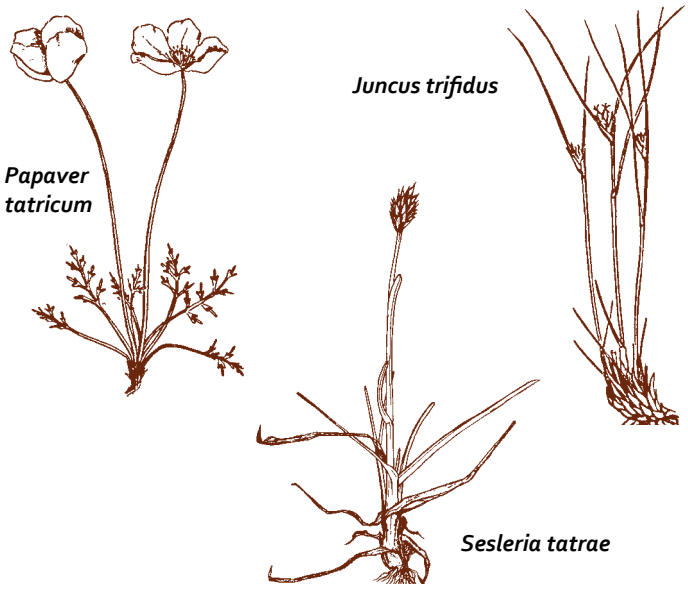
Suggestions from the project experts were collected and incorporated into the Carpathian Biodiversity Information System as well as to the process of elaboration of the project results – a set of synthetic maps being the first step to the identification of core areas and corridors of the ecological network. In the synthetic maps, the areas are assigned to the three categories: "not important", „very important" and „important". This is based on the number of conservation features (e.i. species/habitats) in the orographical units, using the scaling of the data set through natural breaking method.

The maps show that the area of Western Carpathians remains relatively rich in biodiversity. Thus, the design of an ecological network on one hand is easier than in other areas, as there is a greater number of areas to choose from, but on the other hand the concrete allocation of core areas and corridors will be more complicated. Crucial aspect is to find management solutions to existing habitats than the restoration or creation of artificial corridors. The design of the ecological network in the Carpathians is more about predicting the decline of natural habitats and species.



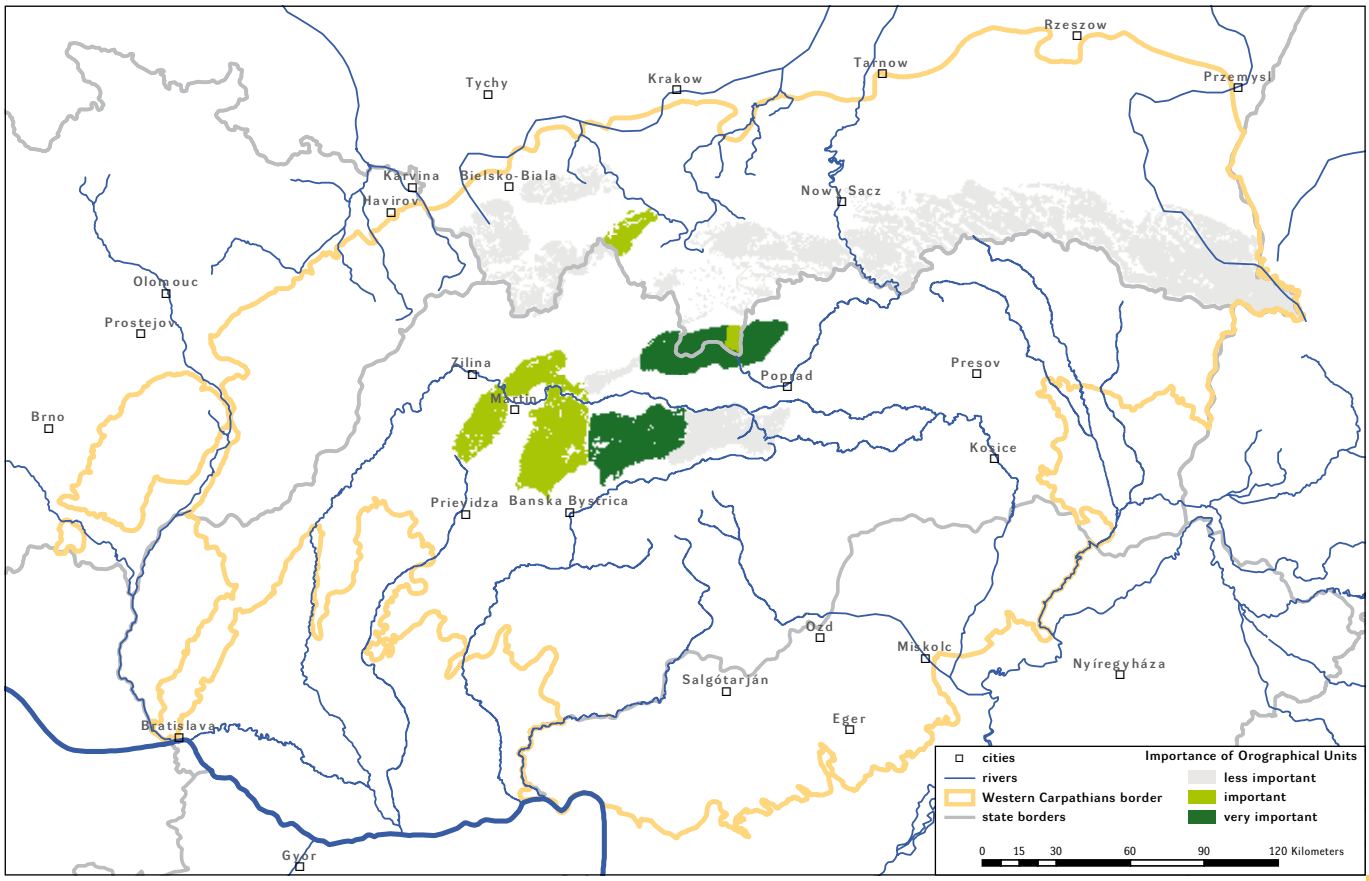
3.1 Carpathian habitat types

Database of Western Carpathians contains 137 habitats (alliances) in total (see Annex 5.1), which is a great habitat diversity. Very important and richest are following orographical units: Veľká Fatra Mts. (60 alliances), Západné Tatry, Malá Fatra and Ďumbierske Tatry (more than 50 alliances per unit). Those mountain ranges are rich in geological substrate, predominantly calcareous, which is reflected in species and habitat diversity. Malé Karpaty and Muránska planina (Slovakia), Bükk and Tokaj-Zempléni-hegyvidék (Hungary) contain between 45 to 49 habitats.



Alpine and subalpine habitat types

30 habitats are occurring in subalpine and alpine zone of Western Carpathians, some of them are partly endemic or endemic. The Tatry Mountains, constitute a mountain range which forms a natural border between Slovakia and Poland. This is the highest mountain range of the Carpathians. Although considerably smaller than the Alps, they are classified as having an alpine landscape. The Tatry Mountains together with Ďumbierske Tatry (part of the Nízke Tatry Mountains) are the most important in respect to occurrence of alpine and subalpine habitats. *Festucion carpaticae*, *Festucion versicoloris*, *Juncion trifidi* and *Seslerion tatrae* are endemic natural grassland communities occurring on alpine belts of central mountains of Western Carpathians. *Papaverion tatrici* is endemic alliance of alpine limestone-scree communities of Tatry Mountains.

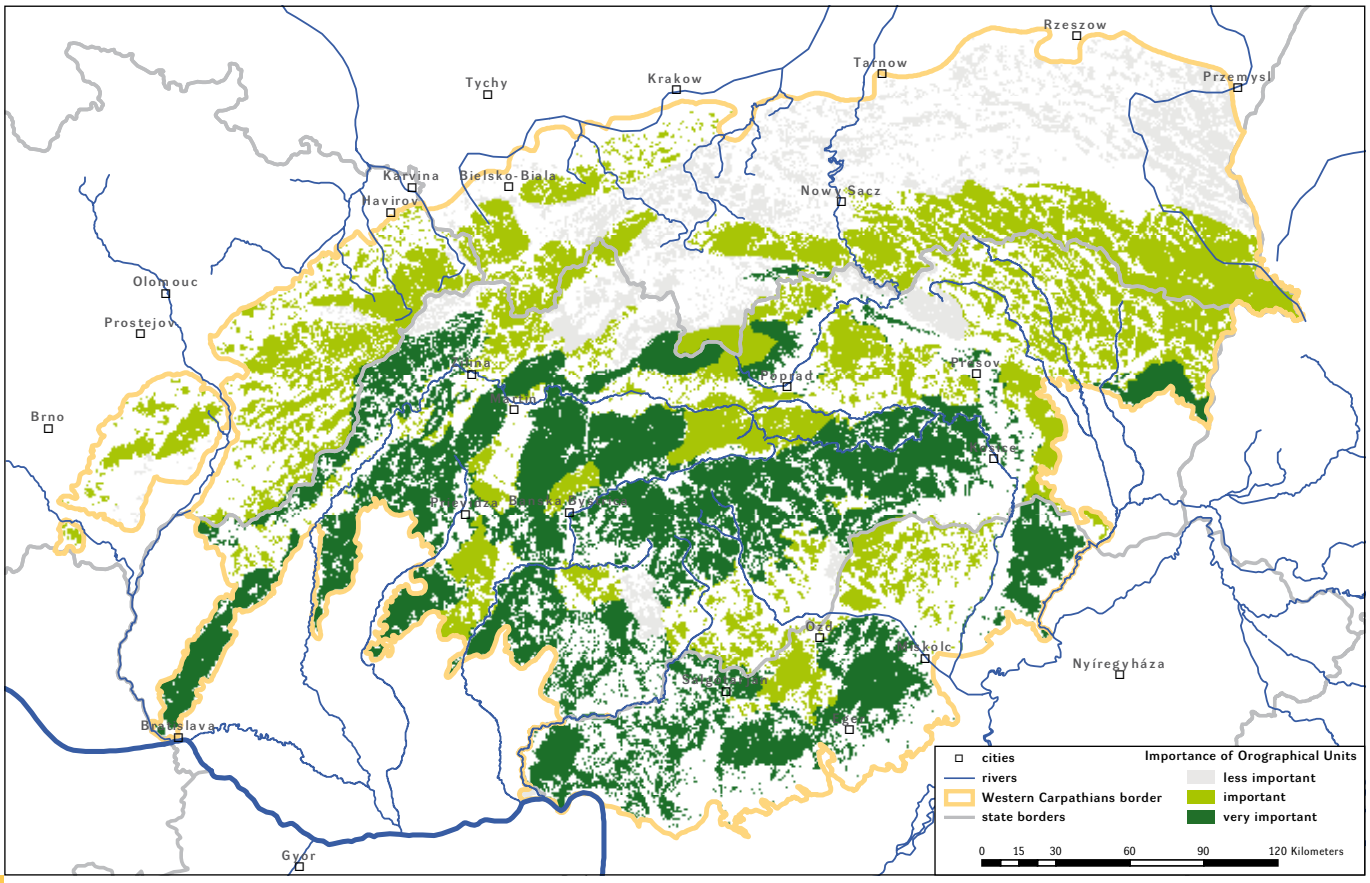


Forest habitat types

Natural forests are important feature of the Carpathians. 26 forest habitat types – from low mountain oak forests, through beech-oak mixtures to beech, beech-conifer mixtures to conifer woodland. The forests show an incredible natural diversity. Biggest diversity of habitat types was recorded in Volovské vrchy, Malé Karpaty, Malá Fatra, Veľká Fatra, Veporské vrchy, Západné Tatry, Ďumbierske Tatry, Muránska planina, Popradská kotlina and Považský Inovec in Slovakia, Bükk, Matra, Tokaj-Zempléni-hegyvidék in Hungary and Pieniny in Poland. The largest part of deciduous woodland of Carpathians is composed from beech woods, which are divided into tree ecological groups. Beech and mixed beech-fir woods are within *Fagion sylvaticae* alliance. *Luzulo-Fagion* alliance represents acidophilous beech forests and *Cephalantero--Fagion* are thermophilous beech forests mostly on limestone. *Pulsatillo slavicae-Pinion* are relict pine and larch forests on calcareous substrate in the Carpathians. It is endemic habitat which provides good ecological conditions for many endemic species. As an example we can mention *Pulsatilla slavica*, which is Western Carpathian endemic.

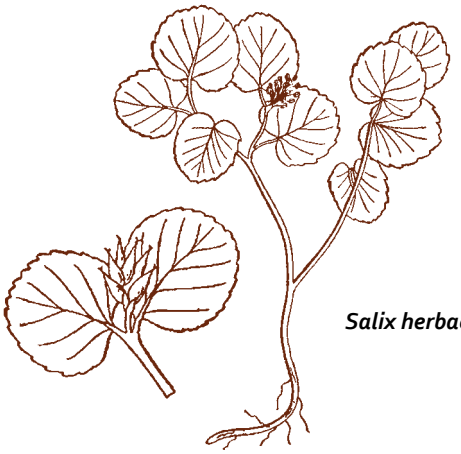
Pulsatilla slavica

Pulsatillo slavicae-Pinion

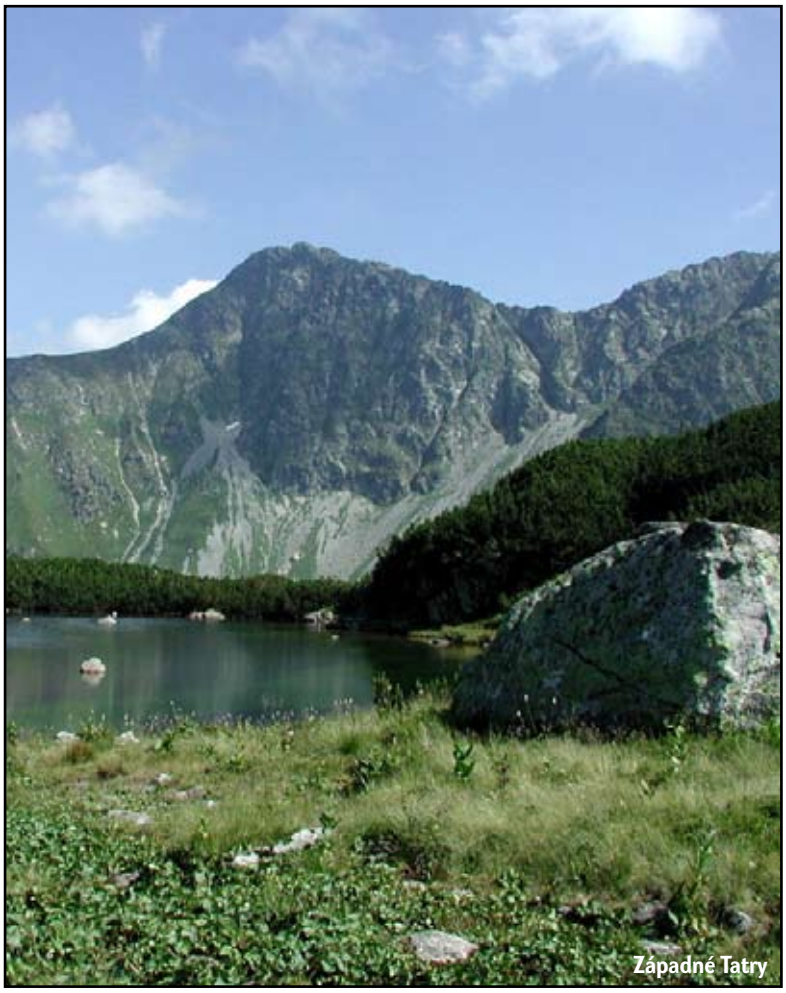


Open and semi-natural habitat types

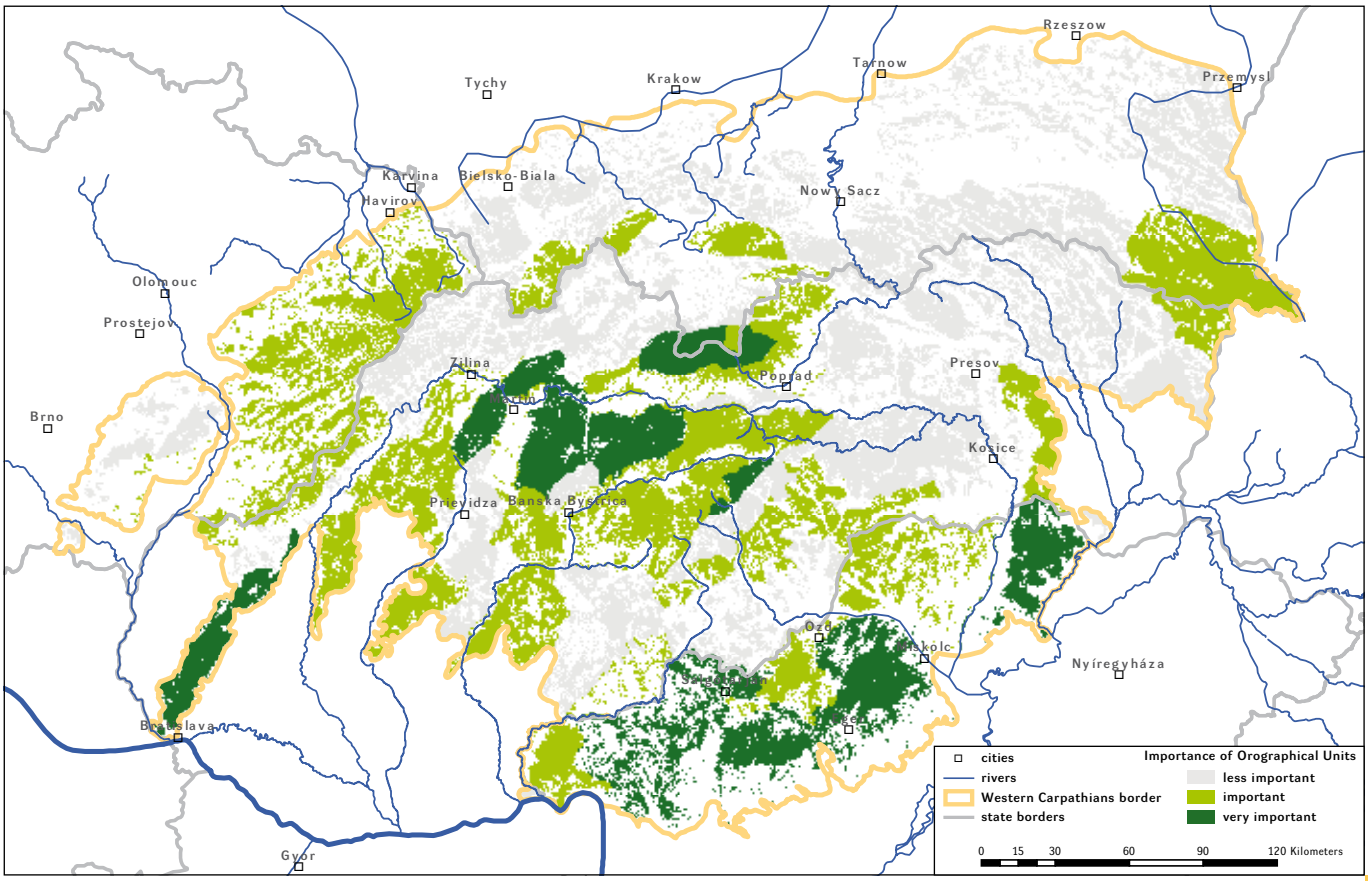
Of the 137 habitat types identified, 78 % are open and semi-natural habitats, which support valuable biodiversity. Very important orographical units are Veľká Fatra, Ďumbierske Tatry, Západné Tatry, Muránska planina, Malé Karpaty and Malá Fatra in Slovakia, Tatry Zachodnie and Tatry Wschodnie in Poland, Cserhát and Tokaj-Zempléni-hegyvidék in Hungary. It includes the whole scale of habitats from fresh water habitats, mires, grasslands, screes and scrubs. For example, *Salicion herbaceae* are dwarf-willow and moss dominated communities of snow-beds on lime-poor soils and rocks.



Salix herbacea



Západné Tatry

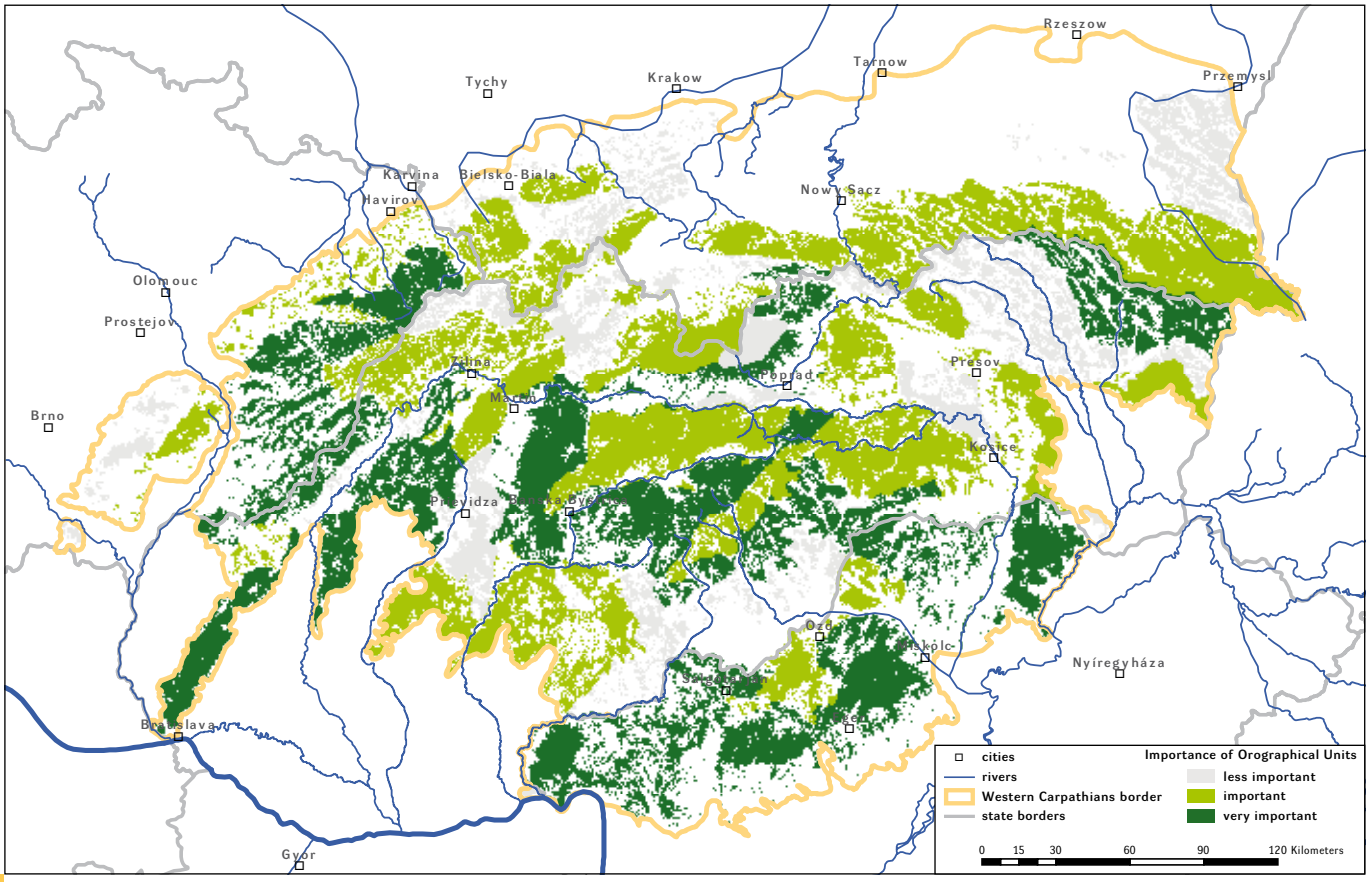


Grassland habitat types

Meadows and pastures are the most widespread semi-natural habitats in the Western Carpathians. They were created by man and conditioned by traditional and present management. Meadows are mostly species-rich and greatly enhance local species diversity. We have 21 grassland alliances in the database. From the map showing the data on the distribution of these features in the Western Carpathians it is evident that very important orographical units are Veľká Fatra, Liptovská kotlina and Biele Karpaty in Slovakia, Cserhát, Mátra and Tokaj-Zempléni-hegyvidék in Hungary, Bílé Karpaty in the Czech Republic, Pieniny in Poland. For example montane mesophilous meadows of the alliance *Polygono bistortae-Trisetion flavescentis* are typical semi-natural grasslands occurred mainly as small islands over calcareous bedrocks. In the past the meadows were cut twice a year in combination with occasional grazing. Recently, most of these meadows remain unmown and they are seriously endangered by succession and afforestation.

Trisetum flavescens

Polygono bistortae-Trisetion flavescentis

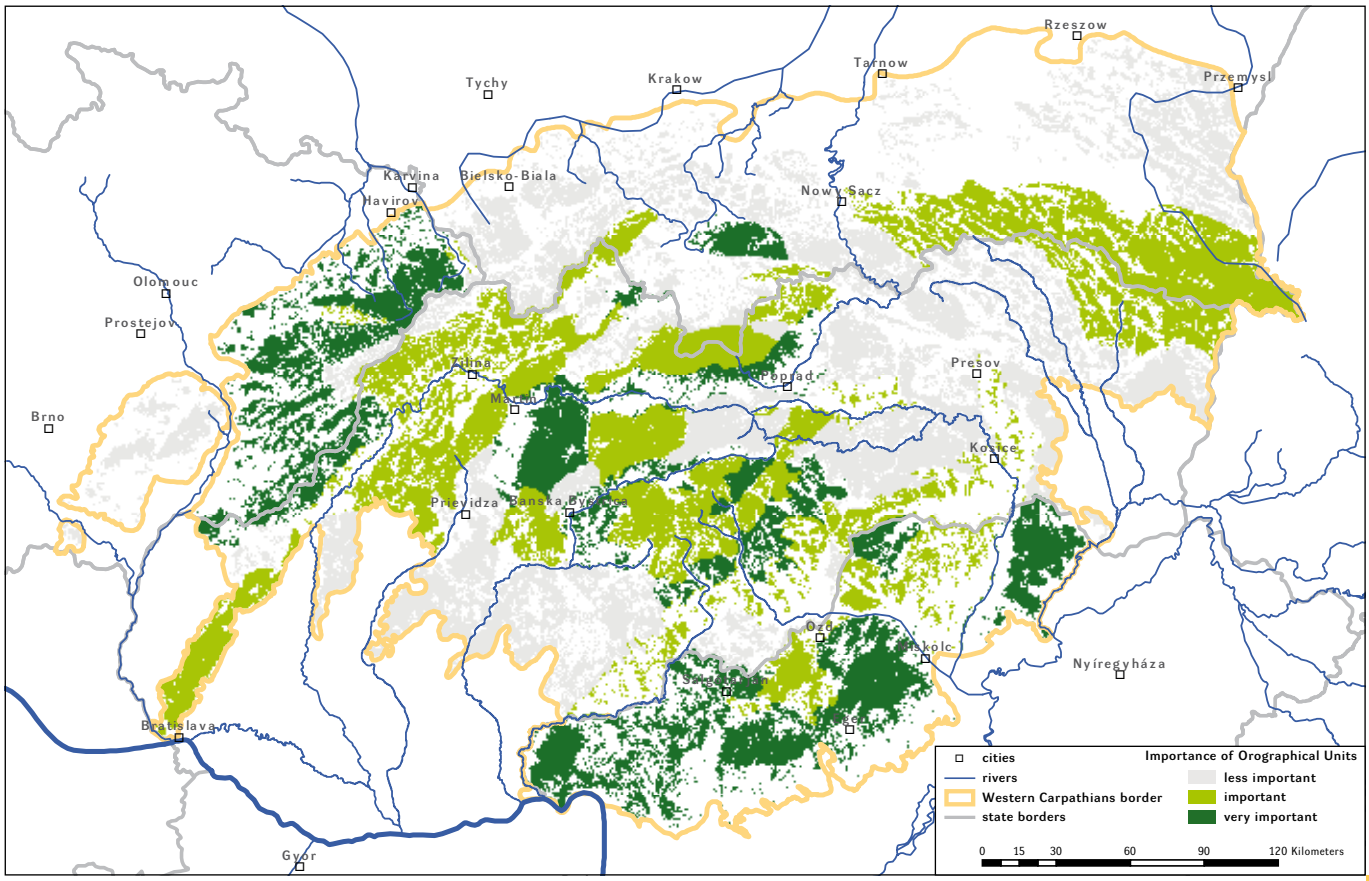


Wetland habitat types

Wetlands in the Carpathians are usually small scale, but their diversity is high. We have 51 wetland habitats in the database. From the map showing the data on the distribution of these features in the Western Carpathians it is evident that very important orographical units are Cserhád in Hungary, Popradská kotlina, Liptovská kotlina, Turčianska kotlina, Revúcka vrchovina, Veľká Fatra and Biele Karpaty in Slovakia, Bílé Karpaty in Czech Republic and Gorce in Poland. Fens are typical small scale wetlands of the Carpathians, characteristic by accumulation of peat in anaerobic conditions. Alkaline fens of *Caricion davallianae* alliance is a community of open low-growing small sedge vegetation. *Caricion fuscae* is vegetation of acid oligo-mesotrophic fens.

Carex davalliana

Rakša, Turčianska kotlina



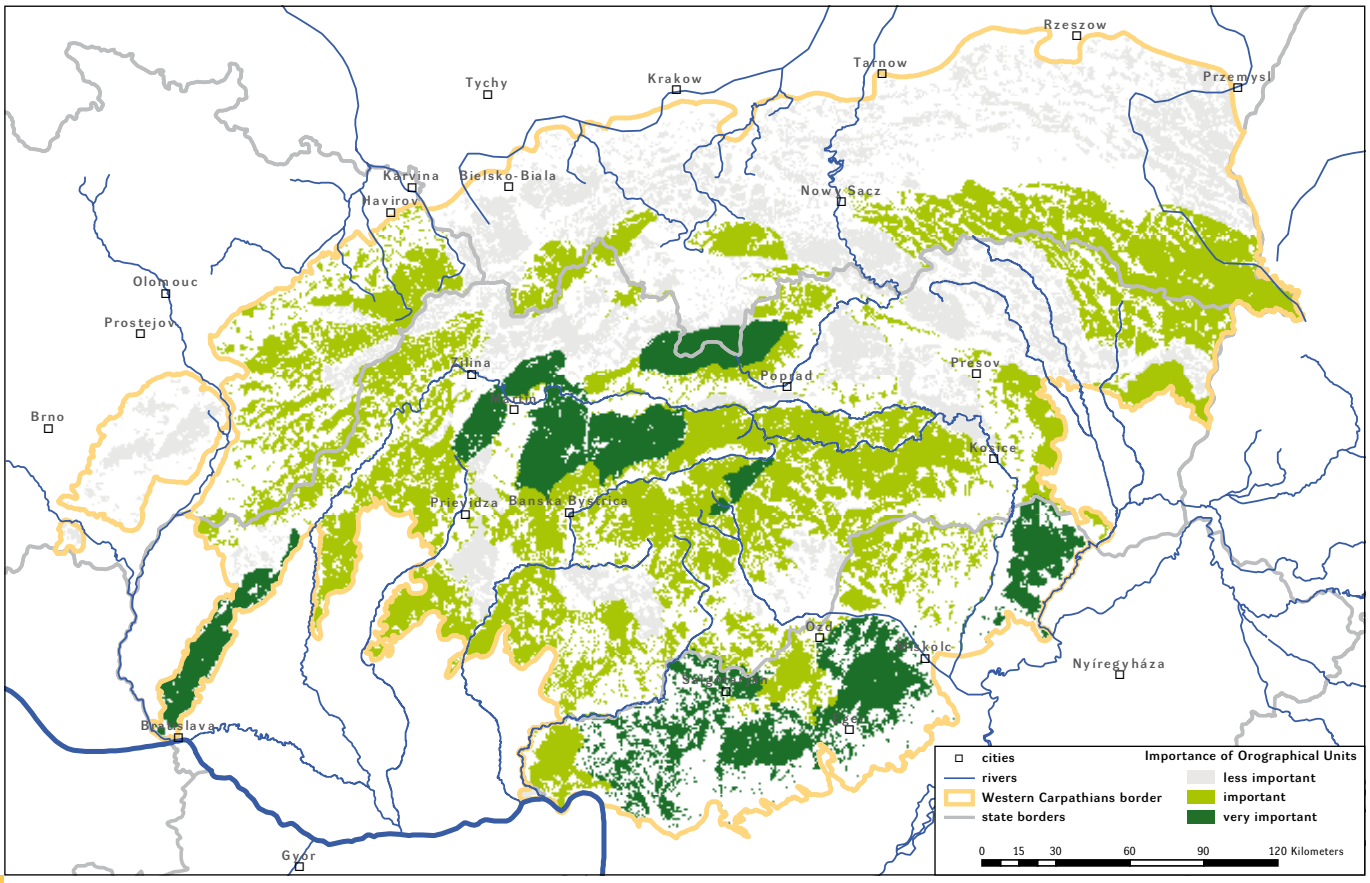
Natura 2000 habitat types

Vegetation classification is a basis for interpretation of habitats of European conservation interest within Natura 2000 network. We have recorded 99 habitats of European importance and out of them are 32 priority habitats within Western Carpathians. Very important orographical units are Bükk, Cserhát and Tokaj-Zempléni-hegyvidék in Hungary, Tatry Zachodnie and Tatry Wschodnie in Poland, Veľká Fatra, Západné Tatry, Malá Fatra and Muránska planina in Slovakia. For example habitat 6210 are Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*). It is defined as priority habitat when it is important orchid site. It covers range of dry grassland alliances as *Bromion erecti*, *Cirsio-Brachypodion pinn*ati and *Festucion valesiacae*. They are among the most species-rich plant communities in Europe and contain a large number of rare and endangered species.

Bromus erectus

Festuca valesiaca

Hrdzavá dolina, Muránska planina



3.2 Important Carpathian animals

In order to identify the core areas for conservation of animal diversity in the Western Carpathians the 258 focal animal taxa were divided into 6 ecological groups with the following number of taxa included:

Ecological group	Number of taxa	Number of endemic taxa
Alpine	28	17
Forest	104	47
Non-forest	44	12
Underground habitats	3	1
Water	51	17
Wetland	18	4
TOTAL	**248**	**98**

The data on the distribution of animal taxa in the Western Carpathians were then compiled into several synthetic maps based on the affiliation of taxa to the ecological group and endemism. Special synthetic map presenting data on the 96 Habitats Directive Annex II taxa of all ecological groups was also developed.

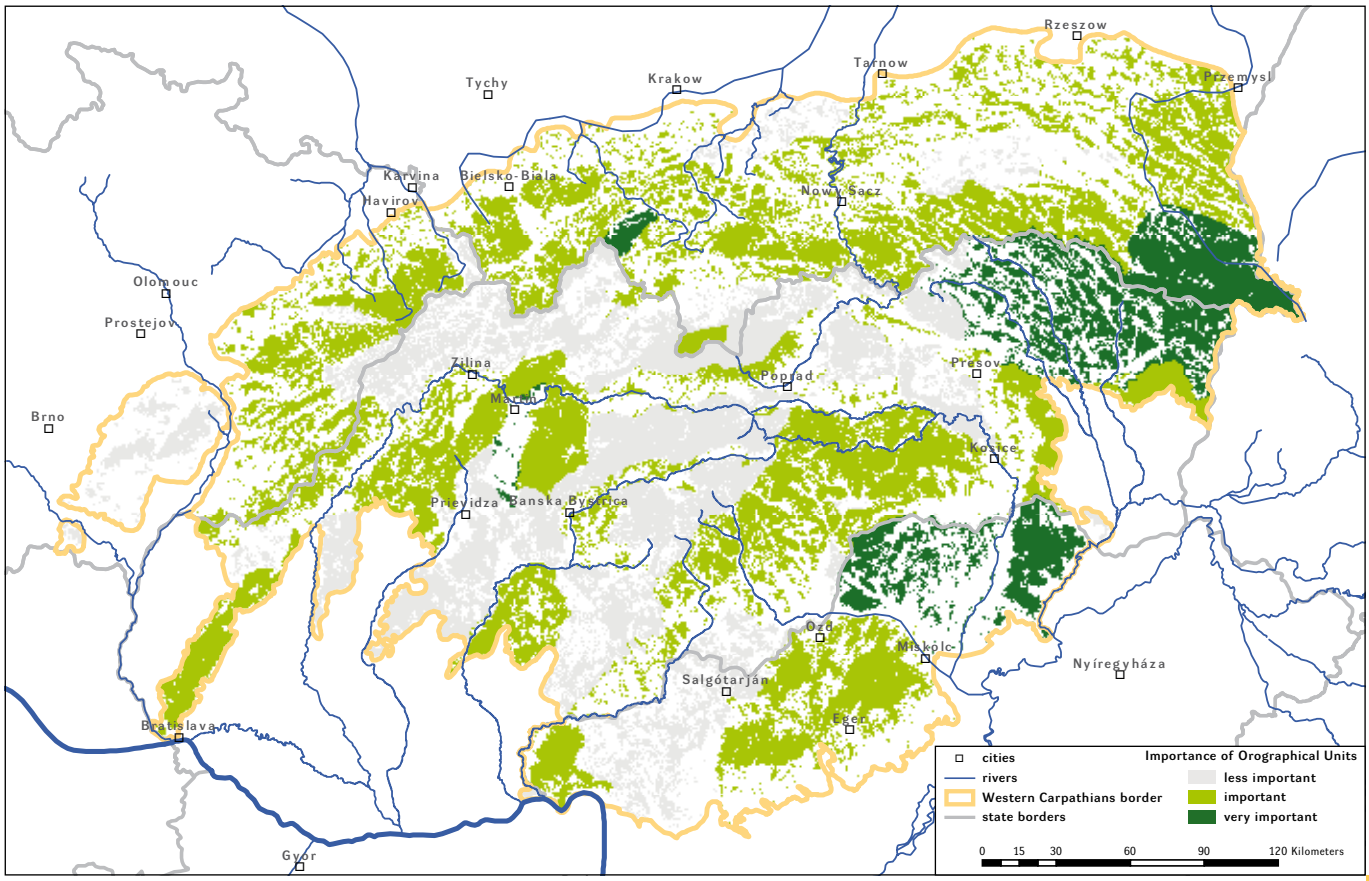
Eudontomyzon danfordi

Wetland and fresh water animals

From the map showing the data on the distribution of these features in the Western Carpathians it is evident that very important orographical units for wetland and fresh water animals include Aggtelek-Rudabányai-hegyvidék, Borsodi-dombság, Börzsöny, Bükk, Cserehát and Tokaj-Zempléni-hegyvidék in Hungary, Bieszczady Zachodnie and Pasmo Babiogórskie in Poland and Beskydské predhorie, Bukovské vrchy, Košická kotlina, Laborecká vrchovina, Ondavská vrchovina, Považské podolie and Turčianska kotlina in Slovakia. These orographical units are important for number of animal taxa, such as endemic fresh water lamprey *Eudontomyzon danfordi*, number of fish e.g. *Barbus meridionalis* (*B. carpathicus*), *Gobio albipinnatus*, *G. kessleri*, *Misgurnus fossilis*, *Sabanejewia aurata*, *Zingel streber*, amphibians e.g. endemic *Triturus montandoni*, invertebrates – *Coenagrion ornatum*, *Leucorrhinia pectoralis*, *Unio crassus*, *Vertigo angustior*, *V. geyeri*, *V. moulinsiana*, *Sadleriana pannonica*.

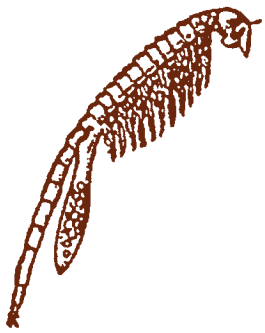
Unio crassus

Vertigo geyeri



Alpine animals

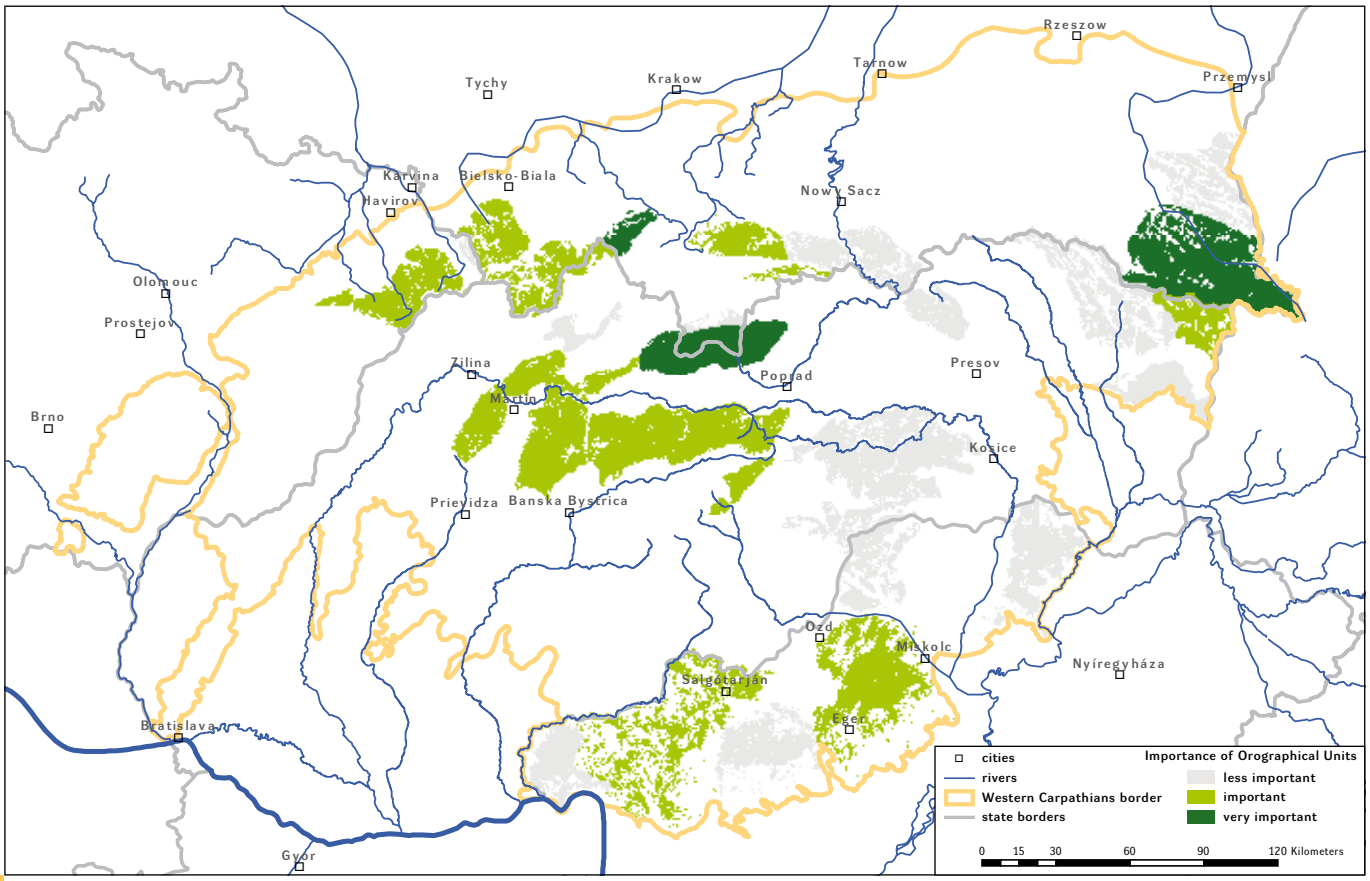
In case of animal taxa connected to alpine habitats the most important orographical units in the Western Carpathians are Tatry Wschodnie, Tatry Zachodnie, Pasmo Babiogórskie, Bieszczady Zachodnie in Poland, Vysoké Tatry, Západné Tatry and Belianske Tatry in Slovakia. Here the alpine habitats host several important animal species including endemic invertebrates *Duvaliopsis pilosella*, *Hypogastrura tatrica*, *Carpathobyrrhulus tatricus*, *Faustina cingulella*, *Trechus striatulus* etc., but also vertebrates such as *Microtus tatricus*, *Marmota marmota latirostris* and *Rupicapra rupicapra tatrica*. Other important orographical units with presence of animal taxa connected to alpine habitats include Moravskoslezské Beskydy in the Czech Republic, Bükk and Cserhát in Hungary, Beskid Zywiecki, Beskid Slaski and Gorce in Poland and Ďumbierske Tatry, Kráľovoholské Tatry, Bukovské vrchy, Oravské Beskydy, Veľká Fatra, Malá Fatra, Chočské vrchy and Muránska planina in Slovakia. These units represent vast mountain ranges with presence of noteworthy species such as *Anthus spinoletta*, *Prunella collaris*, *Clubiona alpicola*, *Faustina rossmaessleri*, *Bombus pyrenaeus*, *Branchinecta paludosa*, etc.



Branchinecta paludosa

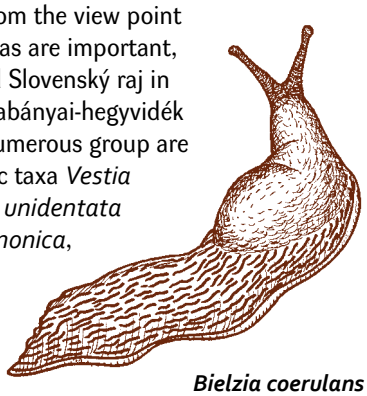
Rupicapra rupicapra tatrica

Veľký Choč



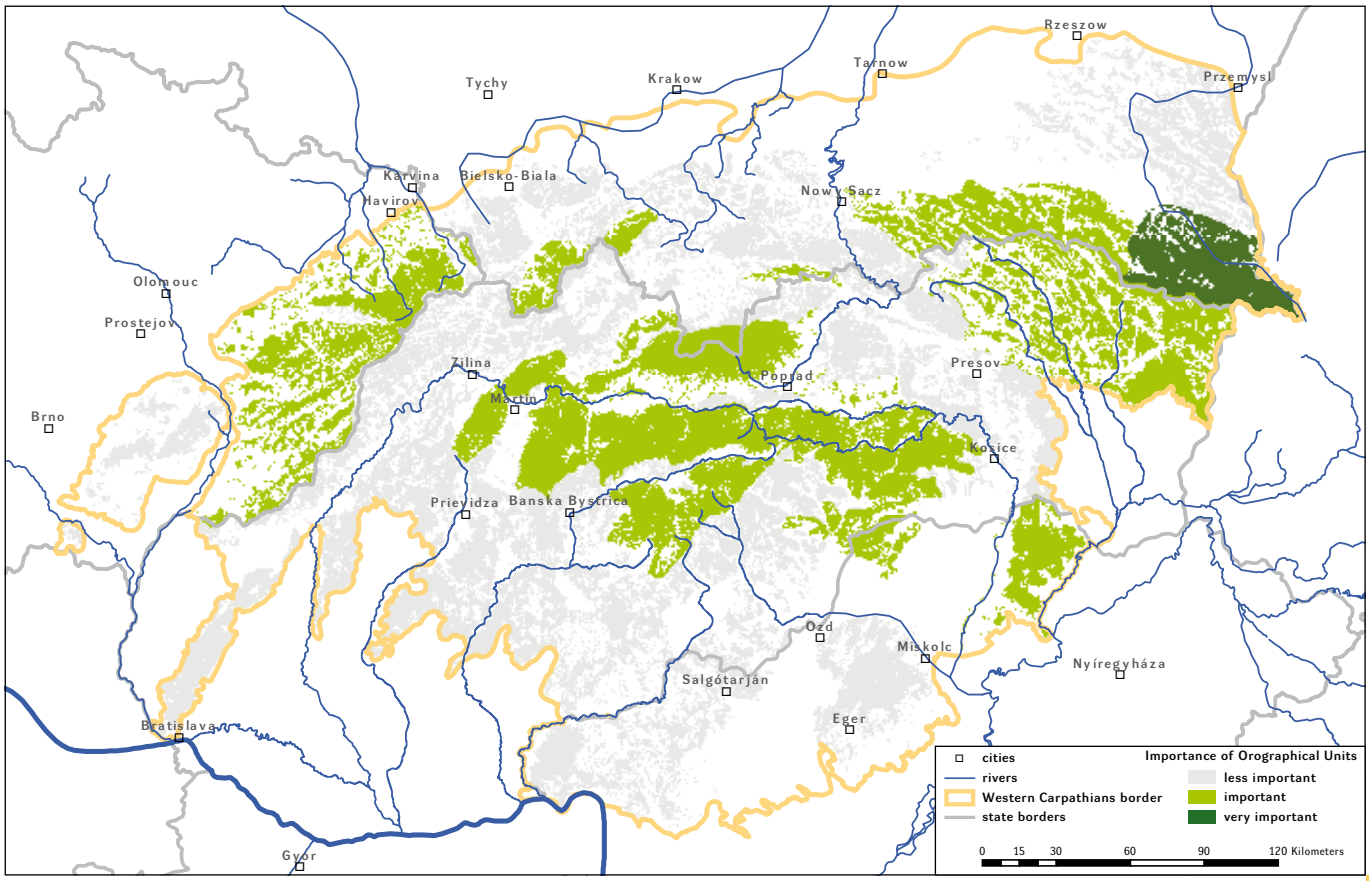
Endemic animals

Based on the analysis the Bieszczady Zachodnie in Poland unanimously holds the highest number of endemic animal taxa (altogether 60 animal taxa). Other orographical units important for animal endemism includes mostly highest mountains such as Pasmo Babiogórskie (29 taxa), Tatry Wschodnie and Tatry Zachodnie in Poland, Moravskoslezské Beskydy (19 taxa) and Bílé Karpaty in the Czech Republic and Bukovské vrchy (20 taxa), Vysoké Tatry, Malá Fatra, Veľká Fatra, Vihorlatské vrchy, Belianske Tatry, Ďumbierske Tatry, Západné Tatry and Liptovská kotlina in Slovakia, etc. These areas hold many endemic taxa such as *Bielzia coerulans*, *Pseudogaurotina excellens*, *Deltomerus carpathicus*, *Duvalius subterraneus*, *Carabus obsoletus*, *Eudontomyzon danfordi*, *Marmota marmota latirostris*, *Microtus tatricus*, *Rupicapra rupicapra tatrica*, *Triturus montandoni*, *Vestia gulo*, *Pterostichus tatricus*, *Sclerophaedon carpathicus*, *Silpha atrata carpathica*, *Leptusa carpathica*, *Spelaeodiscus tatricus*, *Stenus carpathicus* etc. From the view point of endemism also karst areas are important, such as Slovenský kras and Slovenský raj in Slovakia and Aggtelek-Rudabányai-hegyvidék in Hungary. One of most numerous group are molluscs including endemic taxa *Vestia elata*, *V. turgida*, *Petasina unidentata carpatica*, *Sadleriana pannonica*, *Alopia bielzii clathrata*, *Chondrina tatrica* etc.



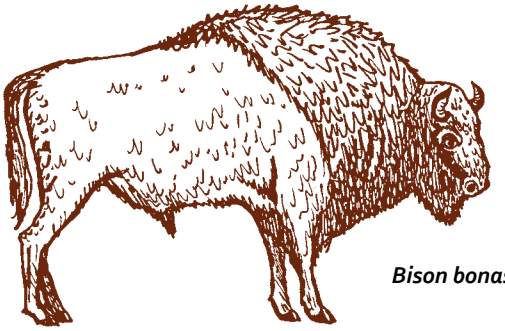
Bielzia coerulans

Triturus montandoni



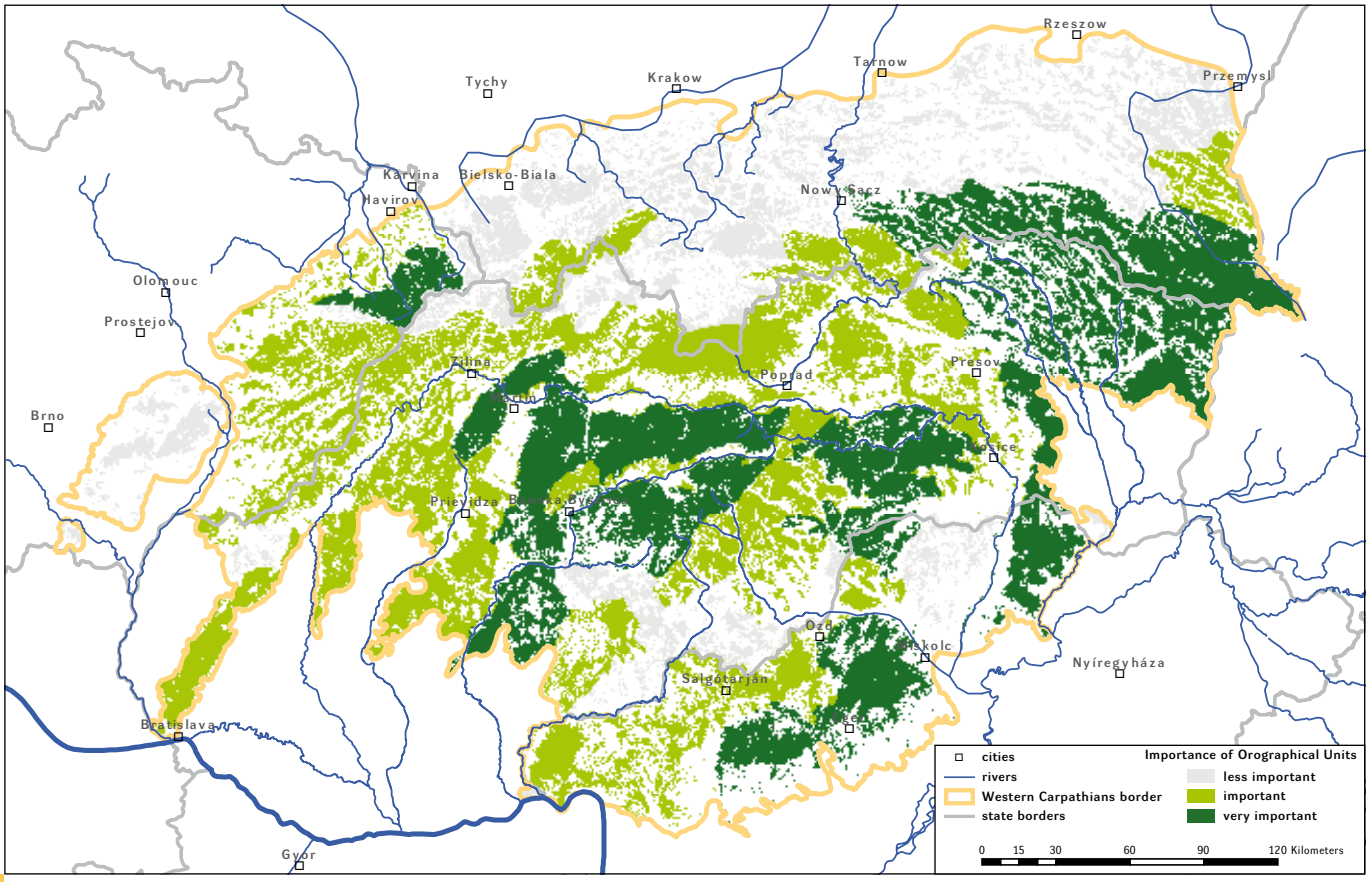
Forest animals

The largest portion of focal animal taxa (104 out of 248 in total) is associated with forest habitat types. The most important orographical unit for this ecological group of animals seems to be the Bieszczady Zachodnie in Poland with the total of 67 taxa present. Other very important orographical units (with more than 35 taxa present) include Tokaj-Zemplé-ni-hegyvidék (46 taxa), Aggtelek-Rudabányai-hegyvidék, Bükk and Mátra in Hungary, Moravskoslezské Beskydy (36 taxa) in the Czech Republic, Bukovské vrchy (44 taxa), Muránska planina, Štiavnické vrchy, Veľká Fatra, Volovské vrchy, Slanské vrchy, Slovenský kras, Vihorlatské vrchy, Malá Fatra, Laborecká vrchovina, Kremnické vrchy, Kráľovoholské Tatry, Poľana, Beskydské predhorie, Ďumbierske Tatry and Zvolenská kotlina in Slovakia, Beskid Niski (35 taxa) in Poland. These units provide favourable conditions for many noteworthy forest animal species of the Western Carpathians including mammals and large carnivores *Bison bonasus*, *Canis lupus*, *Felis sylvestris*, *Lynx lynx*, *Myotis bechsteini*, *Myotis emarginatus*, *Rhinolophus hipposideros*, *Ursus arctos*, birds *Aegolius funereus*, *Aquila chrysaetos*, *A. pomarina*, *Bonasa bonasia*, *Bubo bubo*, *Ciconia nigra*, *Dendrocopos leucotos*, *Falco peregrinus*, *Glaucidium passerinum* etc., amphibians *Bombina variegata*, *Triturus alpestris*, *T montandoni* and many invertebrates e.g. *Carabus zawadszkii*, *Cerambyx cerdo*, *Cucujus cinnaberinus*, *Rosalia alpina*, etc.



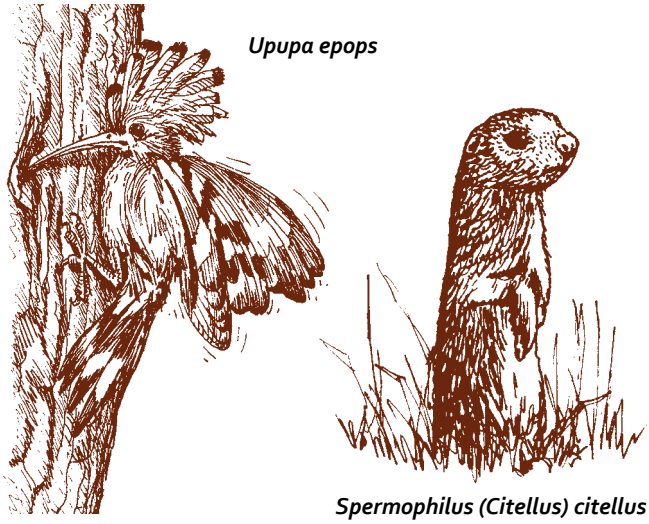
Bison bonasus

Ciconia nigra



Animals of non-forest habitats

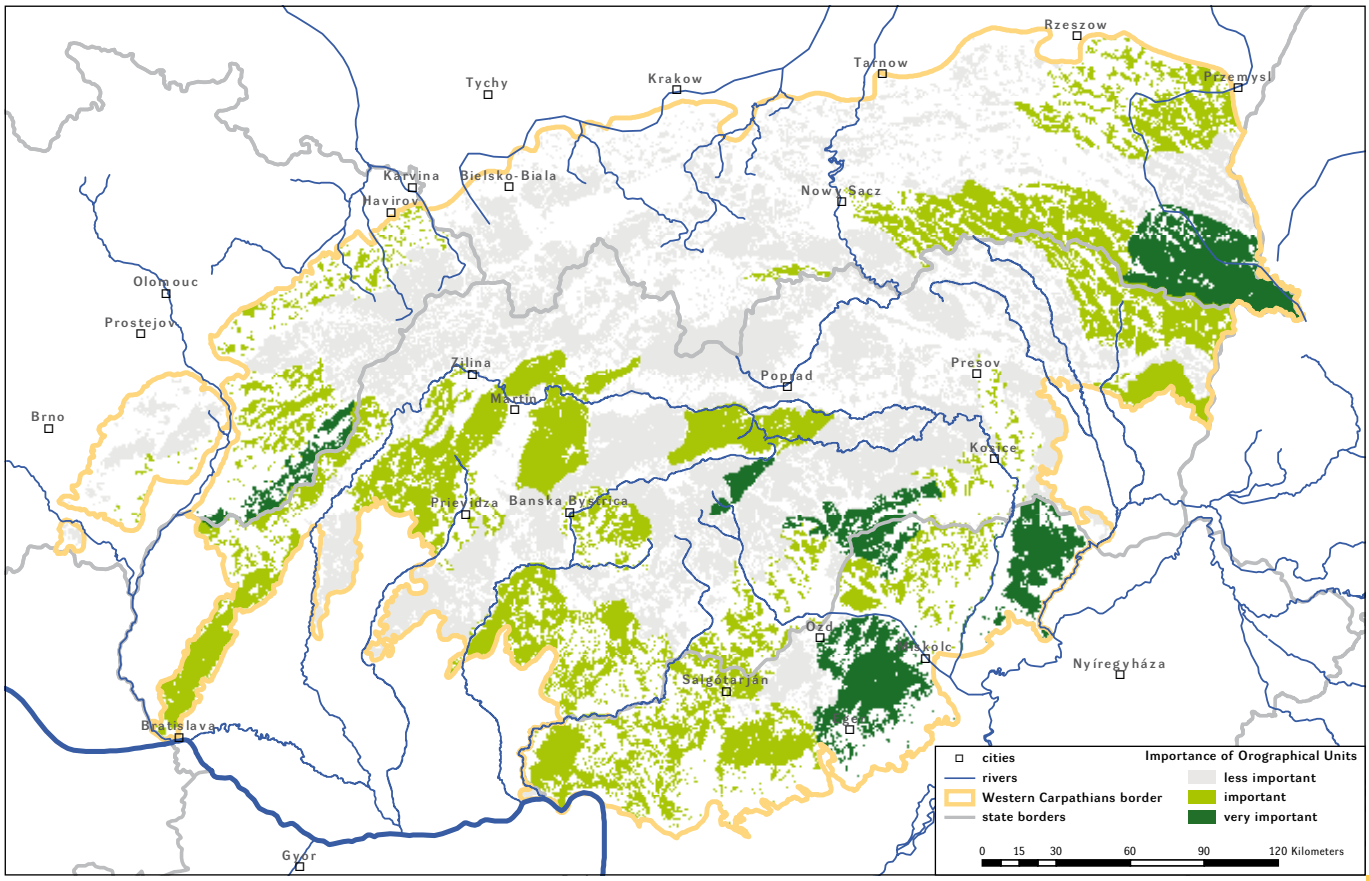
Western Carpathians are also rich in non-forest habitats such as grasslands, rocky habitats, screes and ravines etc. These habitat types host many animal species noteworthy from nature conservation viewpoint. According to our analysis the highest portion of focal animal taxa associated with non-forest habitats is present in orographical units with traditionally high portion of traditionally used (agri-) cultural landscapes such as Bílé Karpaty in the Czech Republic (15 taxa), Tokaj-Zempléni-hegyvidék (24 taxa), Aggtelek-Rudabányai-hegyvidék and Bükk, in Hungary, Bieszczady Zachodnie (17 taxa) in Poland, Slovenský kras (16 taxa) and Muránska Planina in Slovakia. Characteristic taxa of this ecological group include invertebrates *Colias myrmidone*, *Eriogaster catax*, *Lycaena dispar*, *Maculinea alcon*, *M. arion*, *M. nausithous*, *M. teleius*, *Parnassius apollo*, *Isophya costata*, *I. stysi*, *Paracaloptenus caloptenoides*, *Stenobothrus eurasius*, *Pseudopodisma nagyi*, *Plicuteria lubomirskii*, *Helix lutescens*, etc.; birds *Crex crex*, *Emberiza cia*, *Lanius minor*, *Monticola saxatilis*, *Tetrao tetrix*, *Tichodroma muraria*, *Upupa epops* and also mammals such as *Spermophilus* (*Citellus*) *citellus*.



Upupa epops

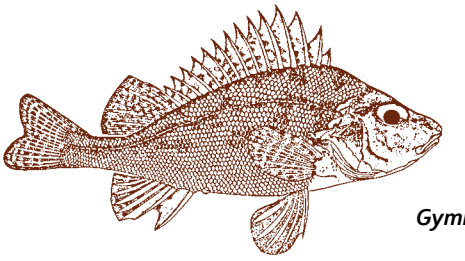
Spermophilus (Citellus) citellus

Maculinea nausithous

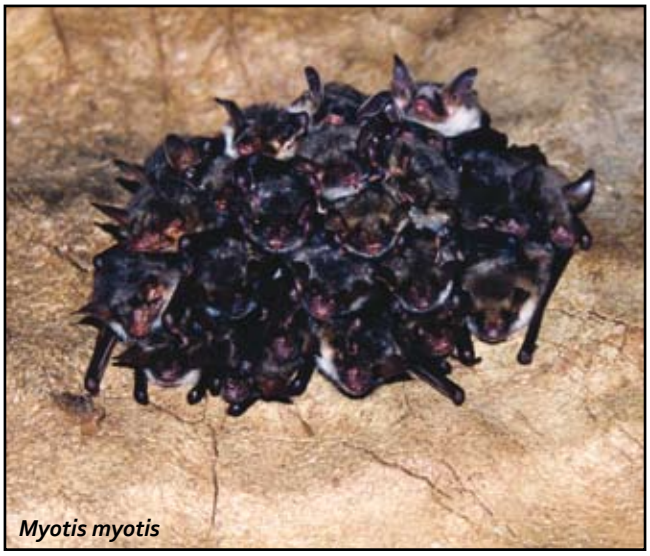


Natura 2000 animals

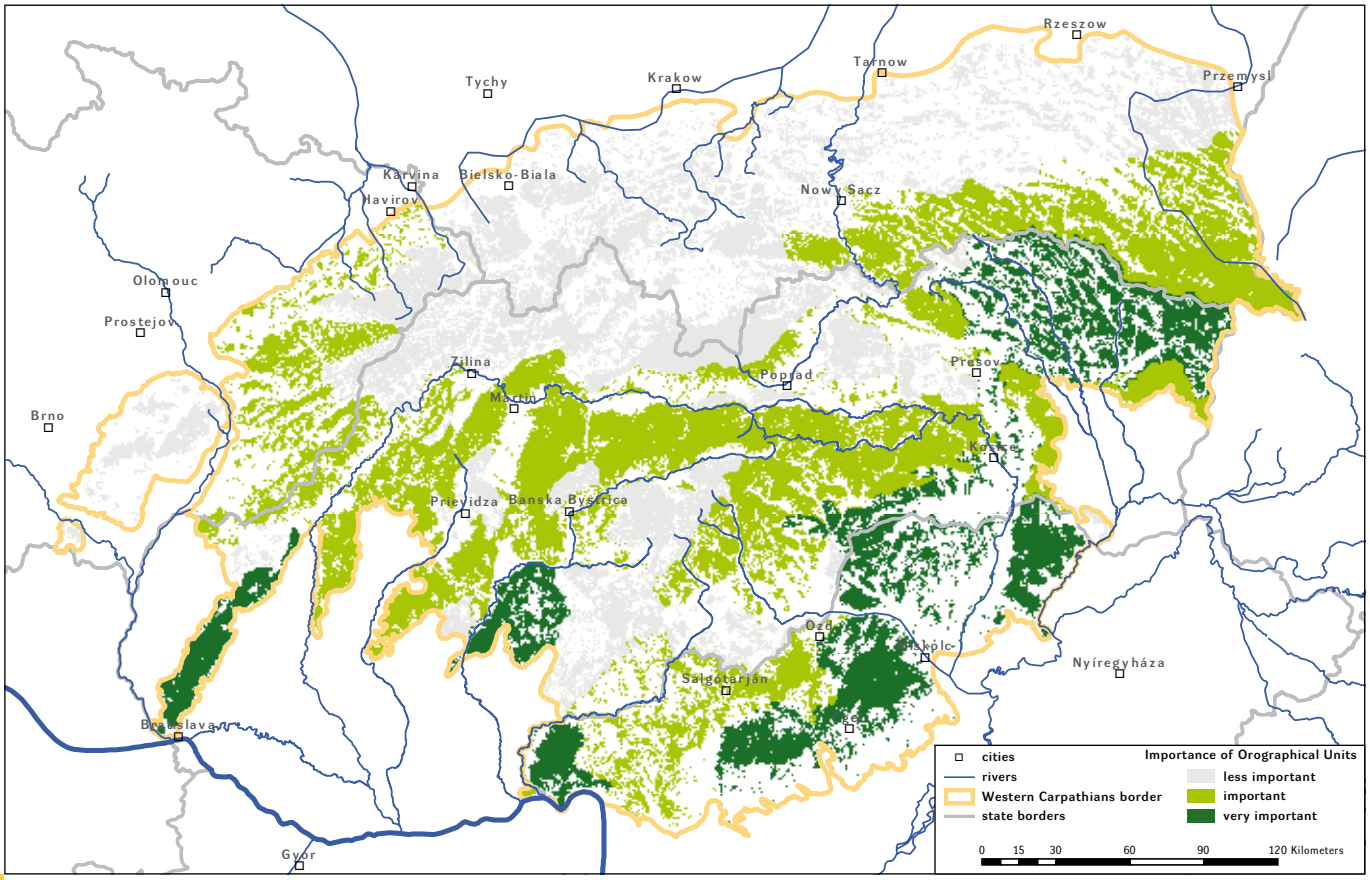
Analysis of the data on the presence of animal taxa listed in Annex II of the EU Habitats Directive 92/43/EC (94 species, 12 of them priority species) shows that the most important orographical units are those located on the borders of biogeographical regions where both mountain (Carpathian) and Pannonian elements are present. The highest number of focal HD Annex II animal taxa was recorded in Aggtelek-Rudabányai-hegyvidék in Hungary (56 taxa). Other orographical units falling into 'very important' category are Tokaj-Zempléni-hegyvidék, Bükk, Börzsöny, Borsodi-dombság and Mátra in Hungary, Košická kotlina, Bukovské vrchy, Malé Karpaty, Štiavnické vrchy, Beskydské predhorie, Ondavská vrchovina, Slovenský kras and Laborecká vrchovina in Slovakia. The variety of HD Annex II animal taxa present in Western Carpathians include fish and lampreys *Aspius aspius*, *Cobitis taenia*, *Cottus gobio*, *Eudontomyzon danfordi*, *E. mariae*, *Gobio kessleri*, *Gymnocephalus baloni*, *Lampetra planeri*, *Zingel streber*, *Z. zingel*, amphibians and reptiles *Bombina bombina*, *B. variegata*, *Emys orbicularis*, *Triturus cristatus*, *T. dobrogicus*, mammals *Barbastella barbastellus*, *Canis lupus*, *Castor fiber*, *Lutra lutra*, *Lynx lynx*, *Miniopterus schreibersi*, *Myotis blythii*, *M. dasycneme*, *M. myotis*, *Rhinolophus euryale*, *R. ferrumequinum*, *Ursus arctos*, invertebrates *Austropotamobius torrentium*, *Cordulegaster heros*, *Dioszeghyana schmidtii*, *Euphydryas aurinia*, *Gortyna borelii lunata*, *Hypodryas maturna*, *Leptidea morsei*, *Lycaena helle*, *Nymphalis vaualbum*, *Bolbelasmus unicornis*, *Boros schneideri*, *Carabus hungaricus*, *C. variolosus*, *C. zawadszkii*, *Cerambyx cerdo*, *Cucujus cinnaberinus*, *Limoniscus violaceus*, *Osmoderma eremita*, *Phryganophilus ruficollis*, *Pholidoptera transsylvanica*, etc.



Gymnocephalus baloni



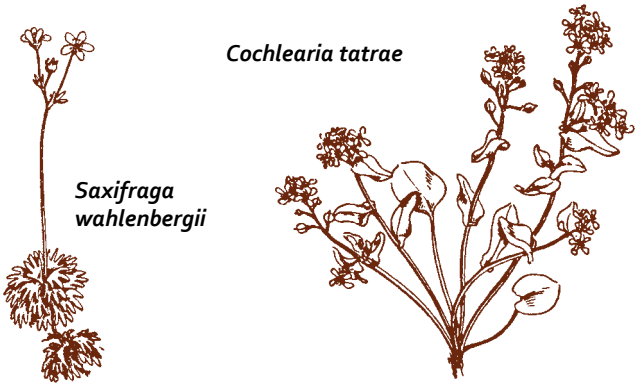
Myotis myotis



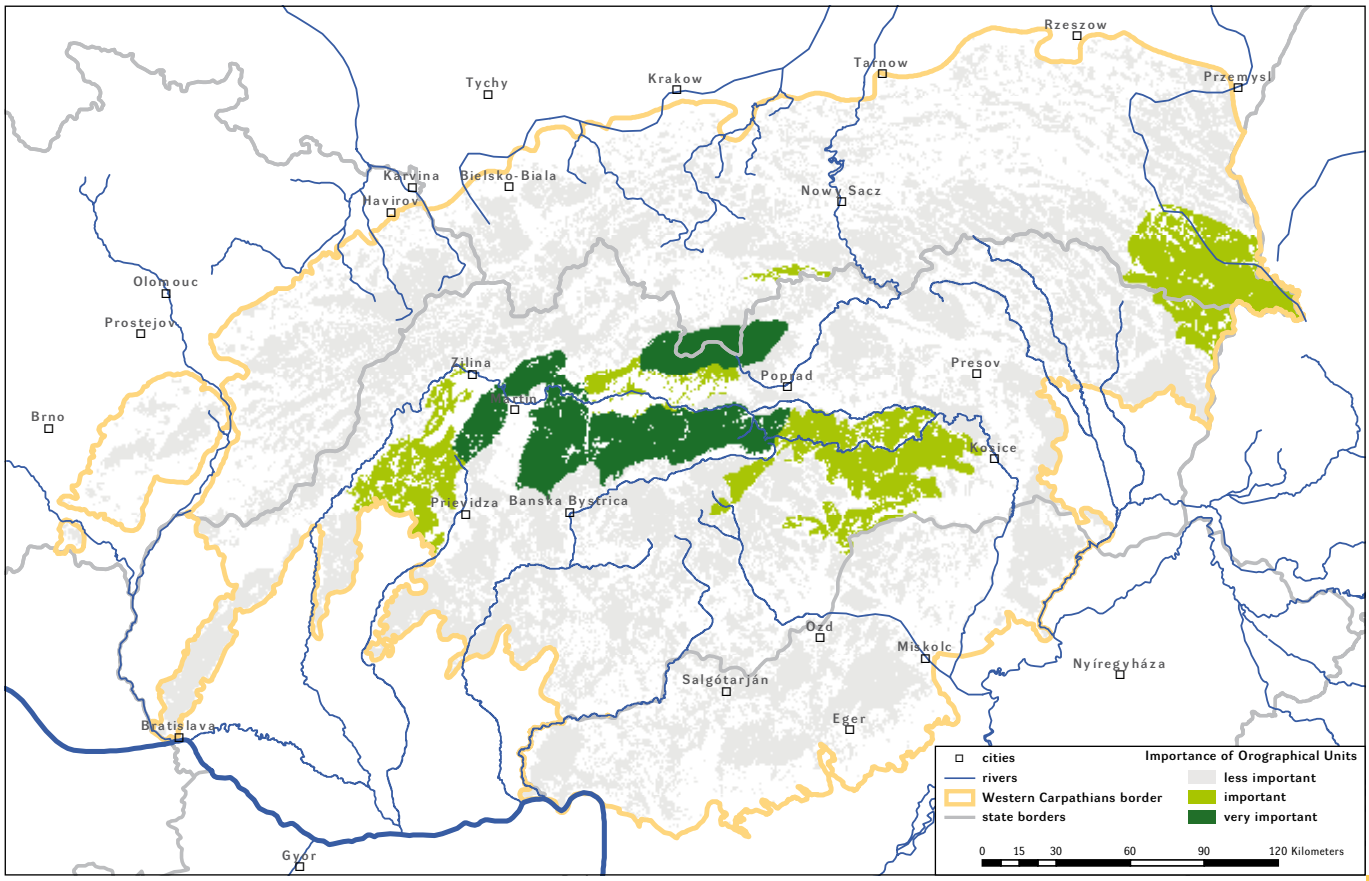
3.3 Carpathian plant species

Endemic plants

Database of the Western Carpathians contains 144 endemic and subendemic plant species (see Annex 5.3). From the map showing the data on the distribution of endemic plants it is evident that very important orographical units are Tatry Zachodnie and Tatry Wschodnie in Poland and Západné Tatry, Belianske Tatry, Vysoké Tatry and Belianske Tatry together with Ďumbierske Tatry and Kráľovoholské (part of the Nízke Tatry Mountains) and Malá a Veľká Fatra in Slovakia. Highest parts of the Carpathians exhibit the greatest richness of endemics. For example *Delphinium oxysepalum*, *Dianthus nitidus* subsp. *nitidus*, *Pulsatilla subslavica* and *Saxifraga wahlenbergii* are assigned to the group of Western Carpathian endemics. *Cochlearia tatrae* is highly stenochoric endemic limited to a single mountain massif (Tatry Mts.).




Belianske Tatry



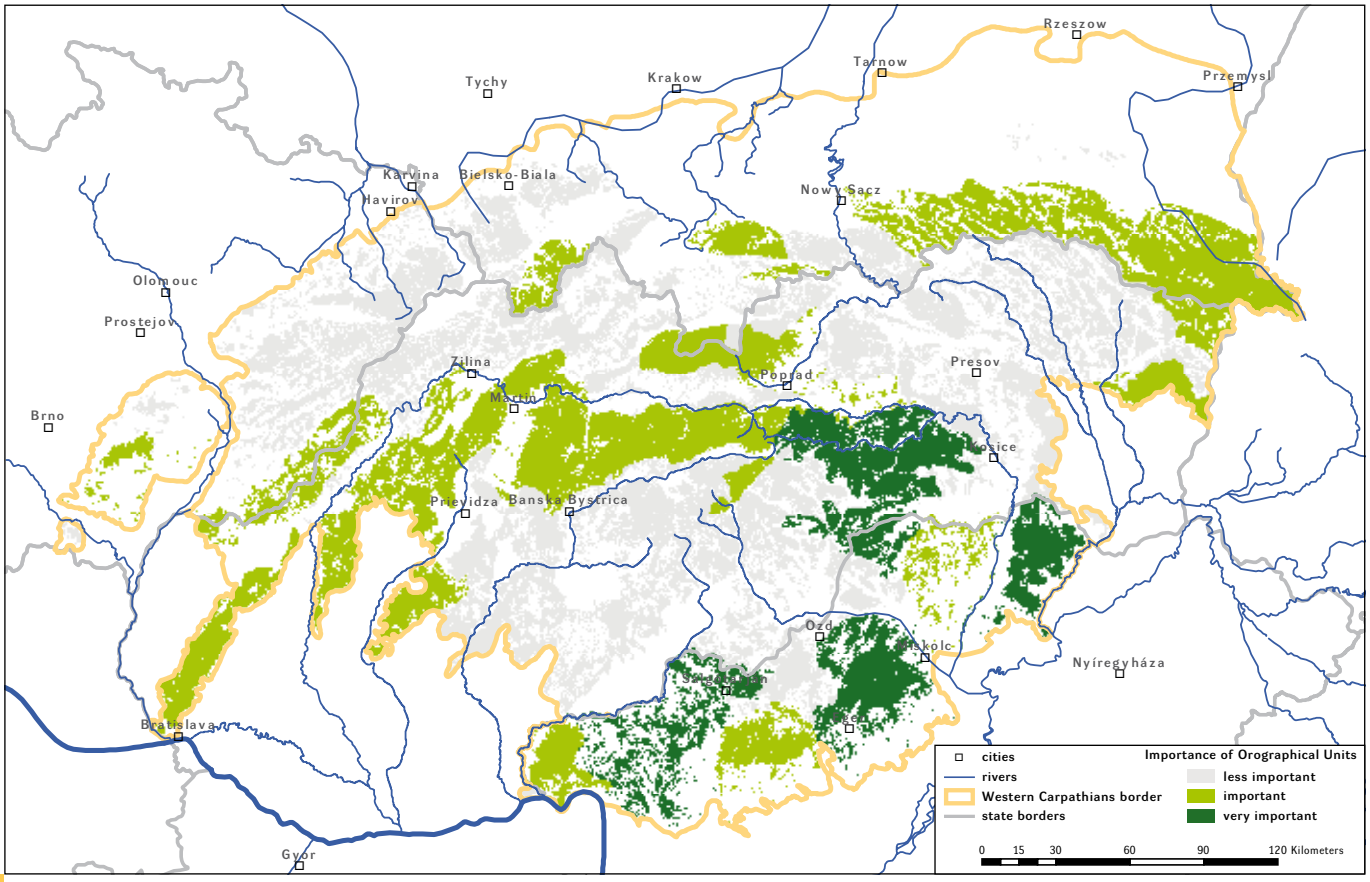
Natura 2000 plants

Database of In Western Carpathians contains 38 (7 of them are priority species) plant species listed in Annex II of the EU Habitats Directive 92/43/EC in total (see Annex). Analysis of the data shows that the most important orographical units are those located on the borders of biogeographical regions where both mountain (Carpathian) and Pannonian elements are present. The highest number of focal HD Annex II plant taxa was recorded in Tokaj-Zempléni-hegyvidékin Hungary and in Slovenský kras in Slovakia. For example *Onosma tornensis* is endemic plant of Slovenský Kras (Slovakia) and Aggtelek-Rudabányai-hegyvidék (Aggteleki-karszt) in Hungary. It is also priority species.

Cyclamen fatrense

Cypripedium calceolus

Onosma tornensis



4. Recommendations, relevance for Carpathian Conventions and further steps

The fall of the Iron Curtain brought about substantial changes in the region's socio-economic and institutional structures. This triggered widespread land use changes which in turn affected local livelihoods, biodiversity, and the provision of ecosystem services. Moreover, today's land use decisions are affected by global climate change, globalization, and the accession of some countries to the European Union, and cannot be analyzed without considering land use legacies from centuries of historic land use.

The Carpathian Convention is a framework type convention pursuing a comprehensive policy and cooperating in the protection and sustainable development of the Carpathians. One of the agreements of the Parties of the Convention is to cooperate in developing an ecological network for the Carpathians. This is a great opportunity to tune the activities towards design of Carpathian Ecological Network, which contribute to implementation of the Carpathian Convention and the adopted Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity (Biodiversity Protocol) and to support synergy. Bearing this in mind, and the scope of the project with one of the key-words „ecological network", the ideas and recommendations presented in this document should be incorporated into the road map for implementation of the Convention. This process brings together leading regional and international experts from the fields of land change science, sustainability science, geography, biodiversity research, and other spheres to work for better understanding of human-environmental systems in a currently understudied region of Eastern Europe – the Carpathian Mountains, define the state-of-the-art in land system analyses in the Carpathians and bridge the gap between different disciplines and stakeholders to define a research agenda of land change science for the Carpathians. The presented document is a tool for the Interim Secretariat of the Carpathian Convention and all the parties to streamline the future actions falling under the relevant articles of the Biodiversity Protocol and make them happen.

CERI is an observer to the Steering Committee of the Carpathian Network of the Protected Areas (CNPA), a thematic network of mountain protected areas in the Carpathian region, established by the decision of the Conference of the Parties to the Carpathian Convention 1/14. The objective of the CNPA is to contribute to the protection and sustainable development of the Carpathians, and in particular goals listed in Article 4 of the Carpathian Convention. This is another platform for cooperation towards synchronized actions supporting implementation of the Convention.

As is evident from the above mentioned, international cooperation was one of the key issues in the course of the project. The activities supported further regional activities in the Carpathians. The most sound of them is a 5-year programme launched in January 2007 by WWF (in the Carpathian region coordinated by WWF – DCP) "Protected Areas for a Living Planet (PA4LP), financed by MAVA foundation. Under the programme the Carpathian Clearing-house Mechanism is being built and the results of our project, namely the Carpathian Biodiversity Information System, will significantly contribute to this interactive internet platform. This platform pools together key governments, NGOs, scientific institutions and other relevant civil society partners to harmonize and streamline activities in the ecoregion, to share experience, galvanize support and build momentum in order to ensure that governments deliver on the targets of the Programme of Work on Protected Areas of the Convention on Biological Diversity. Under this program, these stakeholders are involved to ensure that protected areas provide benefits to local people and contribute to other international development targets. Link to this project is very important to secure wider audience for the outputs for the work presented in this publication.

Further actions from this first step in the identification of core areas in the Western Carpathians shall be primarily in line with the biodiversity Action Plan related to the ecological coherence and connectivity of Natura 2000 system (COM 2006/216) and the Protocol on Conservation and Sustainable Use of Biological and Landscape Diversity to the Framework Convention on the Protection and Sustainable Development of the Carpathians, to safeguard the most important habitats and species and to support biodiversity adaptation to climate change, to enhance the existence and movement of species outside the sites designated for their protection. Due to the current lack of detailed knowledge of the ecological requirements of many species and habitats particular attention shall be paid to scientific work and transboundary cooperative research. Crucial aspect to safeguard the natural treasury of species and habitats in the identified core areas will also be harmonisation of their protection with the existing systems of protected areas, ecological networks and national systems of ecological stability.

5. Annex

5.1 List of alliances

Name: *Aceri tatarici-Quercion* Zólyomi 1957 **Description:** Xerophilous oak woods with dominance of *Quercus robur*, *Quercus cerris* and *Quercus pubescens* of deep soils	**Annex I:** yes priority **Endemism:** –
Name: *Adenostylion alliariae* Br.-Bl. 1926 **Description:** Subalpine tall herb vegetation	**Annex I:** yes **Endemism:** –
Name: *Alnion glutinosae* Malcuit 1929 **Description:** Alder and willow woodlands of swamps, fens and wet pastures	**Annex I:** – **Endemism:** –
Name: *Alnion incanae* Pawłowski in Pawłowski, Sokolowski et Walisch 1928 **Description:** Ash and alder woodland communities of flushed lime-rich soils	**Annex I:** yes priority **Endemism:** –
Name: *Alnion viridis* Aichinger 1933 **Description:** Subalpine shrubs with Alnus viridis	**Annex I:** – **Endemism:** –
Name: *Alopecurion pratensis* Passarge 1964 **Description:** Meadows of moderately to very nutrient-rich soils dominated by graminoids, located in floodplains	**Annex I:** yes **Endemism:** –
Name: *Alysso alyssoidis-Sedion albi* Oberdorfer et Müller in Müller 1961 **Description:** Open xerothermophile pioneer communities on calcareous or base-rich soils with dominance of spring therophytes and succulents	**Annex I:** yes priority **Endemism:** –
Name: *Androsacion alpinae* Br.-Bl. in Br.-Bl. et Jenny 1926 **Description:** Communities of siliceous-neutral screes and moraines	**Annex I:** yes **Endemism:** –
Name: *Androsacion vandelii* Br.-Bl. in Br.-Bl. et Jenny 1926 corr. Br.-Bl. 1948 **Description:** Open vegetation of siliceous rocks in the alpine and nival belt	**Annex I:** yes **Endemism:** –
Name: *Arabidion alpinae* Beguin 1972 **Description:** Limestone screes in the montane belt in the shaded gorges and partly in subalpine belt	**Annex I:** yes **Endemism:** –
Name: *Arabidion coeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926 **Description:** Chionophilous communities of stabilised screes on calcareous bedrock	**Annex I:** yes **Endemism:** endemic
Name: *Arabidopsion thalianae* Passarge 1964 **Description:** Acidophilous vegetation of spring therophytes and succulents	**Annex I:** yes **Endemism:** –
Name: *Arrhenatherion* Koch 1926 **Description:** Mesophyle grasslands with dominance of *Arrhenatherum elatior* at lower altitudes	**Annex I:** yes **Endemism:** –
Name: *Artemisio-Kochion* Soó 1959 **Description:** Pannonian loess steppes grasslands of eroded and steep slopes	**Annex I:** yes **Endemism:** –
Name: *Asplenio-Festucion glaucae* Zólyomi 1936 **Description:** Sub-pannonic dry steppe grasslands of vulcanite and serpentine bedrocks	**Annex I:** yes priority **Endemism:** –
Name: *Asplenion septentrionalis* Oberd. 1938 **Description:** Low altitude fern-rich crevice vegetation on siliceous substarate	**Annex I:** yes **Endemism:** –
Name: *Astero alpini-Seslerion calcariae* Hadač ex Hadač et al. 1969 **Description:** Grassland communities on calcareous soils in subalpine and alpine zone	**Annex I:** yes **Endemism:** partialy endemic
Name: *Athyrio alpestris-Piceion* Sýkora 1971 **Description:** Montane Athyrium distentifolium spruce forests	**Annex I:** yes **Endemism:** –
Name: *Atropion* Br.-Bl. 1930 emend. Oberd. 1957 **Description:** Herbaceous forest-clearing communities associated with deciduous forests on nutrient rich soils	**Annex I:** – **Endemism:** –
Name: *Berberidion vulgaris* Br.-Bl. 1950 **Description:** Thermophilous scrub on sunny, stony slopes	**Annex I:** – **Endemism:** –
Name: *Betulion pubescentis* Lohmayer et Tx. in Tx. 1955 **Description:** Birch-dominated swampy woodlands	**Annex I:** yes priority **Endemism:** –

Name: *Bidention tripartiti* Nordhagen 1940 em. R. Tx. in Poli et J. Tx. 1960 **Description:** Pioneer vegetation dominated by nutrient demanding summer annuals on periodically flooded bottoms and edges of water budies	**Annex I:** – **Endemism:** –
Name: *Bromion erecti* Koch 1926 **Description:** Meso-xeric swards in sub-oceanic regions	**Annex I:** yes priority **Endemism:** –
Name: *Bromo pannonici-Festucion pallentis* Zólyomi 1966 **Description:** Open xerophylous rocky calcareous grasslands of sunny aspects on northern fringes of the Pannonian basin	**Annex I:** yes **Endemism:** –
Name: *Calamagrostion arundinaceae* (Luquet 1926) Jeník 1961 **Description:** Tall-grass species-rich communities on dry soils of the upper montane and subalpine belts	**Annex I:** – **Endemism:** –
Name: *Calamagrostion variae* Sillinger 1931 **Description:** Calcareous meso-hygrophilous tall-grass montane to subalpine grasslands in the Carpathians	**Annex I:** – **Endemism:** partially endemic
Name: *Calamagrostion villosae* Pawł. et al. 1928 **Description:** Tall-herb and fern communities of acidic and more impoverished soils	**Annex I:** – **Endemism:** partially endemic
Name: *Calthion* R. Tx. 1937 **Description:** Wet meadows and pastures of fertile, often manured soils	**Annex I:** – **Endemism:** –
Name: *Cardaminion amarae* Maas 1959 **Description:** Sciophilous communities of acid or sub-neutral forest springs	**Annex I:** – **Endemism:** –
Name: *Cardamino-Montion* Br.-Bl. 1926 **Description:** Spring vegetation of base-poor waters	**Annex I:** – **Endemism:** –
Name: *Carici piluliferae-Epilobion angustifolii* R. Tx. 1950 **Description:** Herbacous forest-clearing communities associated with deciduous forests on nutrient poor soils	**Annex I:** – **Endemism:** –
Name: *Caricion curvulae* Br.-Bl. 1925 **Description:** Alpine acid swards of Alps and eastern and southern Carpathians	**Annex I:** yes **Endemism:** –
Name: *Caricion davallianae* Klika 1934 **Description:** Small-sedge rich vegetation of calcareous fens	**Annex I:** yes priority **Endemism:** –
Name: *Caricion firmae* Gams. 1926 **Description:** Calcareous open sedge swards on terraced slopes in the alpine belt	**Annex I:** yes **Endemism:** –
Name: *Caricion fuscae* Koch 1926 em. Klika 1934 **Description:** Vegetation of acid oligo-mesotrophic peats or peaty mineral soils	**Annex I:** yes **Endemism:** –
Name: *Caricion gracilis* Neuhäusl 1959 em. Balátová-Tuláčková 1963 **Description:** Tall-sedge wetland communities with fluctuating water regime	**Annex I:** – **Endemism:** –
Name: *Caricion lasiocarpae* Vanden Berghen in Lebrun et al. 1949 **Description:** Mires developing on more mesotrophic peats	**Annex I:** yes **Endemism:** –
Name: *Caricion remotae* Kästner 1941 **Description:** Soft-water spring communities dominated by phanerogams	**Annex I:** – **Endemism:** –
Name: *Caricion rostratae* Balátová-Tuláčková 1963 **Description:** Tall-sedge wetland communities with high underground water level	**Annex I:** – **Endemism:** –
Name: *Carpinion betuli* Issler 1931 **Description:** Broadleaved woodlands rich in hornbeam on lime-rich and neutral mud soils	**Annex I:** yes priority **Endemism:** –
Name: *Cephalantero-Fagenion* R. Tx. in R. Tx. et Oberd. 1958 **Description:** Thermophilous beech forets mostly on limestone	**Annex I:** yes **Endemism:** –
Name: *Charion fragilis* Krausch 1964 **Description:** Submerged stonewort swards of lime-rich freshwaters	**Annex I:** yes **Endemism:** –
Name: *Chrysanthemo rotundifolii-Piceion* Krajina (1933) Březina et Hadač in Hadač 1962 **Description:** Herb-rich mesophilous spruce mountain forests	**Annex I:** yes **Endemism:** –
Name: *Cirsio-Brachypodion pinnati* Hadač et Klika ex Klika 1951 **Description:** Meso-xeric swards in sub-continental regions	**Annex I:** yes priority **Endemism:** –
Name: *Corylo-Populion tremulae* Br.-Bl. 1961 **Description:** Secondary forests of disturbed areas	**Annex I:** – **Endemism:** –
Name: *Cratoneurion commutati* Koch 1928 **Description:** Calcareous spring communities, commonly dominated by mosses	**Annex I:** yes priority **Endemism:** –
Name: *Cratoneuro filicini-Calthion laetae* Hadač 1983 **Description:** Plant communities of high mountain and mountain oligotrophic springs	**Annex I:** – **Endemism:** –
Name: *Cymbalario-Asplenion* Segal 1969 em. Mucina 1993 **Description:** Plant communities of walls and rocks.	**Annex I:** – **Endemism:** –
Name: *Cynosurion* R. Tx. 1947 **Description:** Pastures of relatively well drained, fertile mineral soils at lower altitudes	**Annex I:** – **Endemism:** –
Name: *Cystopteridion* Richard 1972 **Description:** Crevice communities of shaded calcareous rocks	**Annex I:** yes **Endemism:** –

Name: *Deschampsion caespitosae* Horvatić 1930 **Description:** Oligohaline moist tussocky meadows	**Annex I:** yes **Endemism:** –
Name: *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina 1993 in Mucina et al. 1993 **Description:** Open or closed grasslands on calcareous rocky slopes	**Annex I:** yes **Endemism:** –
Name: *Dicrano-Pinion* (Libbert 1933) Matuszkiewicz 1962 **Description:** Pine and juniper woodland communities of acid soils	**Annex I:** yes priority **Endemism:** –
Name: *Drepanocladion exannulati* Krajina 1933 **Description:** Subalpine, nutrient poor and acid habitats with initial peat formations	**Annex I:** yes **Endemism:** –
Name: *Dryopterido filicis-maris-Athyrion disentifolii* (Holub ex Sýkora et Štursa 1973) Jeník et al. 1980 **Description:** Fern-rich communities are confined to treeless talus slopes around the timberline	**Annex I:** yes **Endemism:** –
Name: *Eriophoro-Pinion sylvestris* Pass. et Hoffm. 1968 **Description:** Mire pine woods	**Annex I:** yes priority **Endemism:** –
Name: *Erysimo-Hackelion deflexae* Bernátová et Obuch 1991 **Description:** Relict nitrophilous communities under stone overhangs in calcareous mountains	**Annex I:** yes **Endemism:** partially endemic
Name: *Fagion sylvaticae* Luquet 1926 **Description:** Beech and mixed beech-fir woods	**Annex I:** yes **Endemism:** –
Name: *Festucion carpaticae* Bělohlávková et Fišerová 1989 **Description:** Tall grass, chionophilous communities of upper montane and subalpine belts of Western Carpathians	**Annex I:** – **Endemism:** endemic
Name: *Festucion picturatae* Krajina 1933 corr. Dúbravcová in Kliment et al. 2007 **Description:** Tall-herb communities in humid depressions and gullies of the alpine belt of the Carpathians	**Annex I:** yes **Endemism:** –
Name: *Festucion pseudovinae* Soó 1933 **Description:** Pontic-Pannonian saline pastures of steppic character	**Annex I:** yes priority **Endemism:** –
Name: *Festucion valesiacae* Klika 1931 **Description:** Sub-continental closed fescue pastures and swards	**Annex I:** yes priority **Endemism:** –
Name: *Festucion versicoloris* Krajina 1933 **Description:** Alpine grassy, cushion forming and dwarf scrub communities on steep, terraced slopes and stable screes	**Annex I:** yes **Endemism:** endemic
Name: *Filipendulenion* (Lohmeyer in Oberd. et al. 1967) Bal.-Tul. 1978 **Description:** Tall-herb vegetation, seldom mown or grazed, on moist fertile mineral soils and peats	**Annex I:** yes **Endemism:** –
Name: *Galeopsion segetum* Oberd. 1957 **Description:** Siliceous screes of hills of western and central Europe	**Annex I:** yes **Endemism:** –
Name: *Genistion* Böcher 1943 **Description:** Submontane and montane heaths	**Annex I:** yes **Endemism:** –
Name: *Genisto germanicae-Quercion* Neuhäusl & Neuhäuslová-Novotná 1967 **Description:** Oak and oak-birch woods	**Annex I:** yes **Endemism:** –
Name: *Geranion sanguinei* R. Tx. in Th. Müller 1961 **Description:** Drought-tolerant communities in sunny woodland edges on calcareous soils	**Annex I:** – **Endemism:** –
Name: *Halo-Trichophorion pumili* Vicherek 1973 **Description:** Carpathian travertine swards	**Annex I:** yes priority **Endemism:** –
Name: *Hydrocharition* Rübel 1933 **Description:** Vegetation of free-floating aquatic macrophytes	**Annex I:** yes **Endemism:** –
Name: *Hyperico perforati-Scleranthion perennis* Moravec 1967 **Description:** Open grasslands on shallow soils on siliceous rocks	**Annex I:** yes **Endemism:** –
Name: *Hypno-Polypodion vulgaris* Mucina 1993 **Description:** Fern and moss rich communities of shaded crevices in the colline to submontane bells	**Annex I:** yes **Endemism:** –
Name: *Juncion trifidi* Krajina 1933 **Description:** Herb and grass communities on siliceous bedrock in the subalpine to subnivale belt	**Annex I:** yes **Endemism:** endemic
Name: *Juniperion nanae* Br.-Bl. et al. 1939 **Description:** Juniper scrub of dry, wind-swept habitats	**Annex I:** – **Endemism:** –
Name: *Koelerio-Phleion phleoidis* Korneck 1974 **Description:** Steppic rocky grasslands and swards of dry and acidic soils	**Annex I:** yes **Endemism:** –
Name: *Lemnion minoris* de Bolós et Masclans 1955 **Description:** Duckweed communities of eutrophic and hypertrophic waters	**Annex I:** yes **Endemism:** –
Name: *Littorellion uniflorae* Koch ex R. Tx. 1937 **Description:** Suboceanic hairgrass swards in oligotrophic standing and slow-flowing waters	**Annex I:** yes **Endemism:** –
Name: *Loiseleurio-Vaccinion* Br.-Bl. 1926 **Description:** Arctic chionophilous heath of wind-swept exposed slopes and summits	**Annex I:** yes **Endemism:** –

Name: *Luzulo-Fagion* Lohm. et R. Tx. in R. Tx. 1954 **Description:** Acidophilous beech forests	**Annex I:** yes **Endemism:** –
Name: *Lycopodio-Cratoneurion commutati* Hadač 1983 **Description:** Communities of calcareous springs	**Annex I:** yes priority **Endemism:** –
Name: *Molinion coerulae* Koch 1926 **Description:** Wet unmanured low-altitude meadows	**Annex I:** yes **Endemism:** –
Name: *Nanocyperion* Koch ex Libbert 1932 **Description:** Pioneer dwarf cyperaceous and therophyte communities on bare, periodically flooded ground	**Annex I:** yes priority **Endemism:** –
Name: *Nardion strictae* Br.-Bl. 1926 **Description:** Dense chionophilous grassy swards of the subalpine and alpine belts	**Annex I:** yes priority **Endemism:** –
Name: *Nardo-Agrostion tenuis* Sillinger 1933 **Description:** Species-rich mat-grass pastures in the mountains	**Annex I:** yes priority **Endemism:** –
Name: *Nardo-Juncion squarrosi* (Oberd. 1957) Passarge 1964 **Description:** Wet Nardus grasslands	**Annex I:** yes priority **Endemism:** –
Name: *Nymphaeion albae* Oberd. 1957 **Description:** Communities of rooted aquatics with floating leaves in sheltered nutrient-rich fresh water	**Annex I:** yes **Endemism:** –
Name: *Oenanthion aquaticae* Hejný ex Neuhäusl 1959 **Description:** Vegetation of small emergent herbs on mud in and by the shallows of streams and ponds	**Annex I:** – **Endemism:** –
Name: *Oxalido-Piceion* Krajina (1933) Březina et Hadač in Hadač 1962 **Description:** Alpine spruce forest at the upper limit	**Annex I:** – **Endemism:** –
Name: *Oxycocco-Empetrion hermaphroditi* Nordh. 1936 **Description:** Boreal and high-altitude chamaephyte-rich raised bogs	**Annex I:** yes priority **Endemism:** –
Name: *Oxytropido-Elynion* Br.-Bl. 1949 **Description:** Kobresia carpets in windy places in the alpine belt	**Annex I:** yes **Endemism:** partialy endemic
Name: *Papaverion tatrici* Pawłowski 1928 corr. Valachovič 1995 **Description:** West Carpathian alpine and subalpine calcareous scree communities	**Annex I:** yes priority **Endemism:** endemic
Name: *Petasition officinalis* Sillinger 1933 em. Kopecký 1969 **Description:** Tall-herb vegetation of raw alluvium soils on montane streamsides	**Annex I:** yes **Endemism:** partialy endemic
Name: *Phalaridion arundinaceae* Kopecký 1961 **Description:** Riverine reed vegetation	**Annex I:** – **Endemism:** –
Name: *Philonotidion seriatae* Hinterlang 1992 **Description:** Communities of oligotrophic springs	**Annex I:** – **Endemism:** –
Name: *Phragmition communis* Koch 1926 **Description:** Swamps and fens dominated by tall graminoids in standing or gently mowing waters and winter-flooded fens	**Annex I:** – **Endemism:** –
Name: *Piceion excelsae* Pawłovski in Pawłovski et al. 1928 **Description:** Spruce and birch related woodland communities	**Annex I:** yes **Endemism:** –
Name: *Pinion mugo* Pawł. 1928 **Description:** Subalpine silicicolous krummholz of mountains	**Annex I:** yes priority **Endemism:** partialy endemic
Name: *Pino-Quercion* Kozl. 1925 em. Mat. et Pol. 1955 **Description:** Acidophilous pine-oak woods	**Annex I:** – **Endemism:** –
Name: *Poion alpinae* Oberd. 1950 **Description:** Cattle pastures of heavy fertile soils in subalpine bet	**Annex I:** – **Endemism:** –
Name: *Polygono-Trisetion* Br.-Bl. et R. Tx. ex Marshall 1947 **Description:** Meadows of well-drained, relatively fertile mineral soils in low-input agricultural systems of montane regions	**Annex I:** yes **Endemism:** –
Name: *Potamion lucentis* Rivas-Martínez 1973 **Description:** Vegetation dominated by floating rooted broad-leaved species	**Annex I:** yes **Endemism:** –
Name: *Potamion pusilii* Hejný 1978 **Description:** Rooted aquatic communities in moderate to deep standing water, often open to winds and waves	**Annex I:** yes **Endemism:** –
Name: *Potentillion anserinae* R. Tx. 1937 **Description:** Low herb communities of variable habitas with wet-dry conditions	**Annex I:** yes **Endemism:** –
Name: *Potentillion caulescentis* Br.-Bl. in Br.-Bl. et Jenny 1926 em. Sutter 1969 **Description:** Vegetation of calcareous rocks and crevices of the subalpine belt	**Annex I:** yes **Endemism:** partially endemic
Name: *Potentillo albae-Quercion petreae* Jakucs in Zólyomi et al. 1967 **Description:** Xerophile and subcontinental oak forests with *Potentilla*	**Annex I:** yes priority **Endemism:** –
Name: *Prunion fruticosae* R. Tx. 1952 **Description:** Low xeric shrub	**Annex I:** yes priority **Endemism:** –
Name: *Pulsatillo slavicae-Pinion* Fajmonová 1978 **Description:** Relict pine and larch forests on calcareous substrate in Carpathians	**Annex I:** yes **Endemism:** partialy endemic
Name: *Quercion petraeae-cerris* (Lakušic 1976) Lakušic et B. Jovanović 1980 **Description:** Xero-mesophilous oak woods with dominance of Quercus petraea and Quercus cerris	**Annex I:** yes **Endemism:** –

Name: *Quercion pubescenti-petrae* Br.-Bl. 1932 **Description:** Peri-Alpidic basiphilous thermophilous oak forests	**Annex I:** yes priority **Endemism:** –
Name: *Ranunculion aquatilis* Passarge 1964 **Description:** Crowfoot vegetation of shallow water and margins of streams, ditches and pools	**Annex I:** – **Endemism:** –
Name: *Ranunculion fluitantis* Neuhäusl 1959 **Description:** Crowfoot and milfoil vegetation of mowing waters	**Annex I:** yes **Endemism:** –
Name: *Rhynchosporion albae* Koch 1926 **Description:** Vegetation of stagnant, acid, dystrophic waters in pools of Sphagnum bogs on deep peats	**Annex I:** yes priority **Endemism:** –
Name: *Salicion albae* Soó 1930 **Description:** Willow scrub and woodland of sub-montane and lowland river shoals and terraces	**Annex I:** yes priority **Endemism:** –
Name: *Salicion cinereae* Th. Müll. & Görs ex Passarge 1961 **Description:** Willow scrub and woodland of mires	**Annex I:** yes priority **Endemism:** –
Name: *Salicion eleagno-daphnoidis* (Moor 1958) Grass in Mucina et al. 1993 **Description:** Willow scrub of montane stream banks	**Annex I:** yes **Endemism:** –
Name: *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926 **Description:** Dwarf-willow and moss dominated communities of snow-beds on lime-poor soils and rocks	**Annex I:** yes **Endemism:** –
Name: *Salicion incanae* Aichinger 1933 **Description:** Alpine and subalpine river gravel communities	**Annex I:** yes **Endemism:** –
Name: *Salicion silesiacae* Rejmánek, Sýkora et Štursa 1971 **Description:** Subalpine tall herb-rich willow scrubs	**Annex I:** yes **Endemism:** partialy endemic
Name: *Salicion triandrae* Th. Müller et Gors. 1958 **Description:** Willow scrub of river banks below levées	**Annex I:** – **Endemism:** –
Name: *Sambuco racemosae-Salicion capreae* Tx. et Neumann in Tx. 1950 **Description:** Seral elder and willow scrub of nutrient-rich mull soils	**Annex I:** – **Endemism:** –
Name: *Sedo-Scleranthion* Br.-Bl. 1949 **Description:** Stonecrop communities of sunny slopes in the alpic valleys	**Annex I:** yes **Endemism:** –
Name: *Senecion fluviatilis* R.Tx. 1950 **Description:** Communities of tall herbaceous nitrophyles around eutrophic lakes and ditches	**Annex I:** yes **Endemism:** –
Name: *Seslerion tatrae* Pawłowski 1935 corr. Klika 1955 **Description:** Chionophilous calcareous alpine grasslands of the Western Carpathians	**Annex I:** yes **Endemism:** endemic
Name: *Sparganio-Glycerion fluitantis* Br.-Bl. et Sissingh in Boer 1942 **Description:** Vegetation dominated by mixtures of grasses and herbs along fresh-water streams and ditch banks	**Annex I:** – **Endemism:** –
Name: *Sphagnion cuspidati* Krajina 1933 **Description:** Peat moss- sedge communities of hollows in oligotrophic raised bogs	**Annex I:** yes priority **Endemism:** –
Name: *Sphagnion medii* Kästner et Flößner 1933 **Description:** Bogs of sub-continental and montane regions	**Annex I:** yes priority **Endemism:** –
Name: *Sphagno recurvi-Caricion canescentis* Passarge 1964 **Description:** Small-sedge oligotrophic fens at the fridges of bog complexes	**Annex I:** yes **Endemism:** –
Name: *Sphagno warnstorfiani--Tomenthypnion* Dahl 1957 **Description:** Small-sedge olig-mesotrophic fens developing over siliceous to base-rich substrates	**Annex I:** yes **Endemism:** –
Name: *Spiraeion mediae* Borhidi & Varga Z. 1998 **Description:** UA – add description and references	**Annex I:** yes priority **Endemism:** –
Name: *Stipion calamagrostis* Jenny-Lips ex Br.-Bl. et al 1952 **Description:** Thermophilous communities of calcareous screes	**Annex I:** yes priority **Endemism:** partialy endemic
Name: *Thero-Airion* Tx. ex Oberd. 1957 **Description:** Ephemeral vegetation of bare but stable acid sands or siliceous rocky outcrops	**Annex I:** – **Endemism:** –
Name: *Tilio-Acerion* Klika 1955 **Description:** Sub-montane maple and lime woods on steep slopes with a mild and humid mesoclimate	**Annex I:** yes priority **Endemism:** –
Name: *Trifolion medii* Th. Müller 1962 **Description:** Fringe communities of central European mesophilous forests	**Annex I:** – **Endemism:** –
Name: *Trisetion fusci* Krajina 1933 **Description:** Tall grass communities on alluviums of mountain torrents	**Annex I:** yes **Endemism:** –
Name: *Utricularion vulgaris* Passarge 1964 **Description:** Free-floating vegetation with *Utricularia australis* and *U. vulgaris*	**Annex I:** yes **Endemism:** –
Name: *Vaccinion* Böcher 1943 **Description:**Growts of bluberries on shallow skeletal soils in mountain to subalpine zone	**Annex I:** – **Endemism:** –
Name: *Vaccinion myrtilli* Krajina 1933 **Description:** Subalpine, acidophilous, mesophilous dwarf shrub heaths of Western Carpathians and High Sudetes	**Annex I:** yes **Endemism:** –
Name: *Violion caninae* Schwickerath 1944 **Description:** Unfertilised mat-grass pastures at lower altitudes	**Annex I:** yes priority **Endemism:** -

5.2 List of animal species

Group	Taxon name	Annex II	Endemism	Ecological group
amphibians	*Bombina bombina*	yes	–	wetland
amphibians	*Bombina variegata*	yes	–	forest
amphibians	*Hyla arborea*	–	–	wetland
amphibians	*Rana arvalis*	–	–	wetland
amphibians	*Triturus alpestris*	–	–	forest
amphibians	*Triturus cristatus*	yes	–	water
amphibians	*Triturus dobrogicus*	yes	–	wetland
amphibians	*Triturus montandoni*	yes	yes	wetland
birds	*Aegolius funereus*	–	–	forest
birds	*Anthus spinoletta*	–	–	alpine
birds	*Aquila chrysaetos*	–	–	forest
birds	*Aquila heliaca*	–	–	forest
birds	*Aquila pomarina*	–	–	forest
birds	*Bonasa bonasia*	–	–	forest
birds	*Bubo bubo*	–	–	forest
birds	*Caprimulgus europaeus*	–	–	forest
birds	*Ciconia nigra*	–	–	forest
birds	*Crex crex*	–	–	non forest
birds	*Dendrocopos leucotos*	–	–	forest
birds	*Emberiza cia*	–	–	non forest
birds	*Falco peregrinus*	–	–	forest
birds	*Glaucidium passerinum*	–	–	forest
birds	*Hieraaetus pennatus*	–	–	forest
birds	*Lanius minor*	–	–	non forest
birds	*Luscinia svecica svecica*	–	–	alpine
birds	*Monticola saxatilis*	–	–	non forest
birds	*Prunella collaris*	–	–	alpine
birds	*Scolopax rusticola*	–	–	forest
birds	*Strix uralensis*	–	–	forest
birds	*Tetrao tetrix*	–	–	non forest
birds	*Tetrao urogallus*	–	–	forest
birds	*Tichodroma muraria*	–	–	non forest
birds	*Upupa epops*	–	–	non forest
fish	*Alburniodes bipunctatus*	–	–	water
fish	*Aspius aspius*	yes	–	water
fish	*Barbus meridionalis*	yes	–	water
fish	*Cobitis taenia*	yes	–	water
fish	*Cottus gobio*	yes	–	water
fish	*Eudontomyzon danfordi*	yes	yes	water
fish	*Eudontomyzon mariae*	yes	–	water
fish	*Gobio albipinnatus*	yes	–	water
fish	*Gobio kessleri*	yes	–	water
fish	*Gobio uranoscopus*	yes	–	water
fish	*Gymnocephalus baloni*	yes	–	water
fish	*Gymnocephalus schraetzer*	yes	–	water
fish	*Hucho hucho*	yes	–	water
fish	*Lampetra planeri*	yes	–	water
fish	*Misgurnus fossilis*	yes	–	water

Group	Taxon name	Annex II	Endemism	Ecological group
fish	*Pelecus cultratus*	yes	–	water
fish	*Rhodeus sericeus amarus*	yes	–	water
fish	*Sabanejewia aurata*	yes	–	water
fish	*Sabanejewia balcanica*	–	–	water
fish	*Thymallus thymallus*	–	–	water
fish	*Zingel streber*	yes	–	water
fish	*Zingel zingel*	yes	–	water
invertebrates	*Abax schueppeli rendschmidtii*	–	yes	forest
invertebrates	*Acalles petryszaki*	–	yes	forest
invertebrates	*Acerentomon carpaticum*	–	yes	forest
invertebrates	*Acerentomon oreophilon*	–	yes	non forest
invertebrates	*Acrophylax vernalis* (syn. *Acrophylax sowai*)	–	yes	water
invertebrates	*Alopia bielzii clathrata*	–	yes	non forest
invertebrates	*Alzoniella slovenica*	–	yes	wetland
invertebrates	*Annitella chomiacensis*	–	yes	water
invertebrates	*Apatania carpathica*	–	yes	water
invertebrates	*Asiorestia (Neocrepidodera) transilvanica*	–	yes	non forest
invertebrates	*Athous mollis*	–	yes	non forest
invertebrates	*Austropotamobius torrentium*	yes priority	–	water
invertebrates	*Bergenstammia slovaca*	–	yes	water
invertebrates	*Bielzia coerulans*	–	yes	forest
invertebrates	*Bolbelasmus unicornis*	yes	–	non forest
invertebrates	*Bombus pyrenaeus*	–	–	alpine
invertebrates	*Boros schneideri*	yes	–	forest
invertebrates	*Branchinecta paludosa*	–	–	alpine
invertebrates	*Callimorpha (Euplagia, Panaxia) quadripunctaria*	yes priority	–	non forest
invertebrates	*Carabus fabricii*	–	–	alpine
invertebrates	*Carabus hungaricus*	yes	–	non forest
invertebrates	*Carabus obsoletus*	–	yes	forest
invertebrates	*Carabus variolosus*	yes	–	water
invertebrates	*Carabus zawadszkii*	yes	–	forest
invertebrates	*Carilia (Pseudogaurotina) excellens*	yes priority	yes	forest
invertebrates	*Carpathica calophana*	–	yes	forest
invertebrates	*Carpathobyrrhulus tatricus*	–	yes	alpine
invertebrates	*Catops ventricosus rotundatus*	–	yes	alpine
invertebrates	*Catopta thrips*	yes	–	non forest
invertebrates	*Cerambyx cerdo*	yes	–	forest
invertebrates	*Chaetopteryx polonica*	–	yes	water
invertebrates	*Chilostoma (Faustina) rossmaessleri*	–	–	alpine
invertebrates	*Chilostoma cingulellum* (syn. *Faustina cingulella*)	–	yes	alpine
invertebrates	*Chondrina tatrica*	–	yes	non forest
invertebrates	*Chrysolina globipennis*	–	yes	forest
invertebrates	*Chthonius heterodactylus*	–	yes	forest
invertebrates	*Clubiona alpicola*	–	–	alpine
invertebrates	*Cochlodina fimbriata remota*	–	yes	forest
invertebrates	*Coenagrion ornatum*	yes	–	water
invertebrates	*Coenonympha tullia*	–	–	wetland
invertebrates	*Colias myrmidone*	yes	–	non forest
invertebrates	*Cordulegaster boltonii*	–	–	water
invertebrates	*Cordulegaster heros*	yes	–	water

Group	Taxon name	Annex II	Endemism	Ecological group
invertebrates	*Cucujus cinnaberinus*	yes	–	forest
invertebrates	*Dasumia carpatica*	–	yes	forest
invertebrates	*Deltomerus carpathicus*	–	yes	alpine
invertebrates	*Deroceras moldavicum*	–	yes	wetland
invertebrates	*Deroceras praecox*	–	yes	forest
invertebrates	*Deutonura stachi*	–	–	forest
invertebrates	*Dioszeghyana schmidtii*	yes	–	forest
invertebrates	*Donus (Neoglanis) oxalidis*	–	–	wetland
invertebrates	*Dorytomus carpathicus*	–	yes	forest
invertebrates	*Drusus carpathicus*	–	yes	water
invertebrates	*Duvalius gebhardti*	yes	–	undergroud habitats
invertebrates	*Duvalius hungaricus*	yes	–	undergroud habitats
invertebrates	*Duvalius subterraneus*	–	yes	undergroud habitats
invertebrates	*Dytiscus latissimus*	yes	–	water
invertebrates	*Ecdyonurus carpathicus*	–	yes	water
invertebrates	*Erannis ankeraria*	yes	–	forest
invertebrates	*Eriogaster catax*	yes	–	non forest
invertebrates	*Euophrys (Talavera) monticola*	–	–	alpine
invertebrates	*Euphydryas (Eurodryas, Hypodryas) aurinia*	yes	–	wetland
invertebrates	*Evanystes infirmus*	–	yes	alpine
invertebrates	*Fitzingeria platyura*	–	–	forest
invertebrates	*Friesea handschini*	–	–	forest
invertebrates	*Glomeris mnischechi*	–	yes	forest
invertebrates	*Gortyna borelii lunata*	yes	–	non forest
invertebrates	*Helix lutescens*	–	–	non forest
invertebrates	*Heteraphorura carpatica*	–	yes	forest
invertebrates	*Hyloniscus mariae*	–	yes	forest
invertebrates	*Hypera carinicollis septentrionis/septentrionalis*	–	yes	non forest
invertebrates	*Hypodryas maturna*	yes	–	forest
invertebrates	*Hypogastrura tatrica*	–	yes	alpine
invertebrates	*Isophya costata*	yes	–	non forest
invertebrates	*Isophya stysi*	yes	–	non forest
invertebrates	*Lathrobium taxi*	–	yes	forest
invertebrates	*Leistus montanus pawlowskii*	–	yes	alpine
invertebrates	*Leptidea morsei*	yes	–	forest
invertebrates	*Leucorrhinia pectoralis*	yes	–	wetland
invertebrates	*Libelloides macaronius*	–	–	non forest
invertebrates	*Limoniscus violaceus*	yes	–	forest
invertebrates	*Liophloeus gibbus*	–	yes	water
invertebrates	*Liophloeus liptoviensis*	–	yes	non forest
invertebrates	*Lithobius biunguiculatus*	–	yes	forest
invertebrates	*Lobrathium sodale distinctiventre* (syn. *Platydomene sodalis distinctiventris*)	–	yes	water
invertebrates	*Lucanus cervus*	yes	–	forest
invertebrates	*Lycaena dispar*	yes	–	non forest
invertebrates	*Lycaena helle*	yes	–	wetland
invertebrates	*Maculinea alcon*	–	–	non forest
invertebrates	*Maculinea arion*	–	–	non forest
invertebrates	*Maculinea nausithous*	yes	–	non forest
invertebrates	*Maculinea teleius*	yes	–	non forest
invertebrates	*Mantis religiosa*	–	–	non forest

Group	Taxon name	Annex II	Endemism	Ecological group
invertebrates	*Morimus funereus*	yes	–	forest
invertebrates	*Morulina verrucosa*	–	yes	forest
invertebrates	*Mundochtonius carpaticus*	–	yes	forest
invertebrates	*Neanura pseudoparva*	–	yes	forest
invertebrates	*Nebria fuscipes*	–	yes	forest
invertebrates	*Nemoura babiagorensis*	–	yes	water
invertebrates	*Neobisium carpaticum*	–	yes	forest
invertebrates	*Neobisium polonicum*	–	yes	forest
invertebrates	*Nymphalis vaualbum*	yes priority	–	forest
invertebrates	*Ochthephilus rivularis*	–	yes	forest
invertebrates	*Ocypus biharicus*	–	yes	forest
invertebrates	*Ophiogomphus cecilia*	yes	–	water
invertebrates	*Orchesella disjuncta*	–	yes	forest
invertebrates	*Orthonychiurus rectopapillatus*	–	yes	forest
invertebrates	*Osmoderma eremita*	yes priority	–	forest
invertebrates	*Othius transsilvanicus*	–	yes	forest
invertebrates	*Otiorhynchus kollari*	–	yes	forest
invertebrates	*Otiorhynchus obtusus*	–	yes	alpine
invertebrates	*Otiorhynchus proximus*	–	yes	alpine
invertebrates	*Oxychilus orientalis* (syn. *Oxychilus deubeli*, *Cellariopsis deubeli*)	–	yes	forest
invertebrates	*Paederus* (*Paederidus*) *rubrothoracicus carpathicola*	–	yes	water
invertebrates	*Paracaloptenus caloptenoides*	yes	–	non forest
invertebrates	*Paranemastoma kochi*	–	yes	forest
invertebrates	*Parnassius apollo*	–	–	non forest
invertebrates	*Parnassius mnemosyne*	–	–	forest
invertebrates	*Pholidoptera transsylvanica*	yes	–	forest
invertebrates	*Phryganophilus ruficollis*	yes priority	–	forest
invertebrates	*Plicuteria lubomirskii*	–	yes	non forest
invertebrates	*Plutomurus carpaticus*	–	yes	forest
invertebrates	*Potamophylax carpathicus*	–	yes	water
invertebrates	*Probaticus subrugosus*	yes	–	non forest
invertebrates	*Pseudanophthalmus pilosellus* (syn. *Duvaliopsis pilosella*) *poloninensis*	–	yes	alpine
invertebrates	*Pseudanophthalmus pilosellus* (syn. *Duvaliopsis pilosella*)	–	yes	alpine
invertebrates	*Pseudopodisma nagyi*	–	yes	non forest
invertebrates	*Pterostichus foveolatus*	–	yes	forest
invertebrates	*Pterostichus pilosus*	–	yes	forest
invertebrates	*Pterostichus tatricus*	–	yes	alpine
invertebrates	*Rhithrogena gorganica*	–	yes	water
invertebrates	*Rhithrogena wolosatkae*	–	yes	water
invertebrates	*Rhysodes sulcatus*	yes	–	forest
invertebrates	*Rosalia alpina*	yes priority	–	forest
invertebrates	*Sadleriana pannonica*	–	yes	wetland
invertebrates	*Sclerophaedon carpathicus*	–	yes	forest
invertebrates	*Silpha atrata carpathica*	–	yes	forest
invertebrates	*Sipalia* (*Leptusa*) *carpathica*	–	yes	forest
invertebrates	*Sipalia* (*Leptusa*) *koronensis*	–	yes	non forest
invertebrates	*Siro carpathicus*	–	–	forest
invertebrates	*Spelaeodiscus tatricus*	–	yes	alpine
invertebrates	*Stenobothrus* (*Stenobothrodes*) *eurasius*	yes	–	non forest

Group	Taxon name	Annex II	Endemism	Ecological group
invertebrates	*Stenus carpathicus*	–	yes	forest
invertebrates	*Stenus obscuripes*	–	yes	non forest
invertebrates	*Stenus transsilvanicus*	–	yes	alpine
invertebrates	*Stenus vastus*	–	–	forest
invertebrates	*Thaumalea vaillanti*	–	yes	alpine
invertebrates	*Theodoxus transversalis*	yes	–	water
invertebrates	*Tibicina haematodes*	–	–	non forest
invertebrates	*Trechus latus*	–	subendemic?	wetland
invertebrates	*Trechus striatulus*	–	yes	alpine
invertebrates	*Trichia (Petasina) bielzi*	–	yes	forest
invertebrates	*Trichia (Petasina) unidentata carpathica*	–	yes	forest
invertebrates	*Trichodrilus tatrensis*	–	yes	water
invertebrates	*Triplax carpathica*	–	yes	forest
invertebrates	*Tubifex montanus*	–	yes	water
invertebrates	*Unio crassus*	yes	–	water
invertebrates	*Vertigo angustior*	yes	–	wetland
invertebrates	*Vertigo geyeri*	yes	–	wetland
invertebrates	*Vertigo moulinsiana*	yes	–	wetland
invertebrates	*Vestia elata*	–	yes	forest
invertebrates	*Vestia gulo*	–	yes	forest
invertebrates	*Vestia ranojevici moravica*	–	yes	forest
invertebrates	*Vestia turgida*	–	yes	forest
invertebrates	*Xantholinus azuganus*	–	yes	non forest
invertebrates	*Zercon carpathicus*	–	yes	forest
reptiles	*Elaphe longissima*	–	–	forest
reptiles	*Emys orbicularis*	yes	–	wetland
reptiles	*Lacerta viridis*	–	–	non forest
reptiles	*Vipera berus*	–	–	non forest
mammals	*Barbastella barbastellus*	yes	–	forest
mammals	*Bison bonasus*	yes priority	–	forest
mammals	*Canis lupus*	yes priority	–	forest
mammals	*Castor fiber*	yes	–	water
mammals	*Felis sylvestris*	–	–	forest
mammals	*Lutra lutra*	yes	–	water
mammals	*Lynx lynx*	yes	–	forest
mammals	*Marmota marmota*	yes priority	subsp. latirostris	alpine
mammals	*Microtus (Pitymys) tatricus*	yes	yes	alpine
mammals	*Miniopterus schreibersi*	yes	–	forest
mammals	*Myotis bechsteini*	yes	–	forest
mammals	*Myotis blythii*	yes	–	forest
mammals	*Myotis dasycneme*	yes	–	water
mammals	*Myotis emarginatus*	yes	–	forest
mammals	*Myotis myotis*	yes	–	forest
mammals	*Nyctalus leisleri*	–	–	forest
mammals	*Rhinolophus euryale*	yes	–	forest
mammals	*Rhinolophus ferrumequinum*	yes	–	forest
mammals	*Rhinolophus hipposideros*	yes	–	forest
mammals	*Rupicapra rupicapra*	yes priority	subsp. tatrica	alpine
mammals	*Sorex alpinus*	–	–	forest
mammals	*Spermophilus (Citellus) citellus*	yes	–	non forest
mammals	*Ursus arctos*	yes priority	–	forest

5.3 List of plant species

Taxon name	Annex II	Endemism
Aconitum bucovinense Zapał.	–	Eastern and Southern Carpatnian endemic
Aconitum degenii Gáyer subsp. *degenii*	–	Eastern and Southern Carpatnian endemic
Aconitum firmum Rchb. subsp. *firmum*	–	Western Carpathian endemic
Aconitum firmum subsp. *maninense* (Skalický) Starmühl.	–	Western Carpathian endemic
Aconitum firmum subsp. *moravicum* Skalický	yes	Western Carpathian endemic
Aconitum lasiocarpum (Rchb.) Gáyer	–	Eastern Carpathian endemic
Aconitum moldavicum Hacq.	–	Carpathian endemic
Aconitum moldavicum subsp. *hosteanum* (Schur) Asch. et Graebn.	–	Eastern and Southern Carpathian endemic
Aconitum nanum (Baumg.) Simonk.	–	Eastern Carpathian endemic
Adenophora liliifolia (L.) Ledeb. ex A. DC.	yes	–
Agrimonia pilosa Ledeb.	yes	–
Alyssum montanum subsp. *brymii* (Dostál) Soó	–	Western Carpathian endemic
Antennaria carpatica (Wahlenb.) Bluff et Fingerh. subsp. *carpatica*	–	Carpathian endemic
Arenaria tenella Kit.	–	Endemic of Tatry Mts.
Asplenium adulterinum Milde	yes	–
Bromus monocladus Domin	–	Western Carpathian subendemic
Bupleurum dilatatum (Schur) Baksay	–	Carpathian subendemit
Buxbaumia viridis (Moug.) Moug. & Nestl. (o)	yes	–
Campanula glomerata subsp. *subcapitata* (Popov) Fed.	–	Eastern Carpathian endemic
Campanula carpatica Jacq.	–	Carpathian endemic
Campanula serrata (Kit.) Hendrych	yes priority	Carpathian endemic
Campanula tatrae Borbás	–	Western Carpathian endemic
Campanula xylocarpa Kovanda	–	Western Carpathian endemic (Matra – preCarpathian endemic)
Cardaminopsis halleri subsp. *tatrica* (Pawł.) Dostál ex Měsíček	–	Western Carpathian endemic
Cardaminopsis neglecta (Schultes) Hayek	–	Carpathian endemic
Carduus lobulatus Borbás	–	Western Carpathian endemic
Carex sempervirens subsp. *tatrorum* (Zapał.) Pawł.	–	Western Carpathian endemic
Cerastium glandulosum (Kit.) Ják	–	Subendemit of Tatry Mts.
Chrysanthemum zawadskii Herbich	–	Endemic of Pieniny Mts.
Cirsium brachycephalum Jur.	yes	–
Cochlearia tatrae Borbás	yes	Endemic of Tatry Mts.
Colchicum arenarium Waldst. et Kit.	yes	–
Crambe tataria Sebeok	yes	–
Crocus discolor G. Reuss	–	Western Carpathian endemic
Cyanus montanus subsp. *mollis* (Waldst. et Kit.) Soják	–	Carpathian subendemic
Cyanus triumfettii subsp. *dominii* (Dostál) Dostál	–	Western Carpathian endemic
Cyclamen fatrense Halda et Soják	yes	Subendemic of Veľká Fatra Mts.
Cypripedium calceolus L.	yes	–
Daphne arbuscula Čelak.	yes priority	Endemic of Muránska Planina Mts., Paleoendemic
Delphinium nacladense Zapał.	–	Eastern Carpathian endemic
Delphinium oxysepalum Borbás et Pax	–	Western Carpathian endemic, Paleoendemic
Dentaria glandulosa Waldst. et Kit. ex Willd.	–	Carpathian subendemic
Dianthus carthusianorum subsp. *saxigenus* (Schur) Ják.	–	Eastern Carpathian endemic
Dianthus nitidus Waldst. et Kit. subsp. *nitidus*	yes	Western Carpathian endemic, Paleoendemic
Dianthus praecox Kit. subsp. *praecox*	–	Western Carpathian endemic

Taxon name	Annex II	Endemism
Dianthus praecox subsp. *lumnitzeri* (Wiesb.) Kmeťová	yes	Western Carpathian subendemic
Dianthus praecox subsp. *pseudopraecox* (Novák) Kmeťová	–	Endemic of Matra mountains (Slovenský kras and Bükk)
Dicranum viride (Sull. & Lesq.) Lindb. (o)	yes	–
Draba lasiocarpa subsp. *klasterskyi* (Chrtek) Chrtek	–	Endemic of Slovenský Kras Mts.
Dracocephalum austriacum L.	yes	–
Drepanocladus vernicosus (Mitt.) Warnst. (o)	yes	–
Echium russicum J. F. Gmelin	yes	–
Eleocharis carniolica W.D.J. Koch	yes	–
Erigeron hungaricus (Vierh.) Pawł.	–	Carpathian endemic
Erysimum pallidiflorum Szépl. ex Jáv.	–	Matra–preCarpathian endemic
Erysimum pieninicum Pawł.	yes priority	Endemic of Polish part of Pieniny mountains
Erysimum wahlenbergii (Asch. et Engl.) Borbás	–	Endemic of central mountains of Western Carpathians
Erysimum witmannii Zaw.	–	Carpathian endemic
Euphrasia exaristata Smejkal	–	Endemic of Tatry Mts.
Euphrasia slovaca (Yeo) Holub	–	Carpathian endemic
Euphrasia stipitata Smejkal	–	Endemic of Krivánska Fatra Mts.
Euphrasia tatrae Wettst.	–	Carpathian endemic
Ferula sadleriana Ledeb.	yes priority	–
Festuca pseudolaxa Schur	–	Carpathian endemic
Festuca saxatilis Schur	–	Eastern and Southern Carpathian endemic
Festuca tatrae (Czakó) Degen	–	Western and Southern Carpathian endemic
Festuca versicolor Tausch subsp. *versicolor*	–	Carpathian subendemic
Galium abaujense Borbás	–	Western Carpathian endemic (Matra – preCarpathian subendemic)
Gentianella amarella subsp. *reussii* (Tocl) Holub	–	Endemic of central mountains of Western Carpathians
Gentianella fatrae (Borbás) Holub	–	Western Carpathian endemic
Gentianella lutescens subsp. *tatrae* (Ronniger) Holub	–	Western Carpathians endemic
Gladiolus palustris Gaud.	yes	–
Hesperis vrabelyiana (Schur) Borbás	–	Endemic of the Bükk Mts.
Hesperis slovaca (F. Dvořák) F. Dvořák	–	Endemic of Nízke Tatry Mts.
Hieracium carpathicum Besser subsp. *carpathicum*	–	Western Carpathians endemic
Hieracium crassipedipilum (Pawl. et Zahn) Chrtek f.	–	Endemic of Central mountains of Western Carpathians
Hieracium melananthum (Naegeli et Peter) P. D. Sell et C. West	–	Western Carpathians endemic
Hieracium pinetophilum (Degen et Zahn) Chrtek f.	–	Endemic of Tatry Mts.
Himantoglossum caprinum (M. Bieb.) Spreng.	yes	–
Hylotelephium argutum (Haw.) Holub	–	Carpathian endemic
Iris humilis subsp. *arenaria* (Waldst. et Kit.) Á. et D. Löve	yes	–
Iris hungarica Waldst. et. Kit.	yes	–
Jovibarba globifera subsp. *preissiana* (Domin) Holub	–	Western and Eastern Carpathian endemic
Knautia kitaibelii (Schultes) Borbás	–	Western Carpathian subendemic
Knautia slovaca Štepánek	–	Western Carpathian endemic
Koeleria tristis Domin	–	Western Carpathian endemic
Lathyrus transsilvanicus (Spreng.) Fritsch	–	Carpathian subendemic
Leontodon pseudotaraxaci Schur	–	Carpathian endemic
Leucanthemopsis alpina subsp. *tatrae* (Vierh.) J. Holub	–	Endemic of Tatry Mts.
Leucanthemum waldsteinii (Sch. Bip.) Pouzar	–	Carpathian subendemic
Leucojum vernum subsp. *carpaticum* (Spring) O. Schwarz	–	Eastern Carpathian subendemic
Ligularia sibirica (L.) Cass.	yes	–
Linum extraaxillare Kit.	–	Carpathian subendemic

Taxon name	Annex II	Endemism
Liparis loeselii (L.) Rich.	yes	–
Luzula alpinopilosa subsp. *obscura* Fröhner	–	Carpathian endemic
Meesia longiseta Hedw. (o)	yes	–
Melampyrum herbichii Woł.	–	Eastern and Southern Carpathian endemic
Melampyrum saxosum Baumg.	–	Eastern Carpathian endemic
Minuartia pauciflora (Kit. ex Kanitz) Dvořáková	–	Carpathian endemic
Onosma tornensis Jáv.	yes priority	Endemic of Slovensky Kras Mts.
Ophrys holubyana Andras.	–	Western Carpathian subendemic
Oxytropis campestris (L.) DC. subsp. *tatrae* (Borbás) Dostál	–	Carpathian endemic
Oxytropis carpatica Uechtr.	–	Carpathian endemic
Papaver tatricum (A. Nyár.) Ehrend. subsp. *tatricum*	–	Endemic of Tatry Mts.
Papaver tatricum subsp. *fatraemagnae* Bernátová	–	Endemic of Veľká Fatra Mts.
Pilosella ullepitschii (Blocki) Szelag	–	Carpathian endemic
Plantago atrata Hoppe subsp. *carpathica* (Soó) Soó	–	Carpathian endemic
Poa babiogorensis Bernátová, Májovský et Obuch	–	Endemic of Babia Góra Mts.
Poa carpatica (V. Jirásek) Chopyk subsp. *carpatica*	–	Western and Eastern Carpathian endemic
Poa carpatica subsp. *supramontana* Bernátová, Májovský, Kliment et Topercer	–	Endemic of Central mountains of Western Carpathians
Poa granitica Braun-Blanq.	–	Endemic of Tatry Mts.
Poa margilicola Bernátová et Májovský	–	Endemic of Veľká Fatra Mts.
Poa nobilis Skalińska	–	Endemic of High Tatry Mts.
Poa pannonica subsp. *scabra* (Asch. et Graebn.) Soó	–	Carpathian subendemic
Poa sejuncta Bernátová, Májovský et Obuch	–	Endemic of Osobitá Mts.
Primula auricula subsp. *hungarica* (Borbás) Soó	–	Western Carpathian subendemic
Primula elatior subsp. *poloninensis* (Domin) Dostál	–	Eastern and Southern Carpathian endemic
Pulsatilla grandis Wenderoth	yes	–
Pulsatilla patens (L.) Miller	yes	–
Pulsatilla slavica G. Reuss	–	Western Carpathian endemic
Pulsatilla subslavica Futák ex Goliašová	yes priority	Western Carpathian endemic
Pyrola carpatica Holub et Křísa	–	Carpathian endemic
Ranunculus altitatrensis Paclová et Murín	–	Endemic of High Tatry Mts.
Ranunculus carpaticus Herbich	–	Eastern and Southern Carpathian endemic
Ranunculus pseudomontanus Schur	–	Carpathian subendemic
Rumex arifolius subsp. *carpaticus* (Zapał.) Pawł.	–	Eastern and Southern Carpathian endemic
Salix kitaibeliana Willd.	–	Carpathian endemic
Saxifraga hirculus L.	yes	–
Saxifraga moschata subsp. *dominii* Soó emend. Pawłowska	–	Endemic of Central Mountains of Western Carpathians
Saxifraga moschata subsp. *kotulae* Pawłowska	–	Endemic of Tatry Mts.
Saxifraga wahlenbergii Ball	–	Western Carpathian endemic, Paleoendemic
Scabiosa columbaria subsp. *pseudobanatica* (Schur) Jav. et Csapody	–	Carpathian subendemic
Scilla kladnii Schur	–	Carpathian subendemic
Sempervivum carpathicum subsp. *heterophyllum* (Hazsl.) Letz	–	Western Carpathian endemic
Sempervivum carpathicum Wettst. ex Prodan subsp. *carpathicum*	–	Carpathian endemic
Senecio ucranicus Hodálová	–	Eastern Carpathian
Serratula lycopifolia (Vill.) A. Kern	yes priority	–
Sesleria heufleriana Schur	–	Carpathian subendemic
Sesleria tatrae (Degen) Deyl	–	Western Carpathian subendemic
Silene donetzica subsp. *sillingeri* (Hendrych) Šourková	–	Matra–preCarpathian endemic
Silene nutans subsp. *dubia* (Herbich) Zapał.	–	Eastern and Southern Carpathian endemic

Taxon name	Annex II	Endemism
Soldanella carpatica Vierh.	–	Western Carpathian endemic
Soldanella hungarica Simonk. subsp. *hungarica*	–	Carpathian endemic
Soldanella hungarica subsp. *major* (Neilr.) Pawłowska	–	Carpathian subendemic
Soldanella pseudomontana F. K. Mey.	–	Carpathian endemic
Sorbus hazslinszkyana (Soó) Májovský	–	Matra–preCarpathian endemic
Sorbus margittaiana (Jáv.) Kárpáti	–	Endemic of Krivánska Fatra Mts.
Sorbus pekarovae Májovský et Bernátová	–	Endemic of Veľká Fatra Mts.
Sorbus scepusiensis Kovanda	–	Endemic of Volovské vrchy Mts.
Symphytum cordatum Waldst. et Kit.	–	Carpathian subendemic
Taraxacum erythrocarpum Kirschner et Štěpánek	–	Western Carpathian endemic
Taraxacum nigricans (Kit.) Rchb.	–	Western Carpathian endemic
Taraxacum pawłowskii Soest	–	Endemic of Tatry Mts.
Taraxacum pieninicum Pawł.	–	Endemic of Polish part of Pieniny Mts.
Tephroseris longifolia subsp. *moravica* J. Holub	yes	Western Carpathian endemic
Thalictrum minus subsp. *carpaticum* (B. Kotula) Osvač.	–	Endemic of Tatry Mts.
Thlaspi caerulescens subsp. *tatrense* (Zapał.) Dvořáková	–	Western Carpathian endemic
Thlaspi jankae A. Kern	yes	Matra–preCarpathian endemic
Thymus alternans Klokov	–	Eastern Carpathian subendemic
Thymus pulcherrimus Schur subsp. *pulcherrimus*	–	Carpathian endemic
Thymus pulcherrimus subsp. *sudeticus* (Lyka) P. A. Schmidt	–	Western Carpathian subendemic
Tithymalus sojakii (Chrtek et Křísa) Holub	–	Eastern Carpathian endemic
Tozzia carpathica Woł.	yes	–
Trifolium orbelicum subsp. *monticolum* (Domin) Májovský	–	Subendemic of Tatry Mts.
Trifolium pratense subsp. *kotulae* (Pawł.) Soják	–	Carpathian endemic
Trifolium sarosiense Hazsl.	–	Carpathian subendemic
Trisetum flavescens subsp. *tatricum* Chrtek	–	Carpathian endemic
Trisetum fuscum (Kit. ex Schult.) Schult.	–	Carpathian endemic

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