



## Bogs, flowing waters and nardus grasslands

The LIFE+ project in the Bavarian Forest National Park



NATIONALPARK  
Bayerischer Wald







*Dr. Franz Leibl*

## Foreword

The Bavarian Forest National Park and its emerging forest wilderness is one of the most important Natura 2000 sites in Bavaria. The region is one of only a handful of areas which enjoys conservation under both the EU's Birds Directive and Habitats Directive. However, this dual status also carries with it a unique responsibility for us. We aim to deliver on this responsibility by conserving and supporting the habitats and species which exist in our region. As part of the LIFE+ project "Bogs, flowing waters and nardus grasslands" financed by the European Union and the Bavarian Fund for Nature Conservation, we were able to implement a range of positive conservation-driven measures.

On the one hand, we succeeded in taking cultural historical preservation into account. One visible example of this is the grazing of the Ruckowitzschachten. The cattle that graze this area are not only reviving a tradition within the region, but also substantially enhancing a unique habitat featuring endangered nardus grasslands – an area undoubtedly deserving of protection. On the other hand, we were able to give the natural world more space in areas where natural processes had in part been massively disrupted by human activities in the past. By restoring bogs, watercourses and alluvial forests, species have been able to re-establish themselves in many areas where they had been forced into retreat.

The LIFE+ project has therefore actively supported the further development of the Bavarian Forest National Park. In tune with this, we will continue to work hard to achieve the conservation goals of Natura 2000 moving forward.

*Dr. Franz Leibl*  
*Head of the Bavarian Forest National Park Administration*





## Contents

|                                                                                                   |    |
|---------------------------------------------------------------------------------------------------|----|
| <i>The project area – Bavarian Forest National Park</i> .....                                     | 5  |
| <i>Natura 2000 and the LIFE programme - Conservation for habitats and species diversity</i> ..... | 6  |
| <i>The LIFE+ project at a glance</i> .....                                                        | 7  |
| <i>Bogs focus - Improving the water balance</i> .....                                             | 8  |
| <i>Watercourses focus - Natural dynamics and better passability</i> .....                         | 14 |
| <i>Historic pastures focus - Conserving nardus grasslands through grazing</i> .....               | 18 |
| <i>PR work</i> .....                                                                              | 22 |
| <i>The LIFE+ project in a dozen figures</i> .....                                                 | 23 |
| <i>Monitoring and outlook - What has the project achieved and what happens next?</i> .....        | 24 |
| <i>Our heartfelt thanks!</i> .....                                                                | 26 |
| <i>Imprint</i> .....                                                                              | 27 |

# LIFE+



## The project area – Bavarian Forest National Park

### The Bavarian Forest National Park...

...was founded in 1970 and is therefore Germany's oldest national park. Located directly on the border to the Czech Republic, it is a sanctuary for numerous animals, plants and fungus species across an area of over 240 square kilometres. True to the motto "letting nature be natural", the natural communities here are left to develop according to their own laws without the influence of man. Together with the neighbouring Šumava National Park in the Czech Republic, a borderless forest wilderness is emerging here which is unique within Europe.



### The natural world in the Bohemian Forest...

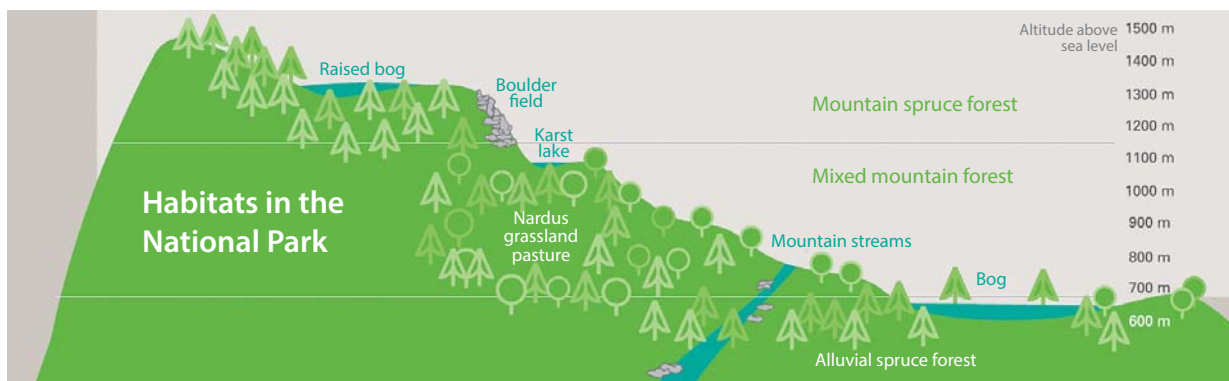
...is harsh. At altitudes ranging from roughly 600 to 1,453 metres above sea level, low-lying areas have an average annual temperature of 6.5°C, while averages clock in at just 2°C at higher levels. Annual precipitation is also very high here, with an average of 1,200 millimetres in valley areas and 1,600 millimetres up on the ridge.

The nutrient-poor bedrock is also characteristic for these harsh conditions – with types of granite and gneiss dominating. The natural communities within the National Park have been strongly influenced by the nutrient-poor and acidic ground created by the extended weathering and shaping of the landscape during the ice ages.

98 percent of the National Park surface area is forested – with mountain spruce forests, mixed mountain forests and alluvial forests dominating. In contrast, only small areas are free of trees, such as the mountain peaks, boulder fields, bodies of water, raised bogs, "Schachten" nardus grasslands (the clearings created by historical grazing activity) as well as meadow and fallow areas in valleys along the limits of the National Park. These unique areas are particularly valuable as they enrich the biodiversity of the National Park with their specialised communities.

### Is everything natural in the National Park? A word about human influence

Despite consistent conservation strategies, several habitats which are particularly deserving of protection have been or are currently endangered by human activity. This particularly applies to bogs, watercourses and the non-forest biotopes of the nardus grassland clearings – which is why the LIFE+ project was launched in the National Park with the aim of improving these habitats.



98 percent of the National Park surface area is covered by forest. A number of smaller special areas such as nardus grassland clearings, raised bogs and mountain streams are, however, also home to some highly specialised flora and fauna.

# Natura 2000 and the LIFE programme

## Conservation for habitats and species diversity

In the effort to conserve diversity of species and habitats in Europe, Natura 2000 is an important building block: With a total area of more than one million square kilometres, it is the largest network of protected areas of its kind anywhere worldwide. A total of 745 Natura 2000 areas were designated in Bavaria alone. Together, these make up around 11.36 percent of the total surface area of the state (March 2018).

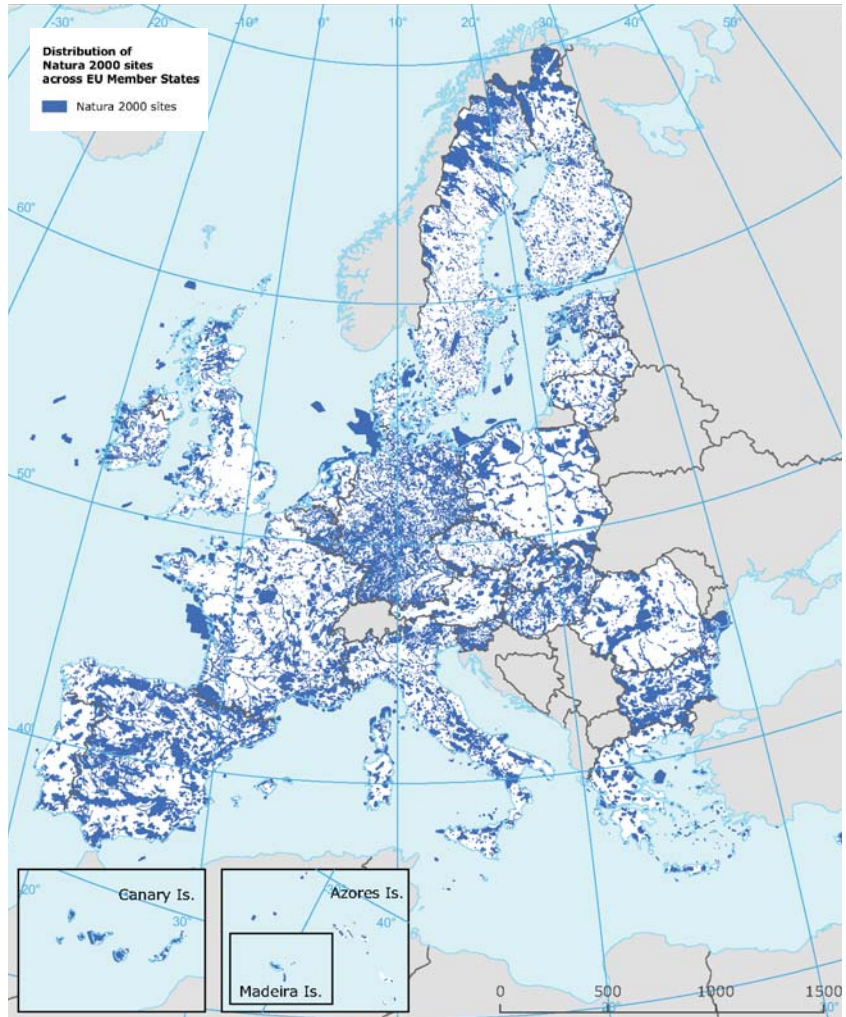
The Bavarian Forest National Park has been a Natura 2000 protected area since 1998 and it is one of only a handful of Bavarian regions with a dual status protected under both the Birds Directive and Habitats Directive.

### Natura 2000 ...

...is a pan-European network of conservation areas. It is based on two European Union guidelines: the Birds Directive of 1979 and the Habitats Directive of 1992.

Natura 2000 aims to preserve and restore biological diversity within the European Union. Endangered wild animal and plant species as well as their natural habitats are to be conserved by designating protected areas across the European continent.

However, the protected areas are not just strictly protected spaces without human interference in fact many areas require sustainable management in line with the motto "protection through use".



The network of Natura 2000 areas stretches across the entire European Union and therefore plays an important role in protecting endangered animal and plant species as well as their habitats.



### LIFE ...

... stands for L'Instrument Financier pour l'Environnement, which means "the financing tool for the environment". LIFE is an EU funding tool designed to finance measures which allow Natura 2000 areas to be improved. Similar to the Habitats Directive, the programme celebrated its 25th anniversary in 2017.



# The LIFE+ project at a glance

## A profile of the LIFE+ project in the Bavarian Forest National Park

### Project aims

- + Hydrologic restoration of bogs and peatland forests
- + Restoration of connectivity and natural dynamics of rivers and streams
- + Trial grazing of historic pastures to preserve nardus grasslands
- + Increasing knowledge and acceptance of Natura 2000

**Duration:** October 2013 - September 2018

**Project budget:** 1.3 million euros

**Contact:** [poststelle@npv-bw.bayern.de](mailto:poststelle@npv-bw.bayern.de)

This project is funded by the European Union, the Bavarian Forest National Park, and the Bavarian Fund for Nature Conservation.





## Bogs focus

### What is a bog?

Bogs can develop in areas where there is excess water in the landscape. Normally, numerous microorganisms break down dead plant matter into small components such as carbon dioxide (CO<sub>2</sub>), water and various nutrients.

At water saturation, i.e. under air exclusion, these processes take place much more slowly. As a result, parts of plants are not completely decomposed and instead gradually form a layer of peat which grows by one millimetre a year on average. A bog with a peat depth of five metres is therefore some 5,000 years old!

### Bogs in the Bavarian Forest National Park

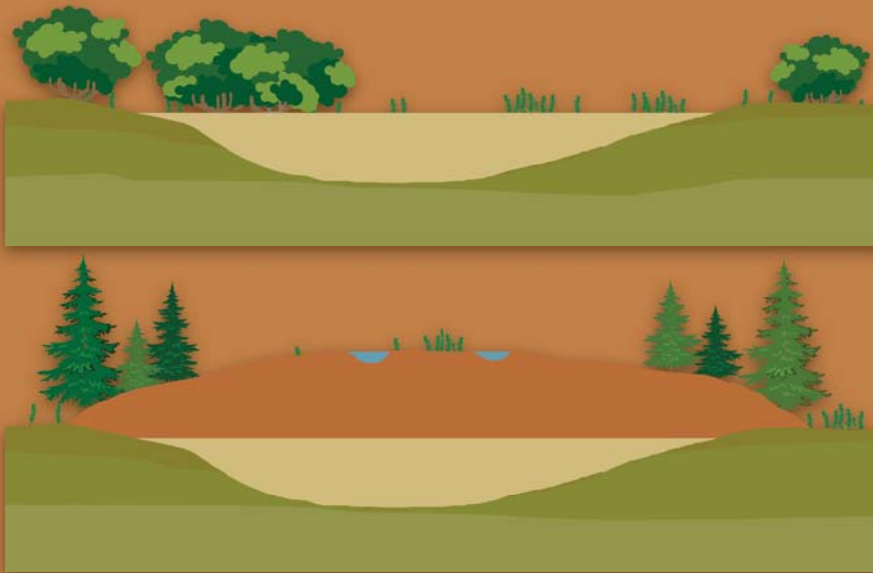
Due to the cool climate and the high levels of precipitation, the Bavarian Forest offers ideal conditions for the formation of bogs. Within the National Park, bogs are primarily found in valley bottoms and on mountain saddles where excess water can only partially drain away.

### Raised bog vs. fen

If a bog is still fed by (more or less nutrient-rich) groundwater, it is referred to as a fen.

However, if the layer of peat has grown so high that it extends out above the surface of the land and the peat body is only fed by rain water, this is known as a raised bog or ombrotrophic bog.

The living conditions in this type of bog are extreme – the scarcity of nutrients, acidic conditions and high water level mean that only well-adapted specialists can survive in this ecosystem.



*The creation of a bog: In air exclusion, the remains of plants collect and are only partially decomposed; a fen is created (yellow). If the dome of peat grows above the surface of the land, the connection to the groundwater is cut off – and a raised bog emerges (orange: raised bog peat).*

### The round-leaved sundew (*Drosera rotundifolia*)

...catches insects with its leaves which secrete sticky mucilage on tiny tentacles – securing a source of additional nutrients in the otherwise meagre raised bog environment.



### Peat moss (*Sphagnum* sp.)

...is the most important creator of peat in raised bogs. This moss grows tirelessly skywards as the lower sections of the plant die off and turn into peat. With its great ability to retain moisture – peat moss can retain up to 20 times its own dry weight in water – these plants are also of decisive importance for the water balance of bogs.

### The raised bog ground beetle (*Carabus menetriesi pacholei*)

...is strictly protected by the Habitats Directive. This beetle, which is unable to fly, has survived in the border mountains of Eastern Bavaria as a relic of the ice age, but it is reliant on large, intact swathes of peatland. The LIFE+ project contributes to improving these habitats.





## Improving the water balance

### The influence of human activity

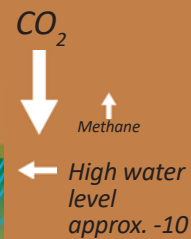
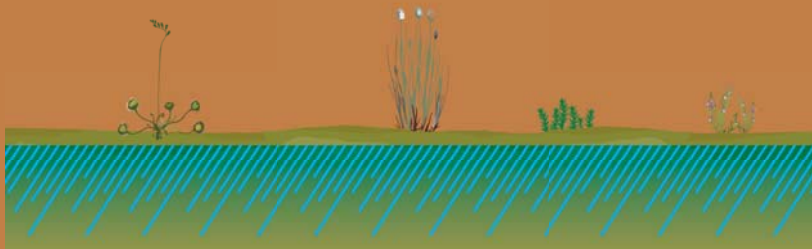
Due to the extreme living conditions, the commercial use of near-natural bogs is extremely limited. That is why numerous bogs have been drained and afforested since the 18th century.

However, falling water levels trigger various, and sometimes irreversible processes which result in an enormous deterioration of the valuable bog habitats – right through to their complete destruction.

The exposed and aerated upper layers of peat decompose, the bog's ability to retain water is lessened, and nutrients and climate-relevant gases like CO<sub>2</sub> and nitrous oxide previously locked up within the peat are released.

As a result, drained bogs can no longer fulfil important functions for water retention and climate protection. In addition, rare plant species based within the bog are displaced by less specialised species.

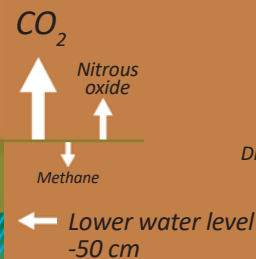
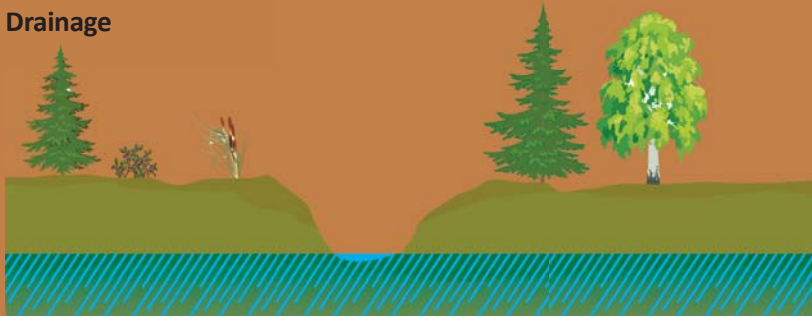
### Near-natural situation



Balance:  
Intact bog acts as a sink

An intact bog operates like a sink: The remains of plants are not completely decomposed due to the high water level and therefore carbon compounds – such as the greenhouse gas CO<sub>2</sub> – are locked into the dome of peat.

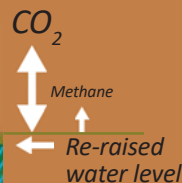
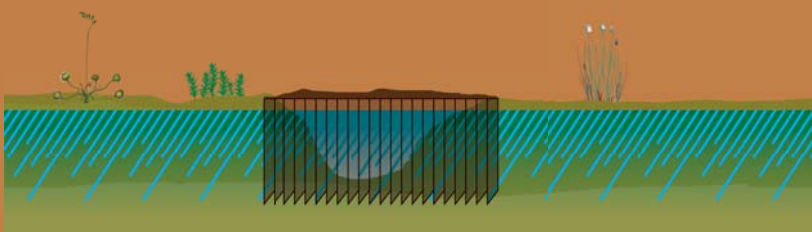
### Drainage



Balance:  
Drained bog acts as a source

If the water level is lowered by human activities, the now aerated peat layers decompose. Products of decomposition, such as CO<sub>2</sub>, then escape into the atmosphere or groundwater. The bog is transformed from a sink into a source – with negative consequences for the climate, flora and fauna.

### Restoration



Balance:  
? Depending on water level, time...

The principle of bog rewetting is to raise the water level – e.g. with the help of dams – back to a near-natural level. This is the only way for typical bog plants to recolonise and peat formation to be set in motion again.

### Restoration

In an effort to stop these processes in their tracks, an effort was made as early as the 1980s and 1990s to restore drained bogs.

The principle is as follows: By sealing the drainage ditches, the water is once again retained in these areas. This process is known as rewetting. When the water level then rises to a near-natural level – only a few centimetres below the surface of the bog in an intact raised bog – the bog can start to regenerate.

Restoration needs **time**: Depending on how badly damaged the bog already is by drainage, it can take decades if not centuries until a growing raised bog re-emerges.

## Bog restoration in the LIFE+ project

As part of the LIFE+ project, rewetting work was undertaken at the three remaining degraded raised bogs Kreuzstraßl, Kleine Au and Tieffilz which could still be restored.

### Kreuzstraßl

The peatland complex at Kreuzstraßl is home to a colourful mosaic of hanging bogs, percolation mires and raised bog areas across a roughly two-hectare site. However, this small bog has been heavily damaged by drainage, afforestation and peat cutting.

From August to October 2015, some of the spruce trees were removed and the drainage ditches dammed. In addition, the population of invasive bracken was successfully forced into retreat.

*Accumulation of water below the former edge of the peat cutting in the bog at Kreuzstraßl*



*The water table is rising in the area of birch and alder swamp forest – and the beavers also enjoy this habitat...*

### Kleine Au

The Kleine Au near Altschönau is a good ten hectares of ombrotrophic bog with neighbouring hanging bog areas. In the heart of the bog, a peat depth of up to 5.45 metres has been measured!

Several drainage ditches running across the entire surface area as well as the massive afforestation effort with spruce trees have led to raised bog specialists being almost completely displaced and the uppermost peat layers being mineralised. In order to restore the bog to a near-natural condition, stout measures were required.

In summer 2016, the majority of the spruce trees in the former tree-less centre of the bog were removed in order to reduce the high evaporation rates.

In a second step, the drainage ditches were blocked with a total of 46 dams. Different dam designs were used depending on the dimensions of the ditch in question. The large number of dams was essential in order to raise the water table as evenly as possible in the sloping landscape. At the lowest points, the ditches were also completely filled in with peat.

*The removed spruces were carried away by air using a cable crane in an effort to preserve the sensitive surface of the bog.*



June 2016

August 2016



## Tieffilz

The two-hectare saddle ombrotrophic bog is located in the heart of the National Park between Sulzriegel and Hoher Filzberg. Compared to Kreuzstraß and Kleine Au, this bog was still very well preserved – at least in part because restoration measures were already introduced here at the start of the 1990s. However, the majority of the pile walls were no longer water-tight due to the influences of weathering and water. In order to nevertheless keep this valuable small bog preserved, the existing dams were complemented with four new pile walls as part of the LIFE+ project.

One unique challenge centred on the inbound transport of the construction material: As the Tieffilz is not fed by access paths of any sort, helicopter transport was required. This meant that 120 cubic meters of sawdust and chips were transported to the site to cover the dams in addition to the pile wall construction timber.

In August 2017, almost 40 volunteers from the association Bergwaldprojekt then built the new pile walls by hand. Thanks to the coating of sawdust and chip mixture as well as the previously removed plant turf, the new dams are now airtight.



The volunteers performed impressive work during the two restoration weeks – as seen here as they construct a new pile wall.

Before: The over 20-year-old pile walls were now only partially effective.



After: The water table rose immediately after the dams were built.

Kleine Au

Tieffilz

This series of shots shows a ditch in the Kleine Au before, during and after restoration



October 2016

April 2017

## Peatland forests and purchased land

### Peatland forests

Not only raised bogs, but also peatland forests – i.e. forests growing on wet peat substrate with a high groundwater level – were drained in many places, with resultant consequences for the water balance, flora and fauna. In the National Park, spruce peatland forests make up the largest proportion of this habitat.

As part of the LIFE+ project, the existing drainage ditches at eleven different peatland forest locations were mapped across an area totalling 95 hectares in size. Of this area, 45 hectares were originally slated for hydrological improvement – but ultimately restoration measures were carried out across almost 60 hectares at six locations.

In total, over 150 dams and a good 200 metres of drain filling were added with the aim of creating a more natural water balance in the peatland forests of the National Park.

### Purchased land

By acquiring private properties on the edge of the National Park in the Großer Filz and Klosterfilz areas as well as by the Bergerau, Sagwasser, Glashütte and Reschbach, another ten hectares of land were gained for nature conservation. The wet habitats impacted by drainage, watercourse straightening and debris were also restored.

*At Siebenellen, spruce trees were removed using a transport helicopter.*

### Purchased land in Siebenellen

The area on the edge of the Klosterfilz at Siebenellen was dominated by a network of drainage ditches and a monotone population of spruce trees before the restoration work. Some of the spruce was felled in October 2017 and – given the lack of alternative options – transported from the area using transport helicopter. The drainage ditches were subsequently dammed using a total of 26 dams and debris removed from the area.



### Purchased land in Riedlhütte

International dams like this are rare – built by young people from the United Arab Emirates, Romania, Germany, the USA, China and Spain. In August 2017, the school pupils dammed two drainage ditches by hand on the edge of the Großer Filz near Riedlhütte – and thanks to three new dams, the water table here is now rising again.

*Young people from all over the world helped in the restoration work.*







**The black stork (*Ciconia nigra*)**

...is a shy individual. It prefers old, structured forests with clearings, bodies of water and watercourses. It feeds on more creatures that live in or around the water than the white stork.

**Peatland forests in the Rachel-Lusen area**

In Reschbachtal, areas containing both young plants and older populations of peatland forests have seen hydrological improvement. Many drainage ditches have also been blocked in peatland forests near Neuschönau, Altschönau and Guglöd.

*Construction of a log dam*



**Purchased land on the Sagwasser**

To the south of the restored area, a wet meadow was successfully acquired on the Sagwasser. After the removal of several spruce trees, space has now been created for near-natural bank vegetation – and the beaver is able to help shape this stretch of river as it pleases.



**Bergerau**

The Bergerau between Altschönau and St. Oswald is a multi-faceted bog complex with both wooded and open areas. The existing, still active drainage ditches were rendered ineffective by dams and trench-filling work.

*The areas where peat was removed for filling the ditches also serve as valuable mini-biotopes, such as here in the Bergerau.*





## Watercourses focus

### Watercourses in the Bavarian Forest National Park

There is no shortage of water in the National Park. Thanks to the high levels of precipitation, numerous streams originate in the Bavarian-Czech border region. A dense network of watercourses with a total length of some 700 kilometres runs through the National Park. These streams are cool, rich in oxygen, low in nutrients and fast flowing across the stony ground. Due to these conditions, only a few well-adapted animal and plant species can live in these waters.

Riverine brown trout and European bullhead are the only species of fish found in the watercourses of the National Park. Other characteristic animal species typical for this mountain stream habitat include the white-throated dipper, the grey wagtail and Eurasian otter.

The water from the National Park is also of great importance for the people in the region: The drinking water reservoir in Frauenau fed by the streams of the National Park as well as additional sources provides over 500,000 people with high-quality drinking water.

### The Eurasian otter (*Lutra lutra*)

...was almost extinct in the Bavarian Forest – however since the 1970s its population has been able to recover on the back of support measures, among other factors. LIFE+ also contributes to another improvement in its habitat: Thanks to the renaturation of streams and the restoration of their passability, the habitat has been enhanced for fish – which in turn serves the otter as a source of food.



### Timber rafting

Many of the streams in the National Park were used for transporting timber in centuries past. Up until the 1920s, wood from the Bavarian Forest was washed down the watercourses to Passau and Regensburg. To make this possible, the streams had to be straightened and their banks reinforced.

*The bank reinforcements constructed for transporting timber are still visible in many places today – with negative consequences for the streams' ecosystems.*

*Many streams in the Bavarian Forest were straightened for timber rafting and their banks reinforced*



The bank reinforcement work often featured so-called “B'schlacht-hölzern” – wooden tree trunks integrated lengthways into the bank. In many spots, these reinforcements still exist today. On the one hand, they are worth protecting as important relics of the cultural history of the region, but on the other they have negative impacts on the ecosystems in question: The “corset” of the straight watercourse construction limits the dynamics of the water and the connection to the floodplains. A lack of bulges in the watercourse, shallow and deep water zones, calm and fast-flowing areas results in reduced diversity in sub-habitats within the streams.



### Renaturation...

As part of the LIFE+ project, sections of the timber rafting infrastructure were removed along suitable stretches of water in order to allow natural flow dynamics to return. This creates areas which the water can attack, allowing the stream to continuously redesign its course. This in turn yields new structures which are vital for the diversity of streams as habitats.



*The removal of the bank reinforcement increases the structural diversity and natural dynamics within the watercourses.*



*Alongside the Sagwasser, an information board informs visitors about timber rafting and renaturation.*

### ...and historic preservation

In other areas, the timber rafting constructions were consciously maintained in order to allow visitors to experience them.



### The Riverine brown trout (*Salmo trutta fario*)

...gives the so-called "trout zone" section of the stream its name. These fish are primarily found in fast-flowing, cool and oxygen-rich upper courses. They benefit from the structures created by the renaturation work.

The development of the fish population in the streams restored as part of LIFE+ is being monitored using electrofishing.

### The European bullhead (*Cottus gobio*)

...measures in at only 12 to 16 centimetres. Its food sources include insect larvae and fresh-water shrimp. This species is perfectly camouflaged on the stony river bed thanks to its colouration. This is useful as the European bullhead is a poor swimmer. Due to the way they move around – jerky movements with their pectoral fins spread while crawling along the bottom – even small steps in the watercourse can quickly become insurmountable obstacles. The European bullhead is protected Europe-wide by Annex II of the Habitats Directive.





## Watercourses focus



### Waldhüttenbach

The Waldhüttenbach near Spiegelau was restored in 2014 along 400 metres of its course. The dense spruce population on the banks of the stream was thinned out and the bank returned to a near-natural state by removing the B'schlachthölzer.

A plank walkway with multiple platforms was created for visitors. Four information boards offer insights into the measures and the typical inhabitants of the stream and peatland forest habitats.

*The new LIFE+ walkway allows visitors to experience the restored section of stream up close. Watercourse renaturation*



*Areas where the Waldhüttenbach previously ran completely straight have now gained much more multi-faceted habitat structures after renaturation*

### Kleine Ohe

The Kleine Ohe was restored in 2014 between the National Park road and Bergerau. In some parts, the course of the stream was already near-natural – but now the bank construction has been removed along an over 1.5-kilometre section.



*The water balance of the alluvial forest is being restored back to near-natural levels thanks to the filled-in trenches and loosened structure of the road.*

The drop below the National Park road which was previously virtually insurmountable for fish was made more easily passible with a fish ladder.

The forestry road which runs parallel to the Kleine Ohe underwent renaturation work in 2015 along a one-kilometre stretch – this improved the connection between the watercourse and meadows, and made the walking path more attractive.



*Thanks to a bypass stream, fish can now once again move through a section of the Kleine Ohe which was previously far too steep.*





## Natural dynamics and better passability

### Passability of the watercourses

It is not only timber rafting, but also the construction of roads, forestry roads and railways that have impacted the smaller streams in particular: Streams are channelled through slick pipes below these transport routes, with high drops often located in the areas where the water exits the pipes – an impassable obstacle for the European bullhead, and often even for the stronger Riverine brown trout and other species.



Whether ramps, open pipes, bridges or fords: As part of LIFE+, 20 water channels across the entire National Park area were reconstructed to make them passable again for the species affected.

*In the Mittelsteighütte area of pristine woodland, two water channel pipe sections were replaced with wooden bridges.*



*Even small obstacles are impassable for the European bullhead.*

*At several points, the pipes were completely removed and the channels redesigned as fords.*

### Reschbach

The acquisition of two properties and cooperation with conservation associations paved the way for the renaturation of the stream course of the Reschbach along a one-kilometre stretch.



### Sagwasser

On the Sagwasser near Weidhütte, spruce trees were removed in suitable places in order to allow for a more natural development of the bank vegetation. The B'schlachthölzer were removed in some places in 2016 and rhizomes folded back – in part due to the ownership structure on only one, and sometimes on both banks. In addition, the channel below the National Park road was optimised with a ramp.



*A restored stream bed, like the one here on the Sagwasser, is not only more attractive for the water dwellers but also for the human eye.*



## Historic pastures focus

### Schachten ...

...is the name used locally for the (former) mountain pastures in the Bavarian Forest. These clearings of open grassland surrounded by forest were created in the period since the 17<sup>th</sup> century through deforestation and subsequent use as grazing pasture. In the summer months, the farmers drove their cattle up to higher levels – during the day they would graze the forest before they headed into the Schachten pastures at night for protection against predators.

### Pearls in the sea of forest...

...is one loving description for these unique pastures, and not without good reason: The 15 still preserved Schachten in the National Park are home to at least 215 different species of plants. These include rare species such as arnica, moonwort and the Hungarian gentian. That is why the mountain pastures and diverse nardus grasslands of the Schachten are also a protected habitat within the Natura 2000 conservation network.



### The Hungarian gentian (*Gentiana pannonica*)

...grows to between 25 and 60 centimetres in size. The Bavarian Forest and the Alps are the only places this plant grows domestically. In the former, it thrives in the nardus grasslands at higher levels.



### The wart-biter (*Decticus verrucivorus*)

...is one of the largest bush crickets in Central Europe. It is predominately found in short-turf mountain grassland. In Germany, the species is considered endangered, though these creatures are still very common in the Bavarian Forest.





## Conserving nardus grasslands through grazing



*During the grazing period, the trees in the Schachten served as shelter – and these imposing beech, maple and spruce trees which are sometimes 400 years old have grown in unique shapes and are now centres of great species diversity.*

### Giving up commercial usage

Over the course of the 20th century, the grazing of these pastures became increasingly unprofitable for farmers – and this traditional use was therefore abandoned completely in 1963 within the area of the current National Park.

Without this activity, the forest slowly reclaimed these areas. That is why voluntary conservation measures are committed to preserving these pastures as open spaces, primarily through the removal of shrubs. However, the typical influences provided by the selective feeding and trampling of cattle is lacking in these cases. Species adapted to living in grazed pastures are therefore displaced over time by dwarf shrubs and Alpine grass.



*The last shepherds on the Ruckowitzschachten: Josef Schmid with his sons Fritz and Erwin*

### Arnica (*Arnica montana*)

...is well known as an anti-inflammatory healing plant. The plant, which is now rare, enjoys good germination conditions on extensive pastures – particularly in open areas of soil exposed by cattle trampling.



### The purple-edged copper (*Lycaena hippothoe*)

...is one of Germany's highly endangered species. Its important habitats include the nutrient-poor acidic grasslands in the Bavarian Forest. Its caterpillars only eat sorrel, which grows in abundance in the Ruckowitzschachten.



### Nardus grass (*Nardus stricta*)

...is not an appealing food source for cattle and is therefore typical of low-lime pastures. However, as soon as grazing stops, this type of grass is not as well equipped to compete with other plants and is increasingly forced to retreat.



## Historic pastures focus

### The Ruckowitzschachten ...

...is the largest pasture clearing in the National Park. Up to 30 hectares in size in the 19th Century, it now only extends to almost 13 hectares below Falkenstein at an altitude of around 1,150 meters above sea level. Its name came from a misunderstanding: When the first maps of the area were produced, the surveyors had difficulty understanding the locals. Up to that point, the pasture was known as the "Rucka-Wies" – meaning "the meadow on the back of the mountain".

In addition to valuable nardus grasslands and mountain hay meadows, there is also a small hanging spring bog in this clearing. This area is home to specialists such as the common butterwort, a carnivorous plant, and the common spotted orchid.



Since 2014, the Ruckowitzschachten has been grazed by Rotes Höhenvieh, an endangered breed of red cattle.

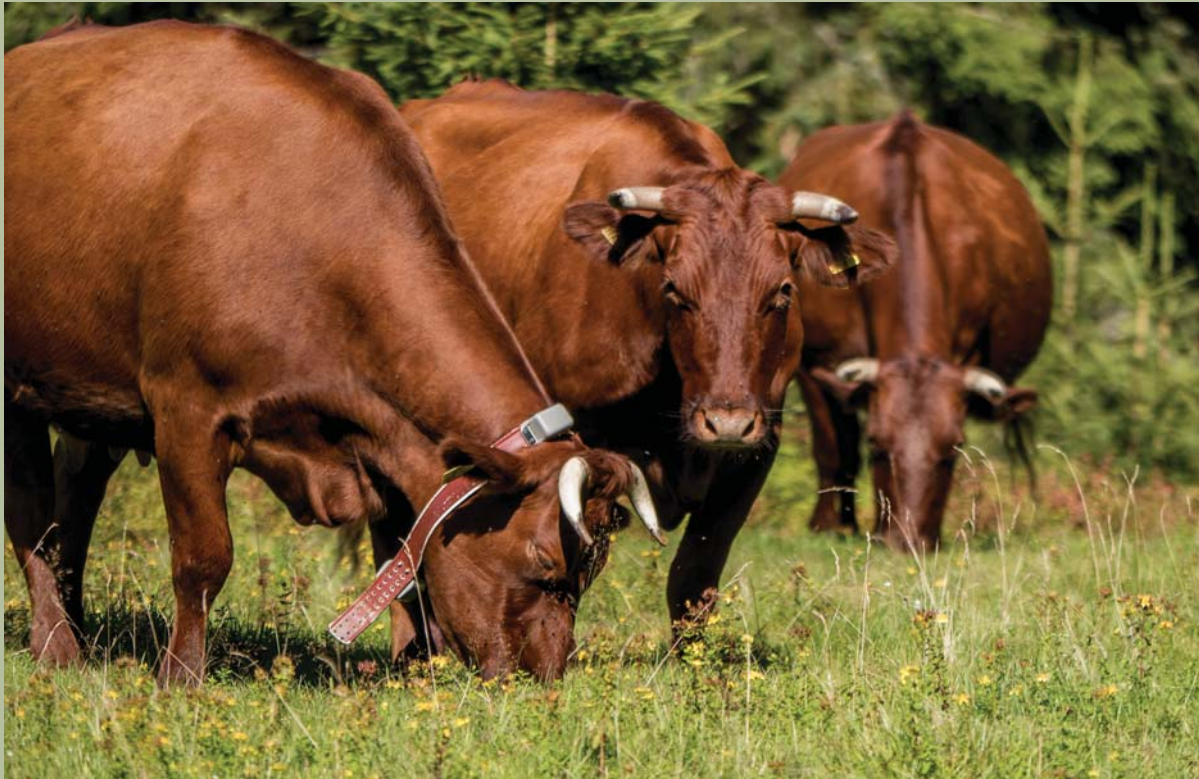
### Cows for conservation

In order to preserve the nardus grasslands with their characteristic range of species, extensive grazing of the Ruckowitzschachten with the Rotes Höhenvieh cow was tested as part of the LIFE+ project. On an area of around six hectares, the six to ten-cow herd has been grazing the pasture every summer since 2014.

The animals acquired by the National Park at the start of the project are housed in the animal enclosures at the Falkenstein National Park Centre during the winter months. Due to the altitude, the Ruckowitzschachten is only grazed between June and October – though the exact grazing period varies from year to year depending on the development of vegetation. In spring and autumn, the cattle also spend time on the transitional pastures in the valley near Kreuzstraß.







  
Hochschachten

### The Rotes Höhenvieh (red upland cattle)

... is an undemanding and durable breed of domestic cow. Thanks to these characteristics, it was primarily used in harsh and barren medium-sized mountain chains as a conventional cow for dairy, meat and transportation in the past. The breed, which has red to dark-brown colouration, was named “Endangered breed of the year” in 1997. Thanks to its use in landscape conservation, the population of this breed of cattle, which offers high-quality meat, has started to grow again in recent times.

### Initial results of the pasture monitoring

A grazing project should be managed in a way that produces the best possible result for biodiversity – and this is not an easy task. But the cattle have done great work to date – an opinion also shared by experts who have been supporting the grazing project since day one, including assessing progress from a vegetation-related standpoint. In this respect, the number of plant species has risen across a large section of the area under observation, and thick areas of blueberries have been opened up. Valuable bog areas are nevertheless being preserved.

### Extending pasture grazing

Due to the positive monitoring results, the cattle are gaining additional pasture space from summer 2018 – the areas of nardus grasses on the Hochschachten will therefore also benefit from the landscape preservation work of the red cattle moving forward. The conservation development of both areas will continue to be monitored even after the project concludes and the management of grazing activity flexibly adjusted.

## PR work



Locals, visitors and specialist groups were informed about the project on numerous tours and field trips.

### LIFE, Natura 2000, renaturation - what is that?

Successful conservation also requires PR work – after all, planned conservation measures are only sustainably realisable if they are accepted locally. Visitors to the National Park also act as important multipliers who take their enthusiasm for the Park and its unique habitats home with them.

In the five years of the LIFE+ project, locals and visitors were therefore informed about the focuses of the project and actively integrated into it in a range of different ways.

# [www.nationalpark-bayerischer-wald.de/life](http://www.nationalpark-bayerischer-wald.de/life)

A photo competition was held for the production of a postcard covering the topic of pasture grazing – and the results were impressive. The bog and stream postcards also proved popular.



The Schachtenfest brought young and old together.



Filming for the project's image film. A short film produced as part of LIFE+ on the subject of water in the National Park is showing in the cinemas of the National Park centres as well as online.

Information on the LIFE+ project is available online, in leaflets and brochures, as well as at the visitor centres of the National Park.

Within the landscape itself, visitors can also find out more about valuable habitats, rare species and the renaturation measures involved in the project on information boards.

More than 20 experts took part in discussions at the water-courses symposium.

The four presentation pillars of the touring exhibition have appeared at five locations to date.



## The LIFE+ project in a dozen figures

**1,378,128**

euros has been made available for the project measures.

More than **260** dams were built to restore raised bogs and peatland forests.

**700**

metres of drainage trenches and old tracks were filled in.

**60** hectares of peatland forest and spruce alluvial forests were hydrologically improved.

**4.6**

kilometres of streams were restored.

**34**

water channels were made passable again.

The water table in the bog Kleine Au bog rose by up to **66** centimetres.

**120**

The dams in the Tieffilz were covered with **120** cubic metres of sawdust and chips.

**8**

red cattle calves were born during the course of the project.

Over **100** volunteers were involved in the renaturation of the bogs.

**381**

days of grazing were completed by the red cattle herd on the Ruckowitzschachten.

**77**

tours, field trips and presentations were carried out on the project.

**320**

metres of LIFE+ walkway were built along the Waldhüttenbach.

## Monitoring and outlook

### What has the project achieved and what happens next?

#### Monitoring

...is the systematic observation and recording of a system and the processes which take place within it. This can, for instance, enable the evaluation of renaturation measures – and this requires recording before and after the implementation of said measures. In the LIFE+ project, the monitoring work is carried out with the external support of universities and biologists.

#### Socio-economic monitoring

Not only ecosystems, but also the local economy and population can benefit from conservation projects: A study is examining what added value the LIFE+ project has created in the region. One result: Almost half of the spending made within the project totalling 1.3 million euros remained in Freyung-Grafenau and Regen counties.



#### How are conditions at the affected habitats developing?

In the case of bogs, peatland forests and watercourses, examinations initially checked the existing state of conservation in the affected habitats before and after the renaturation. The Habitats Directive requires mapping work for this: For instance, is the area impacted by drainage trenches? Do the typical plant species for the habitat still exist in the area?

The first results have not yet shown any significant changes in the composition of the vegetation. However, this was not expected given the short time since renaturation. The condition of the habitat has already been improved by eliminating impairments, such as the drainage trenches and bank constructions. The coming years should therefore also see flora react to these measures.



#### Bog monitoring

In the three raised bogs, the effects of the renaturation measures were precisely observed: In each of the three bogs, water level tubes were installed to measure the water table. The development of the bog vegetation is also checked using permanent observation areas.

While the development of vegetation needs more time, the change in the water level was quickly visible. The rise has already exceeded half a metre in several of the water level tubes.

The further development of the restored raised bogs will – in greater time intervals – be checked in the longer term: After all, the regeneration of particularly badly damaged bogs is a long process...

*With the help of water level tubes, the development of the water table in the restored raised bogs is documented.*



## Promises kept?

In the five-year duration of the LIFE+ project, the planned measures were implemented systematically, making an important contribution to the conservation and improvement of valuable habitats in the bogs, watercourses and Schachten pastures in the Bavarian Forest National Park.

|                                                                                                   | Planned                                        | Executed                                                                                        | Completion ratio |
|---------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------|
| Land acquisition                                                                                  | 6.5 ha (in the Großer Filz / Klosterfilz area) | 10.1 ha (extended acquired area)                                                                | 162%             |
| Renaturation of raised bogs (LRT 7120, *91D4, *91D1, 7140, 6410)                                  | > 5 ha                                         | > 5 ha                                                                                          | 100%             |
| Hydrological enhancement of bog forests and luzula-spruce-fir forests (primarily LRT *91D4, 9410) | 45 ha                                          | 60 ha                                                                                           | 133%             |
| Restoration of the natural dynamics of the watercourses (LRT 3260)                                | > 5 km                                         | 4.6 km                                                                                          | 92%              |
| Reconstruction of water channels                                                                  | Up to 20                                       | 34                                                                                              | 170%             |
| Improvement of the nardus grasslands on the "Schachten" pastures through grazing (LRT *6230)      | 4.4 ha                                         | 3.5 ha nardus grassland on the Ruckowitzschachten<br>3 ha nardus grassland on the Hochschachten | 148%             |
| PR work                                                                                           | > 10 press releases                            | Over 25 press releases                                                                          | 250%             |
|                                                                                                   | > 15,000 visits to the LIFE+ website per year  | A total of 13,000 visits to the LIFE+ website                                                   | 17%              |
|                                                                                                   | > 20 tours und field trips                     | 77 tours, field trips and presentations                                                         | 385%             |

## After-LIFE – What comes next?

First, the restored bogs, peatland forests and watercourses need time and space to recover and for natural dynamics to return. The areas remain under observation – after all, the measures carried out are intended to be permanent – and the long-term development of the habitats documented. The trial grazing programme on the Ruckowitzschachten will continue together with its monitoring and the trial is due to be extended to include a pasture on the Hochschachten.



In addition, the National Park Administration will, naturally, continue its commitment to conservation and communications relating to Natura 2000. Particularly pleasing news: From August 2018, the project "LIFE for MIREs" is joining forces with the participating Šumava National Park, Bund Naturschutz in Bayern e.V., University of South Bohemia in České Budějovice and the Bavarian Forest National Park to ensure that protection for bogs will continue on a cross-border basis moving forward.

## Our heartfelt thanks!

The success of this project was only possible with the active support and commitment of a wide range of people.

### We would particularly like to thank:

The steering committee:

- Lower conservation authorities from Freyung-Grafenau and Regen administrative districts
- Higher conservation authorities at the Government of Lower Bavaria
- Bavarian State Ministry for the Environment and Consumer Protection



The working group:

- The Office for Food, Agriculture and Forestry in Regen, Forestry department
- Bayerischer Bauernverband
- Bayerischer Wald-Verein e.V.
- Bavarian State Office for Monument Preservation
- Bund Naturschutz in Bayern e.V.
- Zwiesel Mountain Rescue
- Lower Bavaria District, Special Advisory for Fishing
- Bayerisch Eisenstein Municipality
- Frauenau Municipality
- Hohenau Municipality
- Lindberg Municipality
- Mauth-Finsterau Municipality
- Neuschönau Municipality
- Spiegelau Municipality
- Freyung Municipality
- Grafenau Municipality
- Zwiesel Municipality
- St. Oswald-Riedlhütte Municipality
- County Fisheries Association Grafenau
- Landesbund für Vogelschutz in Bayern e.V.
- Cham County Authorities
- Freyung-Grafenau County Authorities
- Regen County Authorities
- Šumava National Park
- Bavarian Forest Nature Park
- Pro Nationalpark Freyung-Grafenau e.V.
- Pro Nationalpark zur Förderung des Zwieseler Winkels e.V.
- Government of Lower Bavaria
- State Building Authority Passau
- Water Authority Deggendorf

The European Union and the Bavarian Fund for Nature Conservation for the financing

The monitoring team for the uncomplicated and productive cooperation

The neighbours and conservation associations for their cooperation

All businesses and volunteers who were involved in implementing the measures

All involved employees at the National Park Administration for their tireless support





## Imprint

Publisher: Nationalparkverwaltung Bayerischer Wald  
Freyunger Straße 2  
94481 Grafenau

Internet: [www.nationalpark-bayerischer-wald.de](http://www.nationalpark-bayerischer-wald.de)  
E-Mail: [poststelle@npv-bw.bayern.de](mailto:poststelle@npv-bw.bayern.de)

Editors: Claudia Schmidt, Jochen Linner, Gregor Wolf

Typesetting/layout: Atelier Václav Hřaba, Prag

Corporate design: Atelier Mautner, Grafenau

Photos: Daniela Blöching (p. 3), Bragabe (p. 19), Michael Andreas Fritze (p. 8), Harald Grunwald (p. 14, 26), Karl Klostermann (p. 18), Franz Leibl (p. 4), Günther Moser (p. 25), Elke Ohland (p. 22), Julia Piser (p. 19), Claudia Schmidt (p. 1, 8, 10, 11, 12, 13, 15, 17, 22, 24), Rudolf Schmidt (p. 15), Ulrike Selig (p. 1, 21), Rainer Simonis (p. 6, 13, 15, 18, 19, 26), Simon Thorn (p. 18), Jan Vančura (p. 13, 14, 15, 16, 18, 22, 25), Gregor Wolf (p. 20)

Translation: Rowan Sewell ([www.rowansewell.com](http://www.rowansewell.com))

Printing: Agentur SSL, Grafenau

Correct as of: August 2018

© Nationalparkverwaltung Bayerischer Wald, all rights reserved

This publication may not be used by parties or by campaigners or election supporters for election advertising purposes for a period of five months prior to an election. This applies to state, federal, local and European elections. During this time, it is particularly improper to distribute this information at election events, at information stands belonging to political parties or to post, print and hang up party-political information or advertising material. It is also prohibited to pass this information on to third parties for the purpose of election advertising.

Even without any relation to a forthcoming election, the publication may not be used in a manner that could be understood as if the government would take sides in favour of individual political groups. The parties are, however, permitted to use the publication to inform their own members. In the case of journalistic use – including in parts – please indicate the source and send us a specimen copy.

This publication is protected by copyright. All rights reserved. This publication is provided free of charge. Any request for payment in return for this publication is therefore prohibited.



BAYERN | DIREKT is your direct line of communication with the Bavarian State Government. Call 089 122220 or e-mail us at [direkt@bayern.de](mailto:direkt@bayern.de) for information and brochures, news on the latest topics and internet resources, as well as information on authorities, responsible departments and contacts at the Bavarian State Government.



# NATIONALPARK Bayerischer Wald

## *THE BAVARIAN FOREST NATIONAL PARK ...*



... holds the European Diploma (since 1986)



... holds certification as a Transboundary Park together with Šumava National Park (since 2009)



... is an important component of the European Natura 2000 network

Nationale  
Naturlandschaften



... holds membership to EUROPARC Deutschland  
Umbrella organisation of Germany's major protected areas