Snake Trail / Železná Ruda

1 Welcome to the Snake Trail

Length of Path 4,6 km

Welcome to the Snake Trail

As much as the name might suggest that it is about snakes, that is not the case. This educational trail sets out to inform the visitor about local nature. The only snake you might, should you be lucky enough, come across here is the common European adder (Vipera berus). This very timid species, which swiftly reacts to vibrations of the ground, can be found in light and damp places, such as water-saturated meadows, the light edges of forests and peatlands. They are also fond of clearance cairns, where they can lie in the sun and easily hide between the stones. Reptiles generally are not very common in Šumava. This stems from the fact that reptiles cannot regulate their own body temperature and as such are dependent on the warmth of their surroundings. But higher temperatures can be scarce in mountainous regions, which is why there are only two other kinds of reptiles in the higher areas Šumava. Apart from the abovementioned common adder, it is the legless lizard slowworm (Anguis fragilis) and the viviparous lizard (Lacerta vivipara).

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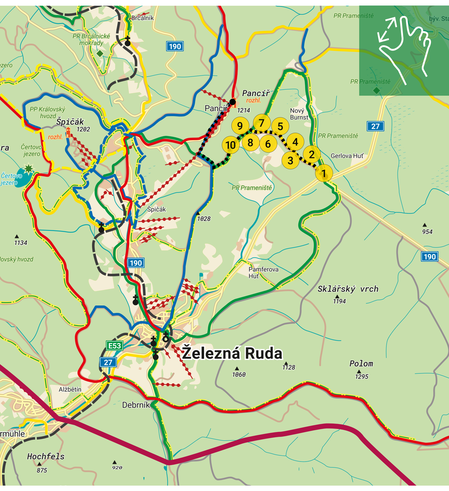

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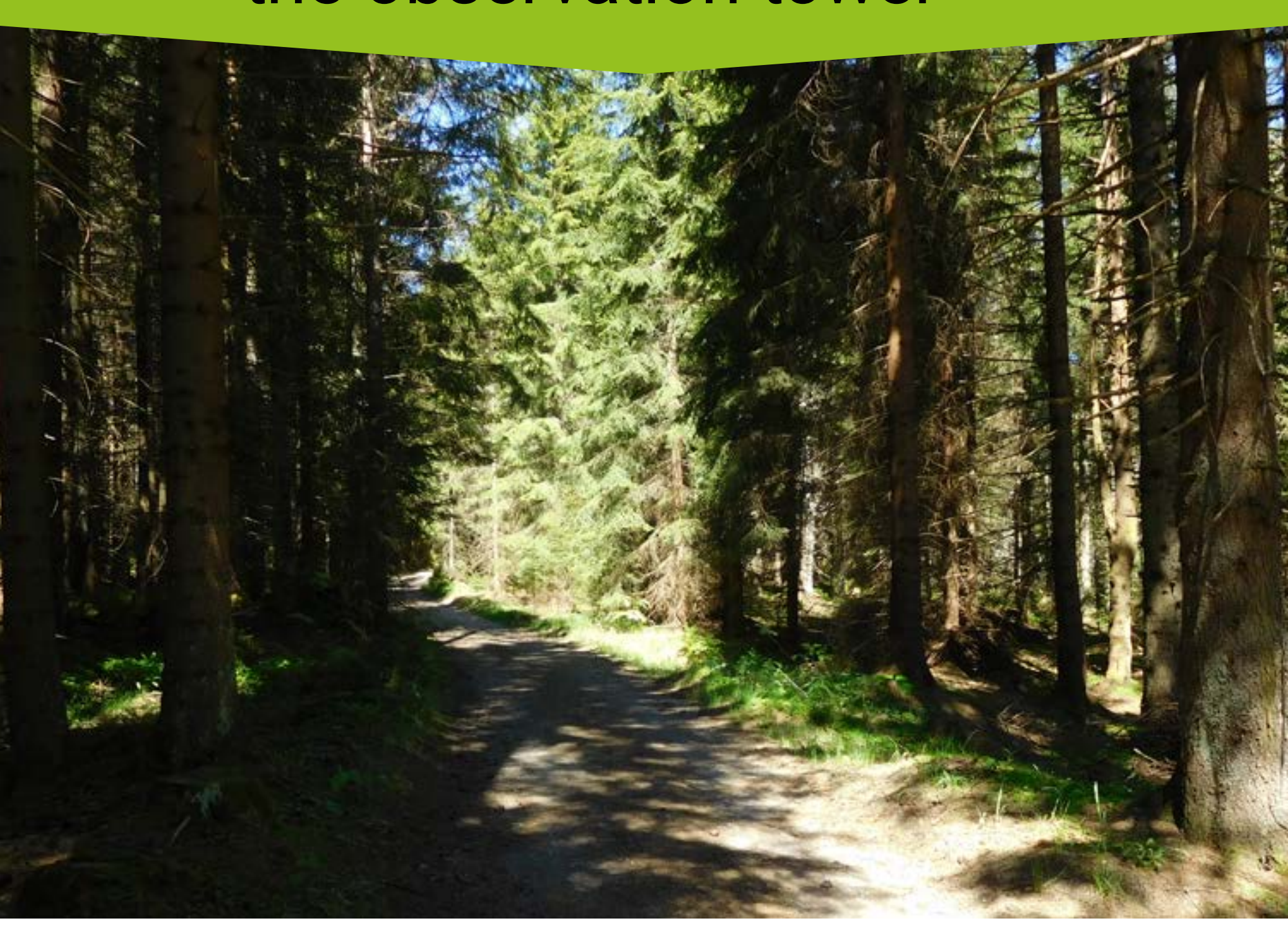
2 Paths – The cableway below the observation tower



Length of Path 4,6 km

Paths – The cableway below the observation tower

Apart from transporting people and commodities, the roads also serve as migration paths for many live organisms. The fact that animals walk on roads the same way humans do may not be surprising. However, one may pause at the discovery that plants also 'walk' on them. Of course it cannot be called a walk in the literal sense but it is nonetheless a movement. Thanks to the roads, various species of plants have been able to use their reproductive organs (mainly seeds, inflorescence, rootstocks, or other parts) to get places they would otherwise not have been able to reach. Typical species of plants which we encounter on this trail include:
annual meadow grass (Poa annua)
broadleaf plantain (Plantago major)
common self-heal (Prunella vulgaris)
red sanspurry (Spergularia rubra)
annual knawel (Scleranthus annuus)

In the middle of the forest, we can observe various species of meadows and pastures:
spotted St. Johnswort (Hypericum maculatum)
narrowleaf plantain (Plantago lanceolata)
meadow buttercup (Ranunculus acris)
common sorrel (Rumex acetosa)
dandelion (Taraxacum)
melancholy thistle (Cirsium heterophyllum)

Material used for building roads, paths, highways, railways, etc. is often imported across long distances and soil or gravel are often full of seeds. Those can begin to flourish and propagate in a new environment. Species which begin to spread to a degree that can cause environmental damage are referred to as invasive alien species. They include for example:
heath bedstraw (Galium saxatile), which was native to our northern border mountains from Ore Mountains to Giant Mountains
common foxglove (Digitalis purpurea), native to south and southwest Europe
hairy bittercress (Cardamine hirsuta), whose native origins are not clear, but in our country it only used to grow in warmer, less elevated regions.

Even rare and protected species can be found alongside this trail. They include for example some species of orchids:
greater butterfly-orchid (Platanthera chlorantha) - protected by Czech law as endangered and protected internationally under the CITES agreement
common spotted orchid (Dactylorhiza fuchsii) - protected by Czech law as endangered and protected internationally under the CITES agreement
broad-leaved helleborine (Epipactis helleborine) – not protected by Czech law, but classed by the Czech Red List of Plants as a species requiring attention and is protected internationally under the CITES agreement
Nitrogen-adapted species are a common occurrence around human settlements, nitrogen-rich agricultural land, or in human-altered forests.
The following nitrophilic species grow in the surroundings of the observation tower:
stinging nettle (Urtica dioica)
elderberry (Sambucus nigra)
common thistle (Cirsium vulgare)
common mugwort (Artemisia vulgaris)

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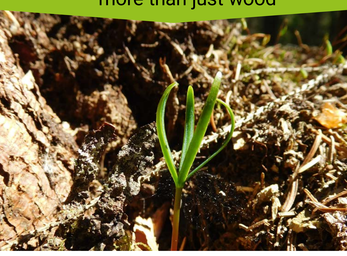
3 The woods are much more than just wood



Length of Path 4,6 km

The woods are much more than just wood

One is engulfed by the woods as soon as one steps upon this trail. This particular forest is meant primarily for logging. There is one dominant tree species, that being the Norway spruce (Picea abies). This robust conifer is indigenous to Šumava and its potential has been employed by people for a long time. The spruce wood has been and still is used in building, paper industry, furniture making, as a fuel, and in many other branches of industry. The spruce has one big advantage over other woody plants - it grows very quickly and as such is very popular with foresters. In a man-made spruce forest, we will not find a large variety of plant or animal species. Its biodiversity is significantly lower than in natural spruce forests. There are acidophilic plant species such as the European blueberry (Vaccinium myrtillus), cowberry (Vaccinium vitis-idaea), wavy hair-grass (Avenella flexuosa), wood sorrel (Oxalis acetosella), or false lily of the valley (Maianthemum bifolium), that manage to deal with the needles which take very long to decompose. Quite rarely, it is possible to see other isolated woody plants, such as the common beech, rowan, or silver fir. Animals which live in man-made spruce forests have adapted to forest environment and have no other prominent needs. They include species such as the black woodpecker, the boreal owl, the common raven, the bank vole, the common shrew, the brown long-eared bat, the northern bat, the yellow-necked mouse, the red squirrel, the European badger, the beech marten, the red fox, or the red deer.

From a botanic stance, the forests are categorised differently. In the area surrounding the Snake Trail we encounter two natural forest biotypes - waterlogged spruce groves and acidic beechwoods.

Dead wood - decaying logs, stumps, arrays of branches – is an immensely important substrate for seedlings that want to take hold. Not only do they enrich the area with nutrients, but they also provide space for them to take hold.

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4 The History of Šumava's Nature

Length of Path 4,6 km

The History of Šumava's Nature

How can a person today learn about what nature looked like a thousand years ago? On first sight, it might seem an unsolvable mystery, considering that humans have only been recording it in chronicles for barely a hundred years. In the first half of the 20th century, scientific fields, which used to fall under the field of archaeology, emerged. Those fields analyse sediments - materials which tend to accumulate mostly on the bottom of bodies of water. Currently, these fields, which together carry the name paleoecology, are highly self-sufficient and bring us valuable information from the deep past.

The basic and most important area of paleoecology in such locations is palynology.

Palynology is a science studying pollen. The principle of this science lies in the fact that pollen can, under suitable conditions, be preserved for thousands of years. Every year flowers blossom and their pollen gets into the air from wherein it eventually falls on the ground again. If it falls on a peatland, the peat absorbs it and stores it in a layer without access to air. The following year the situation repeats itself and another layer of pollen is stored in the peatland. It this development continues unimpeded and there is no oxygenation of the sediment, the polled remains in the peat, unaltered, and can eventually offer information as to what kind of plants used to grow in the area.

According to recent findings, Šumava, from 800 to 1100 meters above sea level, was dominated by spruce in the last 10 000 years. Some 12 000 years ago, Šumava was covered by semi-open pine forests, which were later replaced by hazel and when spruce appeared some 10 000 years ago it soon represented 60% of vegetation. Then, 7000 years age, beech appeared and began to represent 15 % of local vegetation and 5000 years ago it was fir which, at its peak, reached only 20 % at most. Spruce has retained the dominant position in higher areas of Šumava up to this day.

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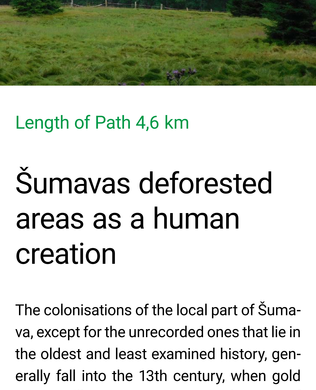
5 Šumavas deforested areas as a human creation



Length of Path 4,6 km

Šumavas deforested areas as a human creation

The colonisations of the local part of Šumava, except for the unrecorded ones that lie in the oldest and least examined history, generally fall into the 13th century, when gold mining villages were set up in the area of today's Železná Ruda

Local settlers made glass and mined and processed iron. Glass production required vast amounts of wood, which was logged from the surrounding of the glassworks. As such, deforested round areas were created around the mills and kept growing as more and more wood was used for glass production. The locals have used their environment for their benefit for generations. Meadows and pastures were created on the new deforested lands.

In this way, rings of meadows and pastures came to exist around settlements and villages. By the 19th century they looked very similar to how they do now - the plots of land are divided and fixed by clearance cairns and baulks.

Most German inhabitants were forcibly displaced after World War II. With the disappearance of settlements, traditional farming is slowly disappearing too and the deforested areas are beginning to look like the forest they once were again. This leads to a decrease in biodiversity. If we want to preserve the current biodiversity (which is what the Landscape park and the National Park strive to do), it brings a lot of problems. The end of traditional farming means great expenses on maintaining the richness of species of local biotopes. Local plant species usually easily give way to stronger herbaceous or woody plants which quickly take over the space. This process is called succession. Less demanding and sturdier kinds of forest try to take over places of fragile plant species and meadows which draw many species of butterflies and other invertebrates. In other words, these localities have to be constantly mowed, else they succumb to succession.

Depending on the type of station, which is usually given by the depth of soil and its water supply, the deforested area around Pancíř developed the following biotopes of meadows and pastures:
Mountain Nardus turf
Damp thistle meadows
Oatgrass meadows
Non-calcareous moss fens

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6 Plants without vessels – mosses

Length of Path 4,6 km

Plants without vessels – mosses

Mosses are plants that propagate through spores and have no developed vascular bundles. It is this that distinguishes them from vascular plants (spruce, maize, or bluegrass). They have a somewhat more complicated life cycle, with two switching stages - sporophyte and gametophyte. Each of which has a different number of chromosomes. Gametophyte, with half the number of chromosomes, usually dominates the life cycle. They are green plants with developed male and female reproductive organs.

Mosses are present on a number of places. On the trail, which you are currently walking, mosses grow on stones, tree trunks, and on the ground. They are relatively tightly bound to a type of substrate with a specific pH, amount of nutrients, etc. Because they do not have vascular bundles, they absorb water with their whole body and lose it very easily. They are most satisfied in wet areas, as they have a great capability of absorbing water. A typical type of moss is peat moss, which creates whole biotypes known as peat bogs. Peat moss never stops growing on the top end, while the bottom end gradually dies and creates another layer of peat. Individual species of moss and peat bog have the ability to absorb water like a sponge and as such are of great importance in water management. They hold rainwater and release it gradually.

The typically dark waters of Šumava's streams and rivers is caused by humins which form in peat bogs during the decomposition of dead organic parts of plants and cause high acidification of water.

On and nearby this trail you can encounter the following species:

peat moss (Sphagnum) - this genus numbers over 30 species in the Czech Republic and recognising them from each other is not easy, so classifying them into the genus will suffice
broom forkmoss (Dicranum scoparium) – a species growing mainly on acidic humus and often creating vast covers.
Plagiothecium undulatum - a stout species creating procumbent flat stalks
Polytrichastrum formosum - one of the most common species in the Czech Republic, creating typical pillows
red-stemmed feathermoss (Pleurozium schreberi) - species that is widely spread from lowlands to mountains, from the ground to rocks and trees
splendid feather-moss (Hylocomium splendens) – a species creating layers, which distinguishes it well from other species, it grows on forest soil and secondary biotopes (quarry)
greater whipwort (Bazzania trilobata) - mainly a mountain species, typical for waterlogged spruce forests
many-fruited thyme-moss (Plagiomnium affine) - grows in wet biotopes, its petals are oval and have large cells
large white-moss (Leucobryum glaucum) - creates typical pillows which are grey when dry, grow in drier areas, protected in Switzerland

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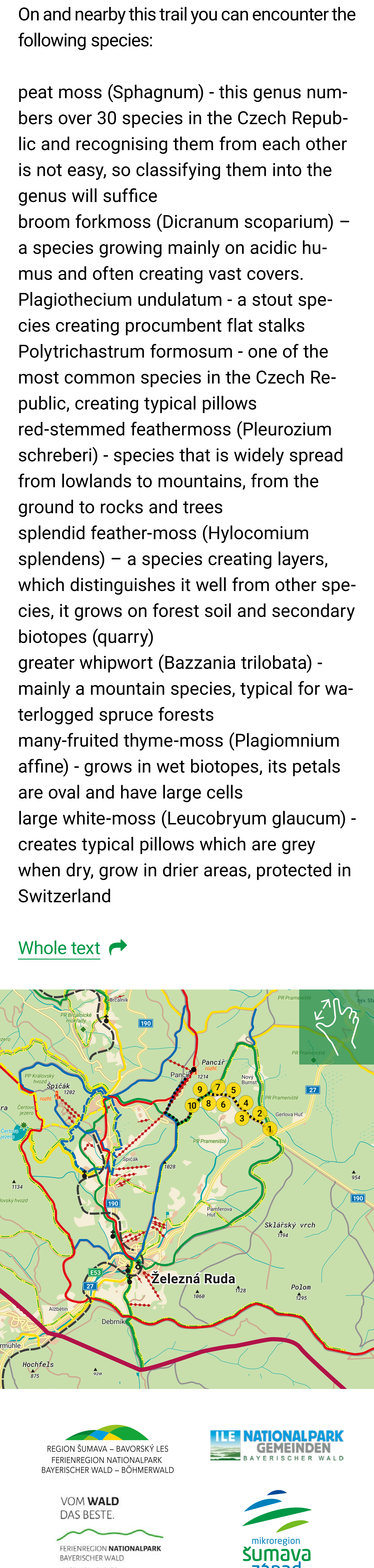

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7 Lichens – nature cannot do without them

Length of Path 4,6 km

Lichens – nature cannot do without them

Lichens exemplify a type of organism that is put together by members of two completely different kingdoms. One is a fungus and the other is a green or blue-green alga. The fungus half (or rather the more than 90% of it) tends to be an ascomycota, rarely it can also be a basidiomycota. The most common photosynthetic part of a lichen is usually an alga of the Trebouxia genus. During the course of evolution, the fungus and the alga grew so used to each other, that they cannot be without one another - they are mutually dependent. Only in certain circumstances and that is very rarely, the alga can gain independence from the fungus, for example if it is Nostoc genus of blue-green alga.

Usually, the relationship is assessed as a symbiotic - that is, mutually beneficial state. The fungus supplies inorganic matter, water, gas exchange and living space. The alga then supplies organic matter derived from photosynthesis. But the truth is that, in a way, the fungus holds the alga hostage.

Lichens are excellent air-quality indicators. In a simplified way, it can be said that the longer the thallus (body of lichen) you find, the better the air quality around you.

On the trail or in its surroundings it is possible to encounter to following species of lichen:
tube lichen (Hypogymnia physodes) - common species growing on bark of trees, with edges resembling lips
shield lichen (Parmelia sulcata) - has a squamulose thallus and grows on bark
tree moss (Pseudevernia furfuracea) - is epiphytic, meaning it grows on branches of mainly spruces and birch in higher areas
trumpet lichen (Cladonia fimbriata) - has a dimorphic thallus (ground scales and from them growing phylums), can be found on decaying wood, trees, on the ground and elsewhere
old man's beard (Usnea) - is epiphytic, grows on trees and branches, very sensitive to SO2 in the air and as such is very rare. Contains usnic acid, which helps heal injuries, and has always been gathered and used for that end

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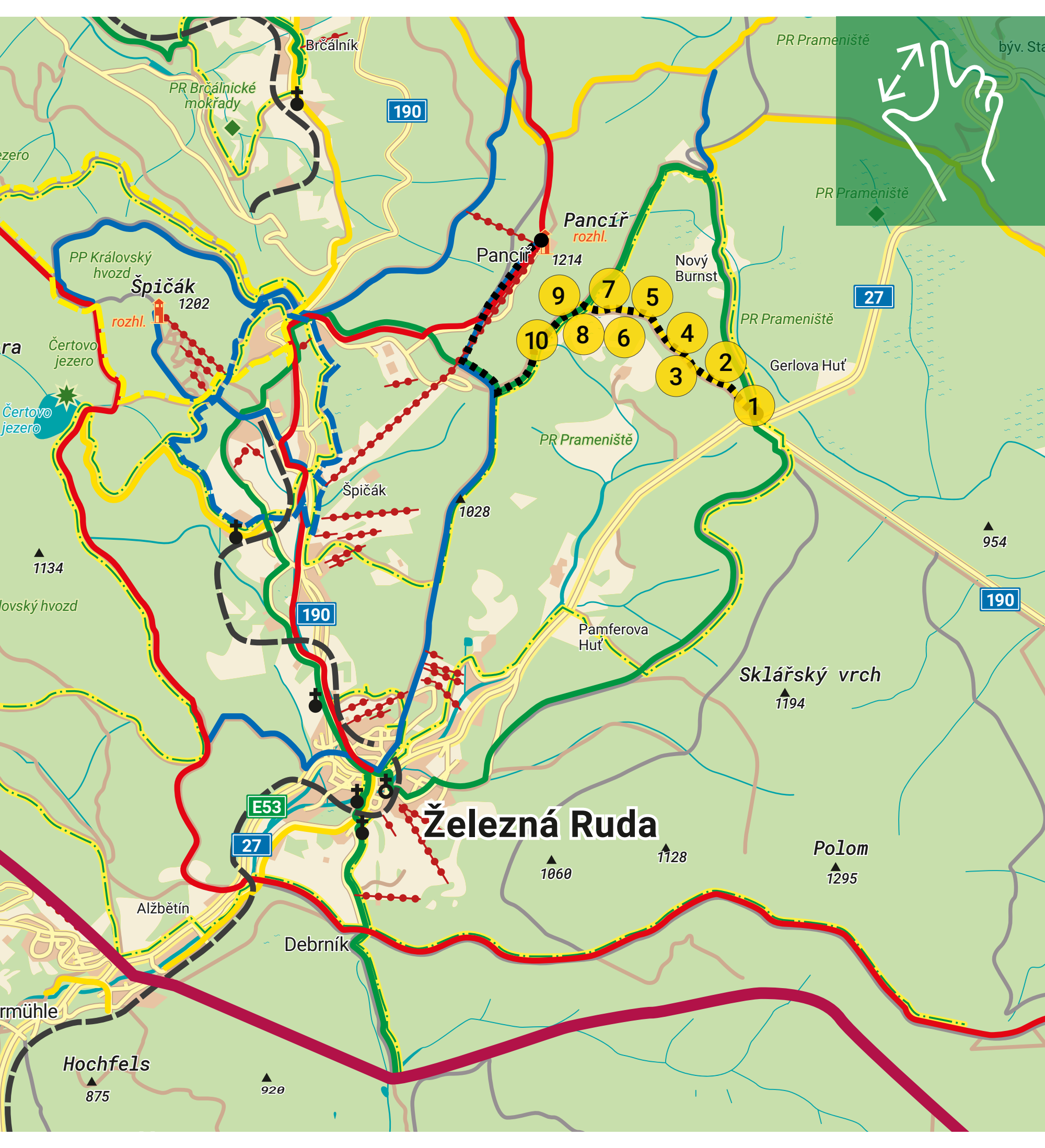

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8 Arthropods – insects and similar species

Length of Path 4,6 km

Arthropods – insects and similar species

Arthropods are the most numerous phylum of the animal kingdom. Their bodies are segmented. Each segment's size and function differs significantly. Usually they have a head, a thorax (or a cephalothorax), and an abdomen. Arthropods include groups like chelicerata, miriapoda, crustacea, and hexapoda. Scientists are not entirely clear about their evolutionary (phylogenetic) relations, each system has its own structure and they differ from each other a lot. In an ordinary person's perception, these subphyla contain groups commonly known as arachnids, centipedes, crustaceans such as crabs, lobsters, or shrimp, and insects.

Along this trail live many species of arthropods. The most visible are large, colourful, flying, or fast-moving ones that are easy to notice. Most often we encounter multi colored insects - flies (Diptera), beetles, butterflies, wasps (Hymenoptera), or grasshoppers (Orthoptera), heteropterans. We can also see various species of spiders. Some species of beetles, butterflies and other small animals are bound to a specific species of plants. For example, they may feed on a certain species, or their larvas can only grow in one specific inflorescence. This sometime shows in their name. A good example is the European spruce bark beetle. Some species develop on a plant, eat parts of it, use them as a hiding place, or even use them to trap smaller species.

Alongside the Snake Trail, we encounter many beetle species (longhorn beetle, dung beetle, weevil, jewel beetle) as well as many butterfly species (the satyrines, also known as the browns, the silver-washed fritillary, the poplar admiral...) Interesting species is the green huntsman spider. Commonly, we may come across the Orthoptera insects ensifera - locusts, the great green bush-cricket. We cannot miss the large anthills, ants being a very interesting social species of Hymenoptera insects, just like their close relatives, bees, wasps, and bumblebees.

Lately, a problem that has long been in the making has started coming to light. It is best illustrated at the example of butterflies. The older among you might remember how many butterflies they used to encounter when they were young and how many they encounter now. Currently, more than a half of the 150 butterfly species is endangered to a degree. Their populations dwindle and some species even die out in certain areas. Examples may be the hermit, mountain Apollo, and rare species of blue butterflies. There are several causes. For example, the climate - mild winters, when mould can enter the chrysalis and change the microflora of the intestines. Important is also the fragmentation of habitats. In the varied landscape of the 19th century, when each bit of agricultural land was tended to differently, populations could jump from an unsuitable locality right to the next, better one. But now, as the trend of large uniform masses of maize, oilseed rape, etc., butterflies have nowhere to 'jump'. Another problem are certain subsidies, which force the farmer to completely mow down an entire meadow in one date, which prevents the butterflies from moving from the unmowed side to the other and wait till that one grows back. Constant cutting of urban lawns and the creation of 'English' lawns by mowing the grass around the house a hundred times is not helping matters. If we add pesticides and insecticides to the picture and we have a disastrous situation.

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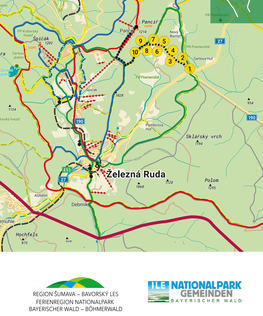

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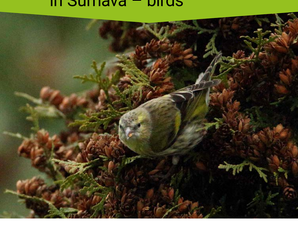
9 The descendants of dinosaurs in Šumava – birds



Length of Path 4,6 km

The descendants of dinosaurs in Šumava – birds

Birds are an integral part of our nature. We know that they are capable of flight because their lungs are the most efficient in the animal kingdom and equipped with air sacs as well as light and very firm skeletons. Their body temperature is higher than mammals' (around 44 °C), and they maintain it thank to their feathers. Their metabolism is very fast – the process from swallowing a berry till excretion can only take several minutes with some species. The fact that birds are the living relatives of dinosaurs can be a bit surprising but believe that it is so. The first ever feathered animal was the Archaeopteryx and it is considered to be the transitional species between dinosaurs and birds.

The woody slopes of Pancíř are a part of the largest bird area in the country. It is the Šumava Bird Area. The deforested part of Pancíř lies outside of the bird area. The area's objective is to protect these main nine species: western capercaillie, black grouse, hazel grouse, black stork, corncrake, Eurasian pygmy owl, boreal own, black woodpecker, and three-toed woodpecker. To these we can also count another twenty specially protected species such as the European honey buzzard, common kingfisher, Eurasian eagle-owl, or peregrine falcon. In 2000, more than 140 species of birds were recorded to live in the Šumava Landscape park.

In Postglacial Šumava, forest covers dominated the area and do so to this day. Forest species of birds thus dominate the local avifauna in the same way. Before that, during the last glacial period, there was tundra and by the end of the glacial it was taiga. A memorial to those harsh climatic conditions are species like ring ouzel, boreal owl, spotted nutcracker, or three-toed woodpecker. After the establishment of today's terrestrial biomes, the forest bird fauna established itself as well. If not for human interference, forest species would be the only bird species here. Šumava has around 60 typical forest species. Most common are common chaffinch, Eurasian wren, Eurasian nuthatch, European robin, coal tit, goldcrest, or common firecrest. Some species are bound to the holes left in trees by woodpeckers, for example the stock dove, or boreal owl. Typical spruce grove species include red crossbill, European crested tit, and the Eurasian siskin. Another species bound to spruce groves is the Šumavian Western capercaillie, whose once numerous population we are now trying to save from extinction. With the development of meadows, pastures, settlements and artificial bodies of water, a number of species which are not used to forested environments have entered Šumava. We can name for example the black redstart, whinchat, fieldfare, yellowhammer, corncrake, and tawny pipit.

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mikroregion
Šumava
západ

Ziel ETZ / Cíl EÚS
Freistaat Bayern –
Tschechische Republik
Česká republika –
Svobodný stát Bavorsko
2014 – 2020 (INTERREG V)

Europäische Union
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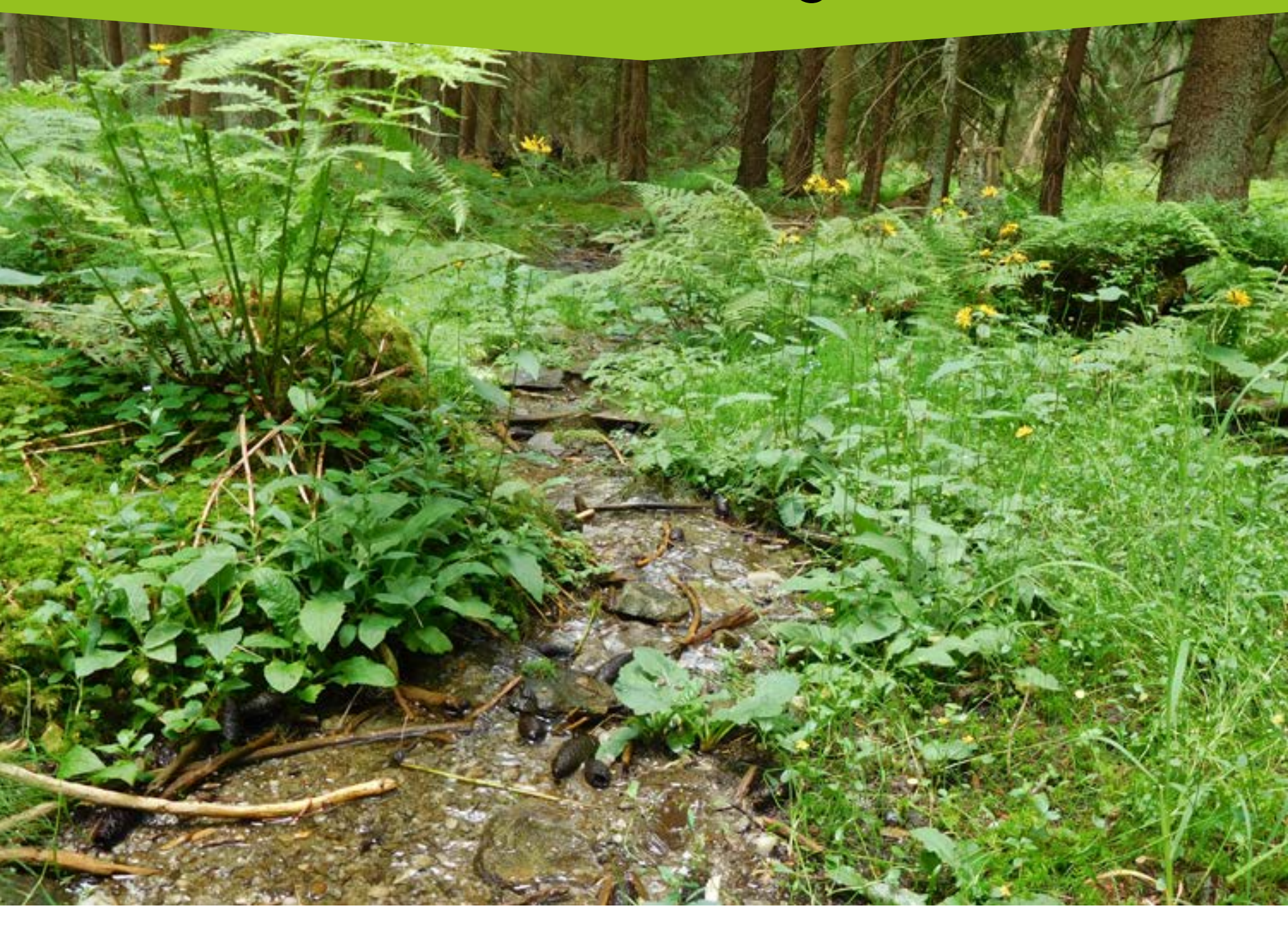
Snake Trail / Železná Ruda

10 NR Prameniště and the spring of the Řezná – Regen river



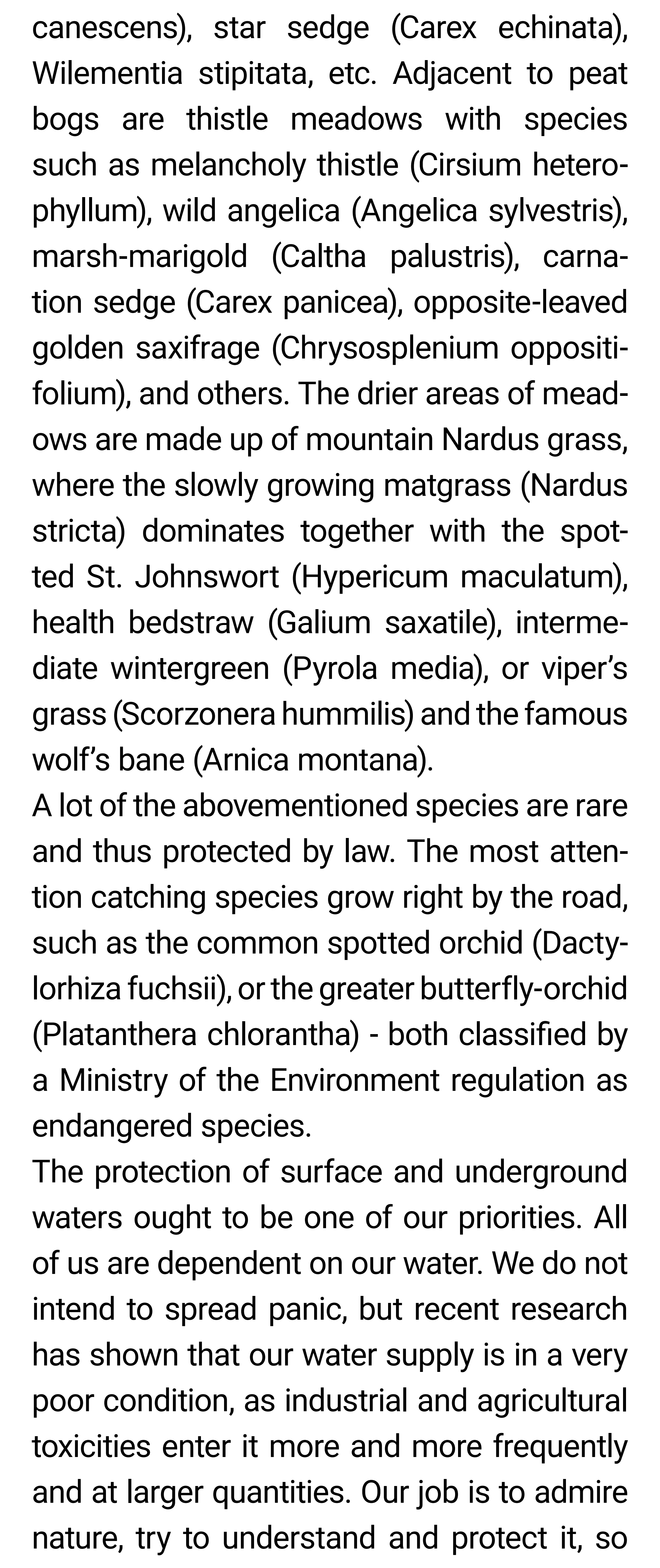
Length of Path 4,6 km

NR Prameniště and the spring of the Řezná – Regen river

The Prameniště natural reserve consists of four separate parts, where the rivers Křemelná and Režná, and the Slatinný and Gerlův streams, which then flow into Křemelná, spring. This NR lies in the PLA (Protected Landscape Area) Šumava, on the eastern sides of Můstek and Pancíř. On the western side of Pancíř springs another important river Úhlava.
The NR is made up of an extensive complex of springs and peat bogs together with meadow enclaves from times of the glassmakers' colonisation. It lies in the basin area, which looks like a pseudo-kettle with geomorphological signs of glacial activity in the late glacial period.
For the visitors of the Snake Trail, the most important part is NR Prameniště (Spring), which is adjacent to the trail. This part lies in the first zone of PLA Šumava. It is here that the Režná river springs and continues across the Bavarian border under the name Regen, and then flows into the Donau.

The spring area of Řežná is in its highest part (above the road) made up of waterlogged spruce forest with plant species such as the mountain tassel-flower (Soldanella montana), deer fern (Blechnum spicant), Alpine coltsfoot (Homogyne alpina), chickweed wintergreen (Trientalis europaea), interrupted club-moss (Lycopodium annotinum), alpine lady-fern (Athyrium distentifolium). In the moss layer, the Sphagnum genus of lichens dominates. In highly wet places around springs we can find Montia hallii, yellow pimpernel (Lysimachia nemorum), lesser spearwort (Ranunculus flammula), or hairy chervil 'Roseum' (Chaerophyllum hirsutum). Other peatbog plants include the common cottongrass (Eriophorum angustifolium), marsh valerian (Valeriana dioica), grey bog sedge (Carex canescens), star sedge (Carex echinata), Wilementia stipitata, etc. Adjacent to peat bogs are thistle meadows with species such as melancholy thistle (Cirsium heterophyllum), wild angelica (Angelica sylvestris), marsh-marigold (Caltha palustris), carnation sedge (Carex panicea), opposite-leaved golden saxifrage (Chrysosplenium oppositifolium), and others. The drier areas of meadows are made up of mountain Nardus grass, where the slowly growing matgrass (Nardus stricta) dominates together with the spotted St. Johnswort (Hypericum maculatum), health bedstraw (Galium saxatile), intermediate wintergreen (Pyrola media), or viper's grass (Scorzonera hummilis) and the famous wolf's bane (Arnica montana).
A lot of the abovementioned species are rare and thus protected by law. The most attention catching species grow right by the road, such as the common spotted orchid (Dactylorhiza fuchsii), or the greater butterfly-orchid (Platanthera chlorantha) - both classified by a Ministry of the Environment regulation as endangered species.
The protection of surface and underground waters ought to be one of our priorities. All of us are dependent on our water. We do not intend to spread panic, but recent research has shown that our water supply is in a very poor condition, as industrial and agricultural toxicities enter it more and more frequently and at larger quantities. Our job is to admire nature, try to understand and protect it, so that it may be preserved for future generations of all species.

Whole text



REGION ŠUMAVA – BAVORSKÝ LES
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