Interreg CENTRAL EUROPE

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HealthyForestRegions

Interpretation Plan for *Healthy Forest Regions*

Strategic approach for communicating the value of Healthy Forests and the ecosystem services they provide for human health and well-being

Output 1.1 Interpretation Plan for Healthy Forest Regions

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A. Content

B. Acronyms

AOPK	Agency of Nature and Landscape Protection
BR	Biosphere Reserve
CE	Central Europe
ES	Ecosystem Services
FMU	Forest management unit
HFR	Healthy Forest Region
IP	Interpretation Plan
IUCN	International Union for Conservation of Nature
m.a.s.l.	metres above sea level
MAB	Man and Biosphere, UNESCO programme
NNR	National Nature Reserve
NP	National Park
NUTS	Nomenclature of Units for Territorial Statistics
PA	Protected area
PI	Public Institution
PLA	Protected Landscape Area
SNR	Strict nature reserve
UNESCO	United Nations Educational, Scientific and Cultural Organization

C. Summary

The *Interpretation Plan (IP) for Healthy Forest Regions* is a joint strategic approach for communicating the value of healthy forests and their contributions to human health and well-being. It was developed in the framework of the Interreg CENTRAL EUROPE (CE) project "*HealthyForestRegions: Supporting Healthy Forest ecosystems for human well-being in forest Regions*". The background and network of the project partners is based on the UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe".

The involved project partners of six regions in Central Europe developed the concept of "Healthy Forest Regions" which are regions committed to the promotion and conservation of healthy, functional forests to assure the provision of forest ecosystem services that are essential for human health and well-being. The present ***Interpretation Plan for Healthy Forest Regions*** **(IP)** was developed to make this concept tangible in practise. By understanding and experiencing the crucial role healthy forests play for human health and well-being, people are more likely to support conservation efforts and sustainable practices. Based on the principles of Heritage Interpretation, this IP aims to:

- ✓ raise nature awareness,
- ✓ promote conservation,
- ✓ encourage sustainable practices,
- ✓ foster connection with nature,
- ✓ support research and monitoring,
- ✓ reduce human impact,
- ✓ provide economic incentives and
- ✓ create community engagement.

In general, an Interpretation Plan (IP) consists of three main parts: (I) an analytical part, (II) a planning part and (III) an application part. This general structure of interpretive planning is also reflected in the present Interpretation Plan for Healthy Forest Regions:

Chapter 1 and 2 compose the analytical part providing a presentation of the involved project regions as case studies, an introduction to the approach of *Heritage Interpretation* and a definition of *Healthy Forest Regions*.

The planning part (chapter 3) contains jointly developed key messages for communicating the value of healthy forests and their ecosystem services contributing to human health and well-being (3.1 WHAT to interpret?), the objectives of interpreting Healthy Forest Regions (3.2 WHY to interpret?), the identification of the relevant target groups (3.3 WHO to interpret to?) as well as a description of appropriate interpretation tools, formats and methods (3.4 HOW to interpret?).

In the application part (chapter 4), the pilot activities implemented within the HFR project are shortly described as examples for implementing the *Interpretation Plan for Healthy Forest Regions* in practice.

The *Interpretation Plan for Healthy Forest Regions* is the first interpretation plan that was not developed for a specific locality, but for a regional concept: the concept of Healthy Forest Regions. This was, at the same time, the biggest challenge as Heritage Interpretation is commonly used as an educational approach to be applied to a specific locality.

The *Interpretation Plan for Healthy Forest Regions* provides a common baseline for communicating the value of healthy, functional forests and their ES contributing to human health and well-being. However, to

foster a deeper understanding and appreciation of forests through interpretive activities, the interdependency between forest health and people's health needs to be further broken down to a specific locality or phenomenon in nature to make it tangible in practice.

D. Interpretation Plan for Healthy Forest Regions

1. Introduction

The *Interpretation Plan (IP) for Healthy Forest Regions* is a joint strategic approach for communicating the value of healthy forests and their contributions to human health and well-being. It was developed in the framework of the Interreg CENTRAL EUROPE (CE) project "*HealthyForestRegions: Supporting Healthy Forest ecosystems for human well-being in forest Regions*" and forms one of the project's outputs of the work package "P*romotion of forest ecosystem-based sustainable regional development for human wellbeing in HFR" (Output 1.1 Interpretation Plan for Healthy Forest Regions).*

1.1. Background

The Interreg CENTRAL EUROPE (CE) project *"Healthy Forest Regions: Supporting Healthy Forest ecosystems for human well-being in forest Regions"* tackles the CE-wide challenge of declining forest health ecosystem-specific biodiversity loss resulting from unsustainable forest management practices such as industrial timber harvesting, over-thinning, opening of stands and crown cover, clearing of calamity sites, soil damage or homogenous forest structures. This decline of forest health is being intensified by the effects of accelerating climate change (e.g. extreme weather conditions like heat waves and heavy rains leading to droughts and floods, pests, etc.), which further reduces the adaptive capacity and resilience of forests towards these climate change impacts as well as their ability to provide essential (regulating) ecosystem services (ES) for human health and well-being.

Against this background, one of the project's main objectives is to enable stakeholders, decision-makers and the local population to safeguard forest health[1] in forest regions by raising awareness for the value of healthy, functional forests and the ecosystem services they provide for human health and well-being. For this purpose, in the project's work package *"Promotion of forest ecosystem-based sustainable regional development for human well-being in Healthy Forest Regions",* a variety of communication and educational activities are being implemented. The objective of these activities is to embed the importance of healthy forest ecosystems for human health and well-being into sustainable regional development and to create an (inter-)regional identity of "*Healthy Forest Regions*" in the project target regions.

The present **Interpretation Plan for Healthy Forest Regions** addresses the territorial challenges of declining forest ecosystem health providing a general strategic approach for communicating the value of healthy, functional forests and their ES contributing to human health and well-being. The objective is to foster a deeper understanding and appreciation of forests through interpretive activities and to disseminate the concept of "Healthy Forest Regions" making it tangible for various audiences (residents, visitors, policymakers etc.).

[1] A definition of forest health is provided in chapter 2.2

1.2. Project Regions

In the Interreg CENTRAL EUROPE (CE) project "*Healthy Forest Regions: Supporting Healthy Forest ecosystems for human well-being in forest Regions*", nine project partners from six project regions are cooperating to transform their regions into *Healthy Forest Regions* and be a blueprint for other regions to follow:

PROJECT REGION:	*PROJECT PARTNERS:*
ANGERMÜNDE (DE)	*Eberswalde University for Sustainable Development (HNEE)* *Angermünde City Administration (AC)*
NATURE AND GEOPARK STYRIAN EISENWURZEN (AT)	*Nature and Geopark Styrian Eisenwurzen (NUP Eisenwurzen)*
POLONINY (SK)	*National Forest Centre (NLC)*
KOČEVSKO(SI)	*Slovenia Forest Service (SFS)* *Municipality of Kočevje (MK)*
JIZERA MOUNTAINS BEECH FORESTS (CZ)	*LAG Frýdlantsko (MASiF)* *Czech University of Life Sciences Prague (CZU)*
VELEBIT MOUNTAIN (HR)	*Public Institution Paklenica National Park (PNP PI)*

Table 1: Project partners and regions

Figure 1: *Project partners at the project kick-off meeting in Angermünde, May 2023 (Source: HFR Project)*

All project target regions are situated in the landscape context of the transnational UNESCO World Heritage (WH) site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" providing outstanding examples of healthy beech forest in Europe. The objective of the HFR project is to thrive on the benefits that healthy forests provide embedding them into *Healthy Forest Regions* by supporting healthy forest ecosystems for human well-being in the project target regions.

Figure 2: *UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" as common background and network of the HFR project partners (Source: HFR Project)*

In the following, the involved project target regions will be shortly presented. Some of the project regions have already geographically defined the *Healthy Forest Region* (HFR) they pursue to develop. In these cases, the HFR coincides with already existing borders, e.g. the borders of an existing Biosphere Reserve in the region or other administratively defined borders. In other project regions, the HFR has not been defined yet. In these cases, the geographical determination of the HFR is still being discussed with relevant stakeholders. The objective is that by the end of the project, all HFR are defined – geographically and content-wise – for all project target regions.

1.2.1. Germany: Angermünde

Angermünde is located in one of the most sparsely populated areas of Germany, about 85 km northeast of the federal capital Berlin, in the state of Brandenburg in the Uckermark district. Angermünde consists of the core city Angermünde and 23 districts. In terms of total area, it is one of the largest towns in Germany. However, in terms of population, it is a small city with approx. 15,000 inhabitants, of which nearly 60% live in the core town. The population development has remained stable and is even slightly increasing due to the growth dynamics in the Berlin area. However, ageing among the population might still become a problem in the future.

Figure 3: *The varied landscape of Angermünde (Source: Angermünde City Administration)*

Angermünde is embedded in a unique landscape shaped by the Ice Age, which is evident in the interplay between open and closed landscapes, gentle topographic movements and an attractive lake scenery. The diversity of agricultural land (about ⅔), forested areas (about ¼), settlement areas, and numerous bodies of water (especially lakes) creates a varied landscape. Of particular relevance with regard to landscape development and landscape protection are the nature and landscape conservation areas. Large parts of Angermünde lie within the Schorfheide-Chorin Biosphere Reserve[2], which includes the Grumsin beech forest[3], designated as a component part of the UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" since 2011.

Figure 4: *UNESCO World Heritage Beech Forest Grumsin in Angermünde (Source: Martin Flade)*

[2] https://www.schorfheide-chorin-biosphaerenreservat.de/

[3] https://www.weltnaturerbe-buchenwaelder.de/welterbe-buchenwaelder/deutschland/grumsin

The south-eastern districts of Stolpe, Gellmersdorf and Crussow lie entirely or partially within the designated area of the Lower Oder Valley National Park[4]. These protected areas primarily serve to preserve the landscape, while also acting as important economic drivers for Angermünde through tourism. Since 2010, Angermünde is a federally declared resort town. The high landscape quality does not only attract tourists, but positively impacts Angermünde as a residential location, making it increasingly attractive for new residents looking to relocate to rural areas. Parts of the Angermünde landscape are used for energy production. In the eastern part of the city, energy is primarily generated through wind turbines. Additionally, there is a special area for solar energy at the southern end of the city centre, as well as a planned energy production area in the north.

For the future development of Angermünde, the challenge is to achieve a sustainable balance between nature conservation, tourism and economic land use (agriculture, forestry, energy production). In its Integrated Town Development Concept (INSEK), Angermünde, along with the associated districts and landscapes, defines a sustainable and future-proof development as a key objective. A careful approach to nature and the landscape in the context of environmental and climate protection is recognized as a high priority. Furthermore, it is important to shape developments in the areas of tourism, economy, mobility, and settlement structure in a resource-efficient, integrated, and forward-looking way. The greatest framework for the sustainable development of Angermünde is provided by the Sustainable Development Goals (SDGs) as well as various adaptations to the local and regional context. The development of a "Healthy Forest Region Angermünde" is one approach Angermünde pursues for the sustainable development of the region. According to this approach, Angermünde wants to safeguard healthy forest ecosystems as they provide crucial ecosystem services that are in demand today and in the future more than ever. The definition and declaration of the *Healthy Forest Region Angermünde* is still being discussed among stakeholders and will be one result of the Interreg project "*HealthyForestRegions*".

[4] https://www.nationalpark-unteres-odertal.eu/de/

1.2.2. Austria: Nature- and Geopark Styrian Eisenwurzen

The Nature- and Geopark Styrian Eisenwurzen, established in 1996, spans 633 km² across the borders of Upper and Lower Austria. It encompasses four municipalities: Altenmarkt, Landl, St. Gallen, and Wildalpen, and is part of the Gesäuse tourism region. In 2002, the park was recognized as a European Geopark, in 2015 it became a UNESCO Global Geopark. Visitors often describe the area as "wildly romantic", with stunning landscapes that include gorges and river valleys along the Enns and Salza rivers. The park's natural diversity features mixed beech forests, alpine meadows, and traditional orchards, all of which are protected under various ecological initiatives.

Figure 5: *The varied landscape of Styrian Eisenwurzen (Source: Peterherr NUP EIS)*

The Nature- and Geopark's mission focuses on nature and geological conservation, sustainable regional development, ecological education, and sustainable tourism, all in line with broader climate adaptation strategies to protect its unique cultural and natural landscapes. It is home to approximately 5,595 residents, spread across the above mentioned. The population density is low, typical for rural areas with mountainous

Figure 6: *Map of the Nature- and Geopark Styrian Eisenwurzen (Source: Natur- und Geopark Steirische Eisenwurzen)*

terrain, and the economy is deeply intertwined with the natural and cultural landscape of the region. The relatively low population density contributes to the preservation of biodiversity and natural habitats.

However, the population is aging, and younger generations often move to urban areas for education and employment, which presents challenges for municipalities and local economies.

The local economy relies on agriculture, forestry, tourism, and small-scale industries, with traditional land use practices, such as livestock farming on alpine pastures and orchard cultivation, playing a central role in shaping the region's economy and cultural identity. Sustainable farming, especially in the maintenance of *Streuobstwiesen* (traditional orchards), is encouraged by the Nature and Geopark's administration, contributing to local biodiversity and the production of high-quality regional products like apples, pears, and regional specialties. Forestry is another key economic sector, supported by both public and private landowners such as the Austrian Federal Forests and Styrian State Forests. The park's administration promotes sustainable forestry practices, addressing climate-related challenges like bark beetle infestations and storm damage. Tourism is increasingly important for the region, with the park's UNESCO Global Geopark status attracting eco-tourists interested in its natural beauty. Popular activities include hiking, rafting on the Salza River, and geological tours. The park has developed educational trails, geo-rafting tours, and exhibitions to promote sustainable tourism while educating visitors about its unique natural and geological features.

Given the park's forest-rich landscape and its long-standing conservation efforts, it was logical to designate the entire Nature- and Geopark Steirische Eisenwurzen as a Healthy Forest Region, further enhancing the region's commitment to sustainable land and forest management. This new recognition adds to the many accolades of this ecologically valuable area.

Figure 7: *Environmental education activities in Styrian Eisenwurzen (Source: B. Nachbagauer - NUP EIS)*

1.2.3. Slovakia: Poloniny

The Healthy Forest Region (HFR) Poloniny is located in the north-eastern corner of Slovakia, bordering Poland and Ukraine. It lies within the Poloniny National Park and overlaps with several national and European protected areas. The region encompasses four forest management units: LHC Starina, LHC Topoľa, LHC Zboj, and LHC Ulič, covering a total area of approximately 459 km^2. Seventeen villages, home to about 7,000 residents, are part of this region. The HFR Poloniny is characterized by a forest cover of about 70%.

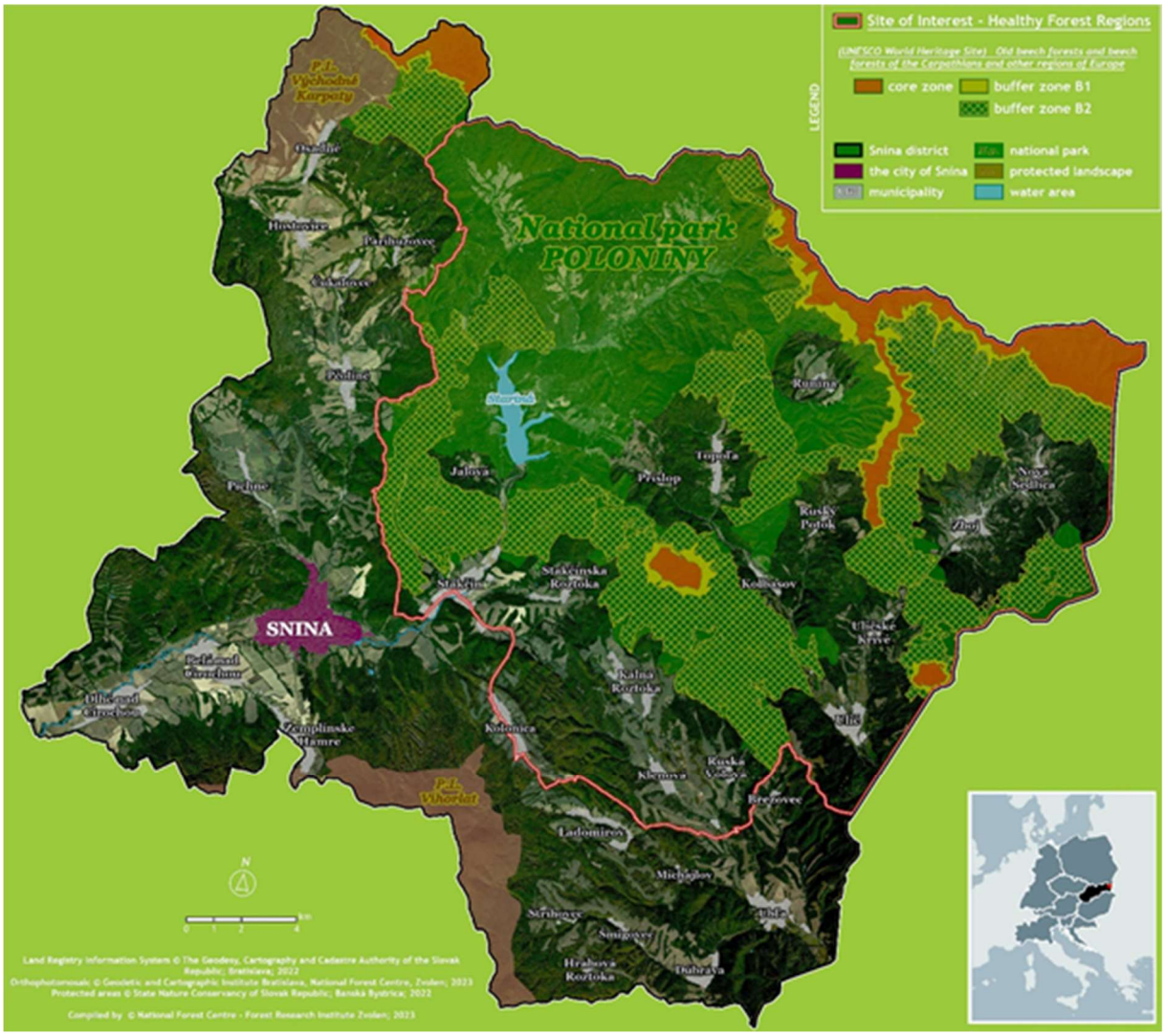

Figure 8: *Map of HFR Poloniny in Slovakia (Source: National Forest Centre)*

A significant part of the HFR Poloniny consists of the Poloniny National Park, established on 1 October 1997 and located in the Bukovské vrchy mountain range in the Eastern Carpathians. It covers a protected area of 298 km^2, with an additional buffer zone of 110 km^2. Some areas of the National Park form part of the UNESCO World Heritage site, “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe”: The primeval beech forests of Havešová, Stužica, and Rožok, all located in Bukovské vrchy, were designated as World Heritage sites by UNESCO on 28 June 2007, due to their intact ecological processes and patterns. Together with other Slovak sites in Vihorlat and several Ukrainian locations, they form part of the larger Ancient and Primeval Beech Forests network. To protect these precious ecosystems, only one of them, the beech forest Stužica, is accessible for the public.

Poloniny National Park is situated in the Snina District of the Prešov Region and is adjacent to Poland’s Bieszczady National Park. Both parks are part of the East Carpathian Biosphere Reserve. The National Park’s highest point is at 1,208 m.a.s.l., near the summit of Mount Kremenec, where the borders of Slovakia, Poland, and Ukraine meet. Poloniny National Park is the easternmost and least populated area of Slovakia. It is also recognized as a "Dark Sky Park," the first such designation in Slovakia, declared as such during the International Year of Biodiversity in 2010.

Forests cover approximately 80% of the National Park, predominantly beech and beech-fir forests. Poloniny National Park has the highest concentration of old-growth forests in Slovakia, which are protected as national nature reserves. The park also features meadows, locally known as "poloniny," which dot the ridgelines of the Bukovské vrchy. Numerous species of flora and fauna, some rare and endemic, thrive in these habitats. The park is home to around 800 fungi species, 100 lichens, and about 5,981 invertebrate species, including 91 mollusks, 1,472 true bugs, 819 butterflies, and 403 spiders. It also hosts 294 species of vertebrates, including 13 amphibians, 8 reptiles, 198 birds, and 55 mammals, such as the Eurasian lynx, brown bear, and grey wolf. Approximately 1,000 species of vascular plants have been recorded, many of which are endangered or protected. A small herd of European bison (*Bison bonasus*) was reintroduced to the park in 2004.

Figure 9: *Two members of the wisent herd in a meadow, locally known as "poloniny" (Source: Ing. Martina Vlasáková)*

Poloniny National Park is open year-round, offering a range of outdoor activities, from summer hiking to winter cross-country skiing. Besides mountain trails, there is also a route that connects several notable wooden churches from the 18th century, located in Topoľa, Ruský Potok, and Uličské Krivé.

Figure 10: *Wooden church in Uličské Krivé (Source: Ing. Mária Gabrišová)*

In 1992/93, Poloniny National Park, together with adjacent protected areas in Poland, became part of the Eastern Carpathian Biosphere Reserve under UNESCO's "Man and the Biosphere Programme." In 1998, the reserve expanded to include protected areas in Ukraine, forming the world's first tri-national biosphere reserve[5]. That same year, Poloniny National Park received the prestigious European Diploma for Protected Areas from the Committee of Ministers of the Council of Europe[6].

Today, forest management, landscape planning, and nature protection in the region are regulated by state laws, ministries, regional authorities, and professional organizations. Local and regional development is also supported by local self-governance and community involvement.

[5] https://www.nppoloniny.sk/mbr-vychodne-karpaty/

[6] https://www.coe.int/en/web/bernconvention/european-diploma-for-protected-areas

1.2.4. Slovenia: Kočevsko

Figure 11: *Kočevsko (Source: Katja Konečnik)*

The *Healthy Forest Region Kočevsko* is situated in the south-eastern part of Slovenia. The area lies between the mountains Goteniški Snežnik, Stojna and Rog, which belong to the most northern part of the Dinaridi mountain range, and the canyon of the river Kolpa, which forms *HFR Kočevsko's* southern border.

The size of Healthy Forest Region Kočevsko is 650 km^2 with a forest cover of 83% of the total area.

The area of Kočevsko is among the most naturally preserved regions in Slovenia. A long-lasting history of vast uninhabited, forest-covered space spreading from the canyon of the river Kolpa in the south to Ribnica town in the north was broken by colonisation in the 14th century. Farming and settlements begun in the lowland, limited by the access to surface water or springs in a water-poor limestone country, leaving higher lying and hard to approach forests on mountain ridges untouched by human hand. Although the commercial exploitation of forest belonging to the count Auersperg begun in the second half of the 19th century, the decisions in the first forest management plans, signed by Dr. Hufnagel, show a significantly different approach to forest management from the clear-cuttings that were prevailing in other parts of Europe at that time. A basic version of selective cutting was established and a care for continuous forest cover of limestone ground was ordered. With remarks in the first forest management plan in 1892, some parts of the forests were preserved as virgin forest and any use of them was excluded.

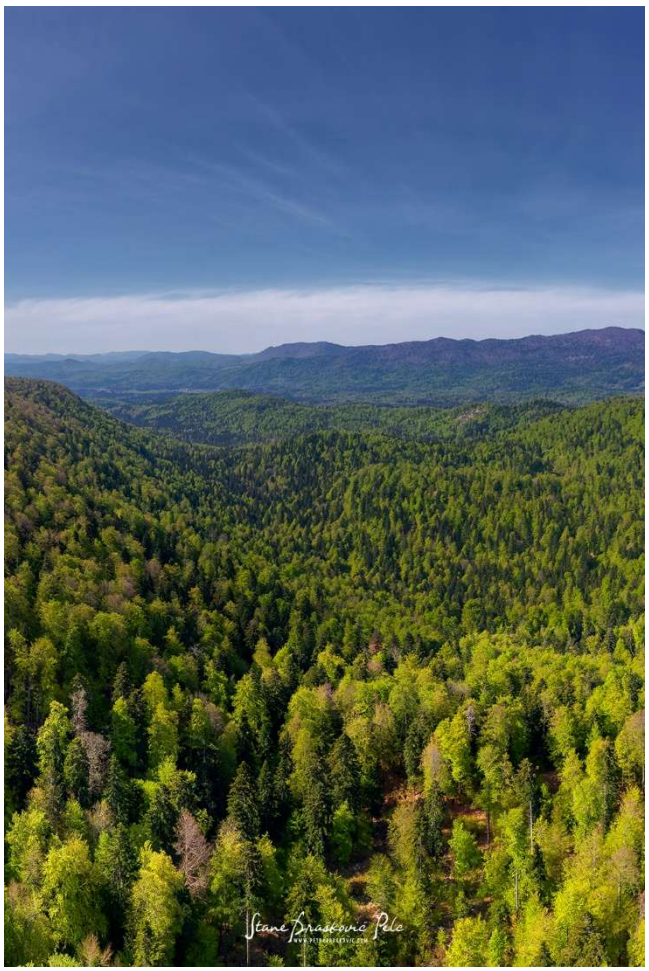

Figure 12: *HFR Kočevsko (Source: Stane Draškovič Pelc, SFS)*

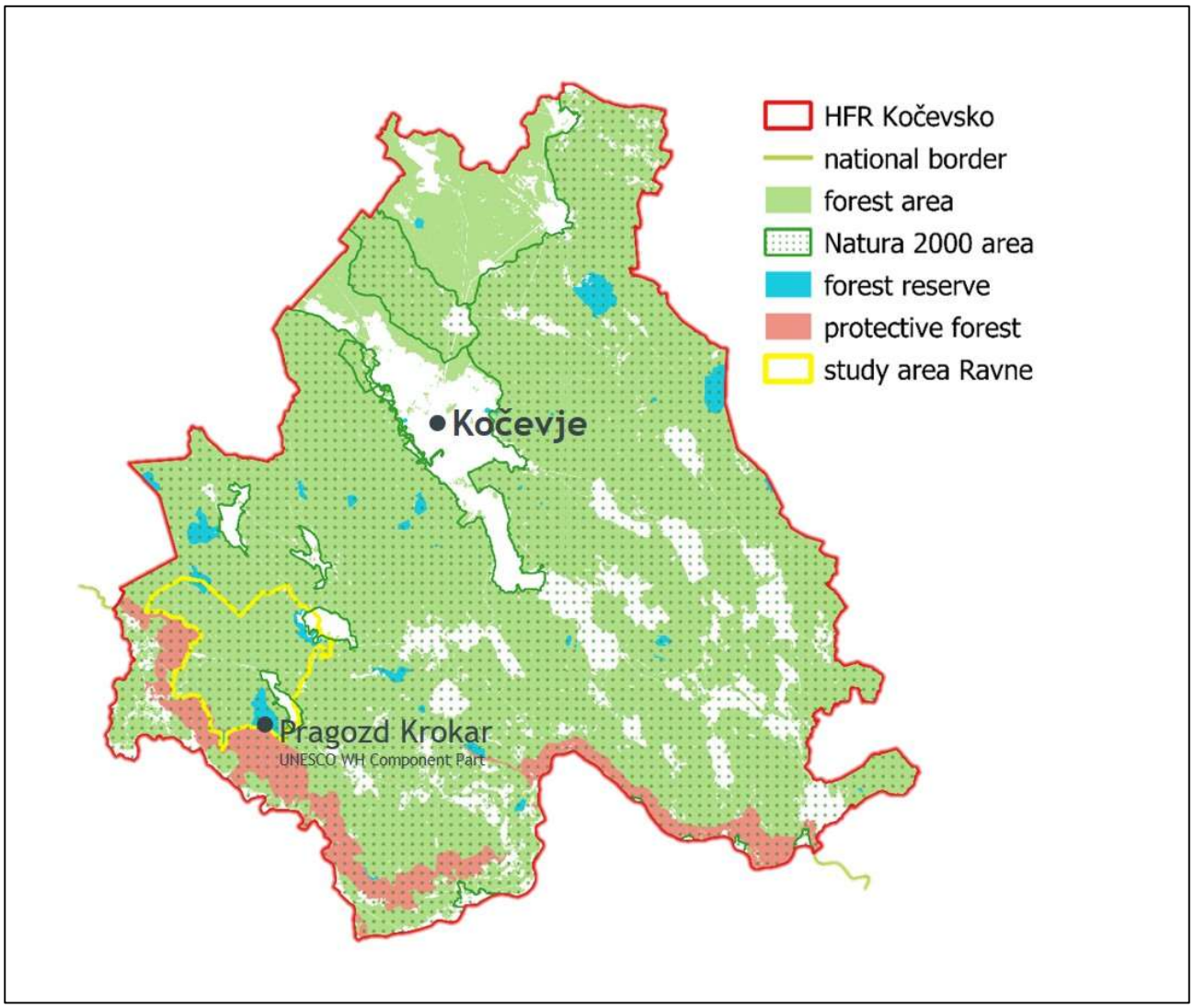

Figure 13: *Area of HFR Kočevsko, Slovenia, showing forest coverage, Natura 2000 areas, forest reserves and protective forests (Source: Slovenia Forest Service)*

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Most of the villages in the area were abandoned, burned down and ruined in World War II and never came to life again. 500 years of human colonisation were gradually but relentlessly erased by scrub and woodland. A process of succession allowed a different mix of species to thrive, enriching the biodiversity of the region.

With this legacy, in the HFR Kočevsko, the management of the forests, the prevailing ecosystem of the region, evolved into sustainable, multi-purpose and close-to-nature forest management, based on the same principles as in the start of exploitation, strengthened through years of experience.

The nature in the HFR Kočevsko is predominantly marked by continuous beech and beech-fir forests, optimal growth for Dinaric Mountain range. They are home and base of many typical Dinaric species of plants,

animals and communities – among them all European large carnivores (brown bear, wolf and lynx), many Natura 2000 species of birds, insects and communities.

Most preserved and pristine parts are virgin forests (144,56 ha), with the Virgin Forest Krokar as a component part of the UNESCO World Heritage site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe".

In the HFR Kočevsko, 1,6% (1.238,78 ha) of the area is protected as forest reserves, hereby excluded of exploitation, with some exceptions for research and educational use. The access to them is only allowed on marked footpaths. 77% of the HFR Kočevsko area form part of the Natura 2000 network. Besides most of the forest areas, some parts of meadows in the high Karst area, the riverbanks of the Rinža and Kolpa rivers and slopes of the Kolpa canyon are included. Forests on steep slopes of the Kolpa canyon are also specially managed as protective forests.

The majority of the forest in the HFR Kočevsko at the same time with the production of quality wood fulfil also other important ecological and social functions.

There are 16,634 inhabitants in the region. Almost half of the population (8,126) resides in the city of Kočevje, the other half is scattered in around 150 settlements. Kočevje is the capital of the municipality Kočevje. Besides the municipality Kočevje, which is the biggest municipality in Slovenia in terms of total area, the HFR Kočevsko also comprises the municipalities Osilnica and Kostel, who are among the smallest municipalities in Slovenia.

The cultural landscape presents 17% of the HFR Kočevsko area, that includes urban areas (8% of HFR Kočevsko) and farmland (9% of the HFR Kočevsko area). Most of the farmland is used as grassland or meadows (87,4%), some as fields (11,4%) and a few for permanent plantations (1,3%).

A special feature in the landscape are the areas of the destroyed villages during World War II, today almost fully covered by scrubs and in some places already by forests. They are grounds, where nature shows its power by conquering back its former places.

1.2.5. Czech Republic: Jizera Mountains Beech Forest

Figure 14: *Geomorphology of Jizera Mts. Beech Forest (Source: Jiří Hušek)*

The Healthy Forest Region Jizera Mountains Beech Forest is located at the northern slopes of Jizerské hory/Jizera Mountains (Protected Landscape Area) at the north spurs of Czech Republic. Jizera Mts. Beech Forest is the largest complex of close-to-nature forest with a predominance of beech in Bohemia, which is also linked to a unique mountain relief with numerous outcrops of granite bedrock.

The Jizera Mountains Beech Forest UNESCO site with its core (445 ha) and buffer zone (2279 ha) forms part of the core area of the Jizera Mts. Beech Forest National Nature Reserve (NNR), and, thus, has been provided with the strictest protection regime pursuant to the national nature legislation. In addition, it also is protected under the European Union legislation, namely the Birds and Habitats Directive as an EU Natura 2000 ecological network site.

The nature reserve covers the territory of 5 small towns and villages with 15,500 thousand inhabitants and low population density (95 inh. /km^2). The regional centre Liberec (100,000 inhabitants) is accessible in 30 minutes by car and the capital, Prague, in 1,5 hours.

Thanks to its border location, steep slopes and a relatively cold microclimate, the northern slopes of the Jizera Mts. were not favourable for human settlement and agriculture. Jizera Mts. Beech Forest is one of a few parts of the Jizera Mts. which has not been heavily transformed by humans. Since 1960, selective logging has been applied there, and in the NNR the forest has not been managed, having been left to spontaneous development (the buffer zone has been slightly managed e.g. by selective logging and some deadwood removal). The protective measures are applied through the NNR´s management plan implementation in these fields: forest management, water management, areas outside forest management, wild flora and fauna management and abiotic environment management. The site is managed by the Nature Conservation

Agency of Czech Republic, the Jizera Mts. Protected Landscape Area (PLA) Administration, based in Liberec, in close cooperation with the Forest of the Czech Republic State Enterprise. Research is provided by the universities (Czech University of Life Sciences, Charles University Prague, Mendel University Brno), museums (North Bohemian Museum Liberec) and expert societies (Czech Society for Ornithology). The professional staff of the PLA Administration is complemented with five nature guard-rangers (acting in the whole PLA Jizera Mts. area). Citizens, including youth, participate as volunteers through various non-profit organizations involved in management of the buffer zone and public awareness.

After UNESCO enlisting, the group of local stakeholders started to meet to discuss and formulate the interpretive plan as a tool to balance the interests of various actors in nature protection, territorial development and the careful use of natural sites for the development of tourism. The following main topics to address visitors and interpret the unique values of the area have been identified:

Geology and geomorphology, flora and fauna: In contrast to other beech-dominated stands in the sub-Atlantic-Hercynian area of forest beech distribution, the Jizera mountain beeches developed into granite and granodiorite. Although acidophilic, flowering and mountain maple beeches and scree forests occupy a full 94.5% of the area, we can also find significant geomorphological formations in it, created on steep slopes by weathering and erosion. The forest growths are structurally heterogeneous, harbouring many large and old trees, multi-layered canopies and a high variation in tree size and age. The flagship species occurring here include *Lilium martagon*, *Dactylorhiza majalis*, *Astacus fluviatilis*, *Salamandra salamandra*, *Ciconia nigra* and *Aegolius funereus*. The wolf and probably the lynx are gradually returning.

Water: The Jizera Mountains belong to the areas with the richest rainfall in Czech Republic. Ecologically stable forests are of critical importance for retaining the water in the landscape. They are a source of drinking water for Frýdlantsko – the region at the bottom of the mountains. The Smědá River and its tributaries, mountain streams from the Baltic Sea basin, fall rapidly from the northern slopes, and during persistent rains, floods occur in the foothill villages and lowland parts of the Frýdlant Region. The state of the forest in the mountainous part of the territory clearly affects the safety of more distant communities.

Figure 15: *Mountain stream in beech forest (Tomáš Exner)*

Clam-Gallas Game Reserve: In the middle of the 19th century, the noble family of owners of the estate built the game reserve, which spread over 5,560 hectares and consisted of approximately 11,000 stone pillars made of local granite, wooden fence, over 50 gates and another 50 tiny gates. Today, small parts of the fencing and the "deer jump" have been restored as an example of the historic game reserve.

German history of the area: In the 14th century, German settlers were invited to the Jizera Mountains by Přemysl Otakar II. to settle and farm in the border forest. Settlers penetrated the mountains through the valleys of rivers and streams, founded pastoral and craft villages and towns, built glassworks and ceramic workshops, woodworking saws, paper mills, and textile factories. Their descendants lived here for more than 700 years but were expelled in 1945. The new arrivals then settled the villages and the countryside without the necessary knowledge and relationships. The original inhabitants are reminded of local names, monuments and small sacral monuments as well as the specific folk architecture of timbered houses.

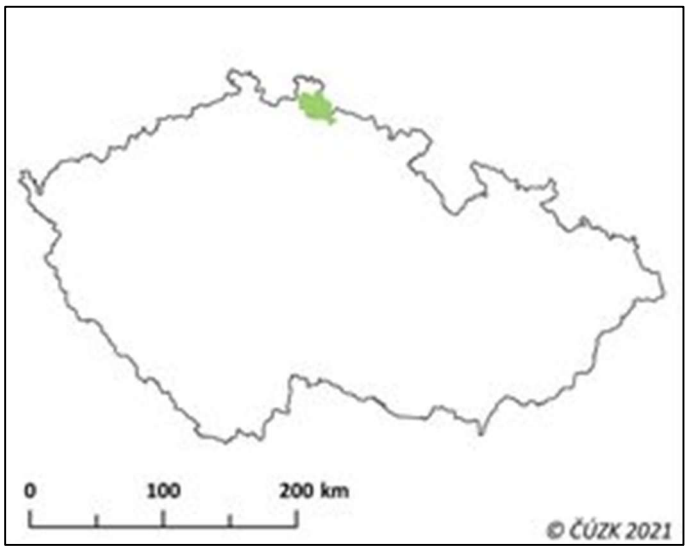

Figure 16: *Location of the Protected landscape area Jizera Mts. in Czech Republic (Source: AOPK)*

Figure 17: *Location of the NNR Jizera Mts. Beech Forest in PLA Jizera Mts. (Source: AOPK)*

1.2.6. Croatia: Velebit Mountain

Figure 18: *Velebit Mountain (Source: Mario Jurina)*

The entire area of the Velebit mountain represents the *Healthy Forest Region Velebit Mountain* in Croatia, which includes the Velebit Nature Park and the two National Parks Paklenica and Northern Velebit.

Velebit is one of the most prominent natural areas in the Balkans situated at the Adriatic coast of Croatia. The area is characterized by a high level of biodiversity in forests, highland subalpine meadows and dry and mountain grasslands. With the altitude ranging from 0 to 1757 m.a.s.l., the area represents a 145 km long and 10-30 km wide stretch of Dinaric karst landscape.

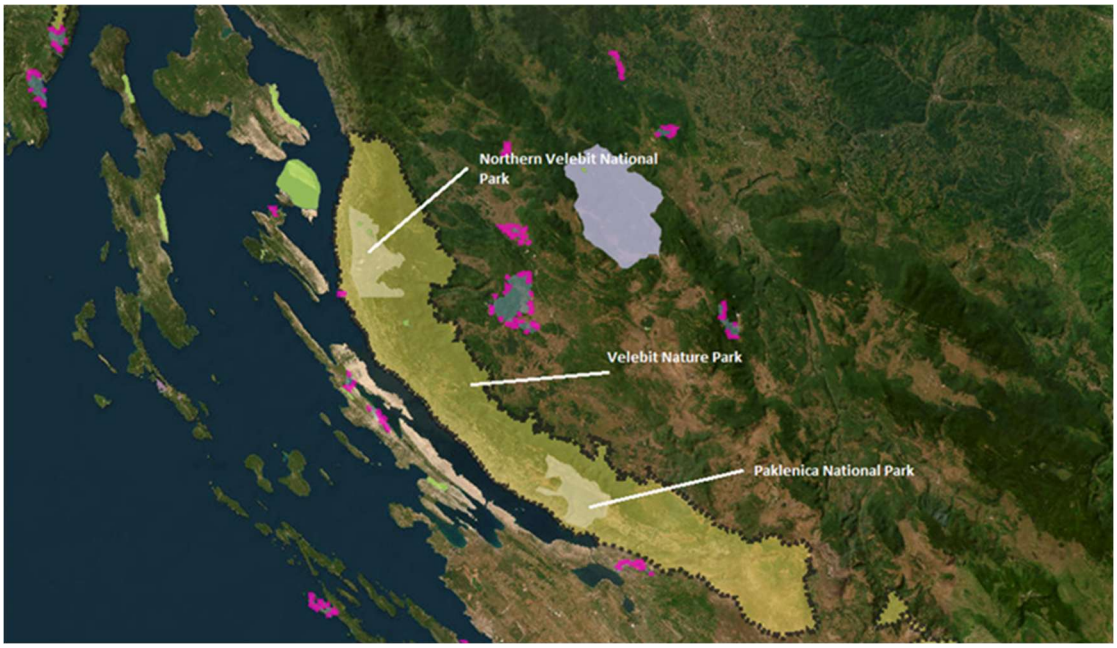

Figure 19: *Area of HFR Velebit Mountain (Source: Project HFR)*

In addition, the boundaries between habitats are not clearly delineated, but merge into one another in transitional areas, which are often the richest in life forms. The largest part of Velebit is covered by forest vegetation.

Velebit is the largest Croatian mountain, 145 km long and protected nationally on several levels. In its whole length, it is protected as a Nature Park (total surface of 203,551 hectares) which corresponds to the IUCN management category V. Higher level of national protection is designated to the areas of the Northern Velebit National Park (total surface of 11,100 hectares) and the Paklenica National Park (total surface of 9,500 hectares) corresponding to the IUCN management category II. Under the management of the Northern Velebit National Park, there is a Strict Nature Reserve - Rožanski i Hajdučki kukovi - corresponding to the IUCN Management category Ia.

Within the UNESCO's programme Man and Biosphere (MAB), the Velebit Mountain was included in the World Network of Biosphere Reserves (BR) in 1978.

The Velebit Mountain BR, which also represents the area of the Healthy Forest Region Velebit Mountain, is managed by a Coordinating Council consisting of representatives from the Public Institutions (PIs) of the Velebit Nature Park, the Paklenica National Park and the Northern Velebit Nature Park as well as Local Action Groups. The PI activities include protection, maintenance and promotion of the protected areas for the purpose of protecting and preserving the authenticity of nature, ensuring undisturbed natural processes, sustainable utilization of natural wealth, and the supervision of implementation of nature protection stipulations and activities within the protected areas.

The zonation of the Velebit BR was made for the first time in 2012 and follows the MAB Programme zoning system containing core, buffer and transition zone.

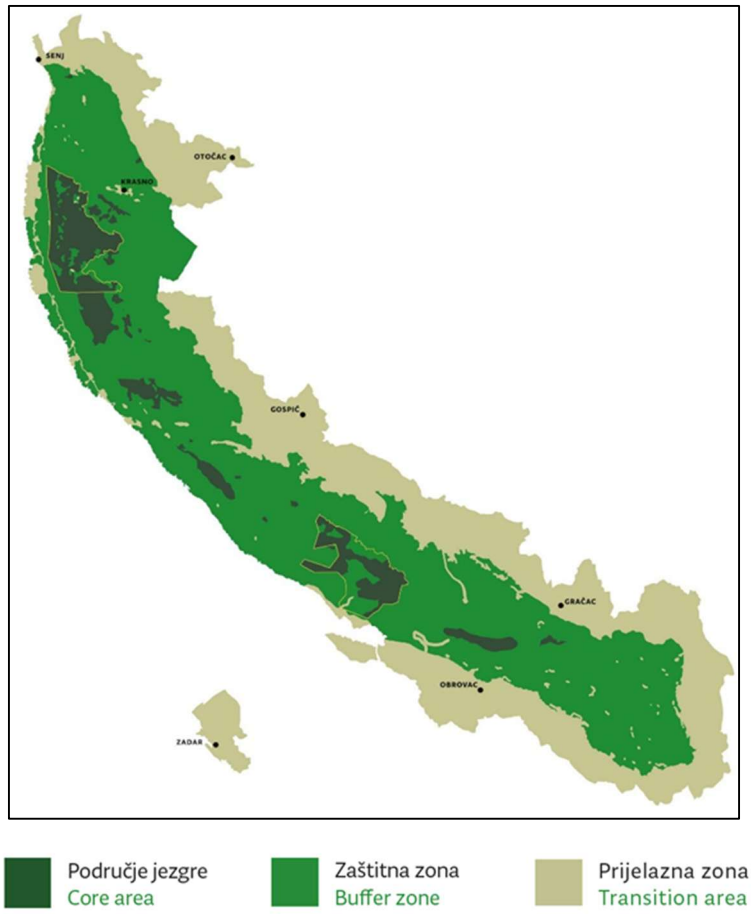

Figure 20: *Zonation of Biosphere Reserve Mountain Velebit (Source: www.np-paklenica.hr)*

The core zone of the Velebit BR corresponds to existing protected areas (PAs) designated as National Parks (Northern Velebit NP and Paklenica NP), Strict Nature Reserve (Rožanski i Hajdučki kukovi SNR) and isolated areas within the Nature Park (Velebit NP) in which there is no exploitation of natural resources or any economic activities with the exception of limited research and recreation. The core zone of the Velebit BR is the ecological backbone of the reserve and comprises areas with high biodiversity, minimally disturbed ecosystems with ongoing monitoring and research activities. The goals and activities in the core zone are predominately focused on the preservation of natural habitats, species and ecological processes, as well as the restoration of already degraded areas. The total surface of the core zone is 24.797 hectares constituting 12,18% of the total BR area.

The buffer zone corresponds to existing Nature Park borders and adjoins the core areas of the BR. The total surface of the buffer zone is 170,267 hectares, comprising 83,64% of the total BR area. It is characterized by a mosaic of cultivated land and small settlements separated by large forest areas. Economic activities and ecosystem services exploitation take place in this zone, under the provision that environmental protection conditions are fulfilled. This area is autochthonous economic resource for development of sustainable forestry, agriculture, water-use, and maritime resources as well as nature-based tourism. Emphasis is given to the sustainable management of natural resources, cultural values and to the active participation of the local community in developing sustainable recreational and touristic activities. Some of the key activities of this area are forestry, followed by hunting organized in hunting grounds, cattle-breeding, beekeeping, ecotourism and recreation, electricity generation and water supply. Ecosystem services in the buffer zone provide most of the inputs for cattle and dairy production, such as clean water and forage. Cattle, adapted to the harsh mountain conditions and easy to breed, are crucial for grasslands and meadows preservation, which are important habitats for biodiversity conservation as well as for local beekeeping and honey production. Velebit's honey is highly appreciated and has a higher market price compared to honey of other areas.

The transition zone mostly comprises populated areas next to the buffer zone, where educational activities are conducted, and sustainable development is promoted as part of economic development.

The importance of the Velebit mountain is recognized internationally. Besides the National Protection, which is regulated by the Nature Protection Act, this area is also protected as a NATURA 2000 site, being an ecologically important area on the European level. The Croatian Ecological Network Natura 2000 was designated by the Ordinance on the Ecological Network in 2013. A wide range of areas has been defined as the areas on Velebit mountain important for the conservation of endangered plant and animal species and habitats. In total, 64 sites have been designated as Special Areas of Conservation, including the whole areas of Northern Velebit National Park, Paklenica National Park and the whole Velebit mountain as a Special Protected Area.

Due to their outstanding universal value, the primeval beech forests in the Velebit Mountain BR (Paklenica National Park and Northern Velebit National Park) were designated as beech forest component parts of the UNESCO World Heritage Site "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe" in 2017.

The beech forests of the Paklenica and Northern Velebit National Parks represent exceptionally preserved and undisturbed forest ecosystems, whose authenticity and integrity have been secured by years of protection. They are a valuable part of the European primeval beech forests and an important haven for many species, some of which, like the bear, lynx, wolf, stag beetle, longhorn beetle, and holly, peony or forest orchids, are endangered worldwide.

Figure 21: *Beech forests in the HFR Velebit Mountain (Source: Ivana Adžić)*

1.3. What is Heritage Interpretation?

Heritage Interpretation is the practice of sharing and making sense of natural and cultural heritage in a way that is engaging and meaningful. It involves using various techniques such as storytelling, interactive exhibits, and guided tours to help people connect with historical sites, artefacts, and traditions (cultural heritage) or phenomena in nature (natural heritage).

Professional Heritage Interpretation originated around the mid-20th century through the US National Park Service and, thus, is deeply linked to the history of national parks. In 1957, the journalist Freeman Tilden wrote his seminal book "Interpreting Our Heritage for the US National Park Service" in which he first defined heritage interpretation and laid down its principles (see chapter 1.3.2). In Europe, since 2010, an own organisation, the "European Association for Heritage Interpretation", called *Interpret Europe*, was set up, in which more and more professional interpreters share and develop their work. Nowadays, Heritage Interpretation is a global approach that empowers people to take ownership of their shared heritage.

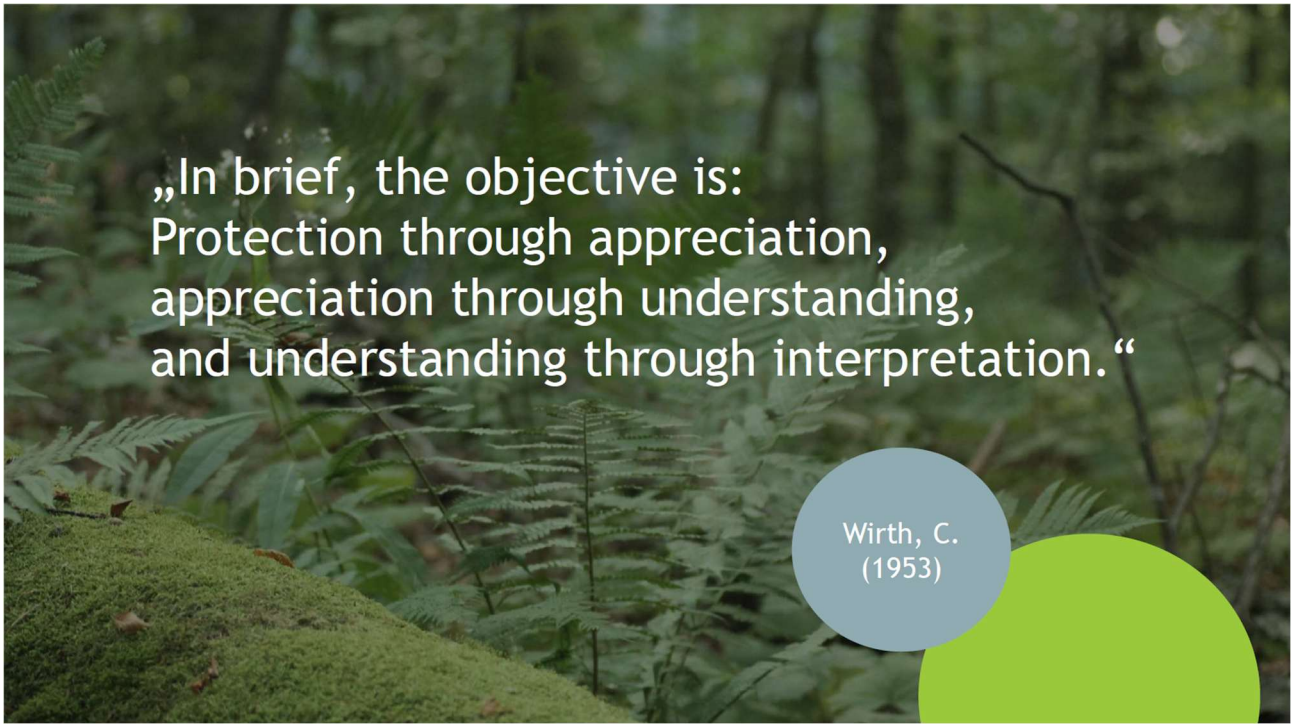

Figure 22: *The objective of heritage interpretation*
(Source: Wirth, C. (1953) Securing Protection and Conservation Objectives through Interpretation. Unpublished memorandum. Washington: US Department of the Interior)

1.3.1. The Interpretation Triangle

When people have an encounter with a heritage site or object, and when they then return to their day-to-day business, does this heritage site or phenomenon become more meaningful to them? Do they feel more connected to it, and do they realise it has to do with their own lives and with their decisions for the future? What is so important that people start to value something with which they did not have any close relationship before? These are the core questions to deal with when working with Heritage Interpretation.

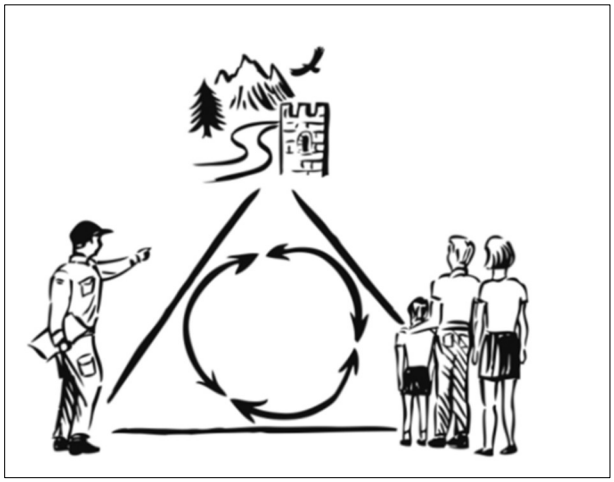

Figure 23: *The Interpretation Triangle.*
(Source: Ludwig, T. (2015). The Interpretive Guide. Sharing Heritage with People. 2nd edn. Werleshausen: Bildungswerk interpretation)

The Interpretation Triangle describes the 'magic field', in which a deeper connection between visitors and a heritage phenomenon can be created. For every interpretive process, the three cornerstones of the Interpretation Triangle are important:

- the phenomenon to be experienced,
- the people experiencing it,
- the media facilitating its interpretation (e.g. an interpretive guide, text etc.).

The art of interpretation is to create this 'magic field' between the phenomenon, the facilitating media and the people by:

1. turning phenomena into experiences,
2. provoking resonance in participants,
3. offering paths to deeper meaning,
4. fostering respect for all heritage.

Figure 24: *Nature interpretation in Angermünde, Germany, May 2024 (Source: Angermünde City Administration)*

These are the four elements of interpretation, commonly called “the four aces of interpretation”, which are directly connected to the interpretive triangle.

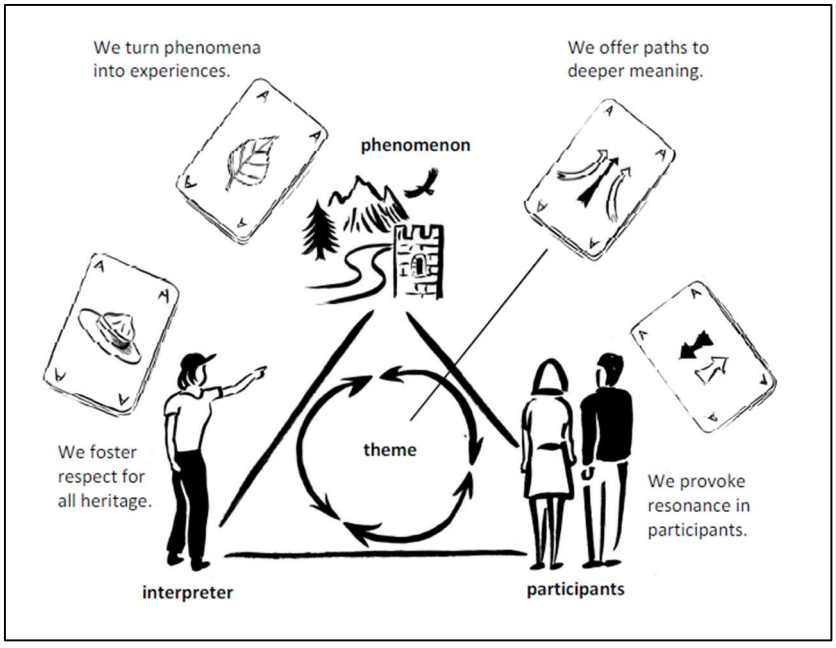

Figure 25: *The four aces of interpretation Source: Ludwig, T. (2015) The Interpretive Guide. Sharing Heritage with People. 2nd edition. Bildungswerk interpretation)*

1.3.2. Principles of good Heritage Interpretation

In 1957, Tilden wrote his seminal book "Interpreting Our Heritage for the US National Park Service" in which he first defined heritage interpretation and laid down its principles. Tilden defined Heritage Interpretation as "*an educational activity which aims to reveal meanings and relationships through the use of original objects, by first-hand experience, and by illustrative media, rather than simply to communicate factual information*[7]." Studying the practice of experienced guides in national parks, Tilden outlined six principles for good heritage interpretation[8]. These principles serve as a guide for interpreters to engage and connect with their audience in a meaningful way:

I. *Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.*

II. *Information, as such, is not interpretation. Interpretation is revelation based upon information. But they are entirely different things. However, all interpretation includes information.*

III. *Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical, or architectural. Any art is in some degree teachable.*

IV. *The chief aim of interpretation is not instruction, but provocation.*

V. *Interpretation should aim to present a whole rather than a part and must address itself to the whole man rather than any phase.*

VI. *Interpretation addressed to children (say up to the age of 12) should not be a dilution of the presentation to adults but should follow a fundamentally different approach. To be at its best it will require a separate program.*

These principles continue to be relevant in the field of interpretation today, guiding interpreters in creating engaging and meaningful experiences for visitors. In short, they can be summarized as follows:

I. Immediate **relationship** with the visitor's world
II. **Revelation** of facts and larger truths
III. Teachable **art**, which combines several skills
IV. Not instruction but **provocation**
V. Presenting a **whole** to the whole person
VI. Separate **programme for children**

Figure 26: *Interpretive walk through the UNESCO WH beech forest Grumsin, Germany, July 2024 (Source: Angermünde City Administration)*

[7] Tilden, F. (1957) Interpreting Our Heritage. Chapel Hill: The University of North Carolina Press, 8

[8] Tilden, F. (1957) Interpreting Our Heritage. Chapel Hill: The University of North Carolina Press, 9

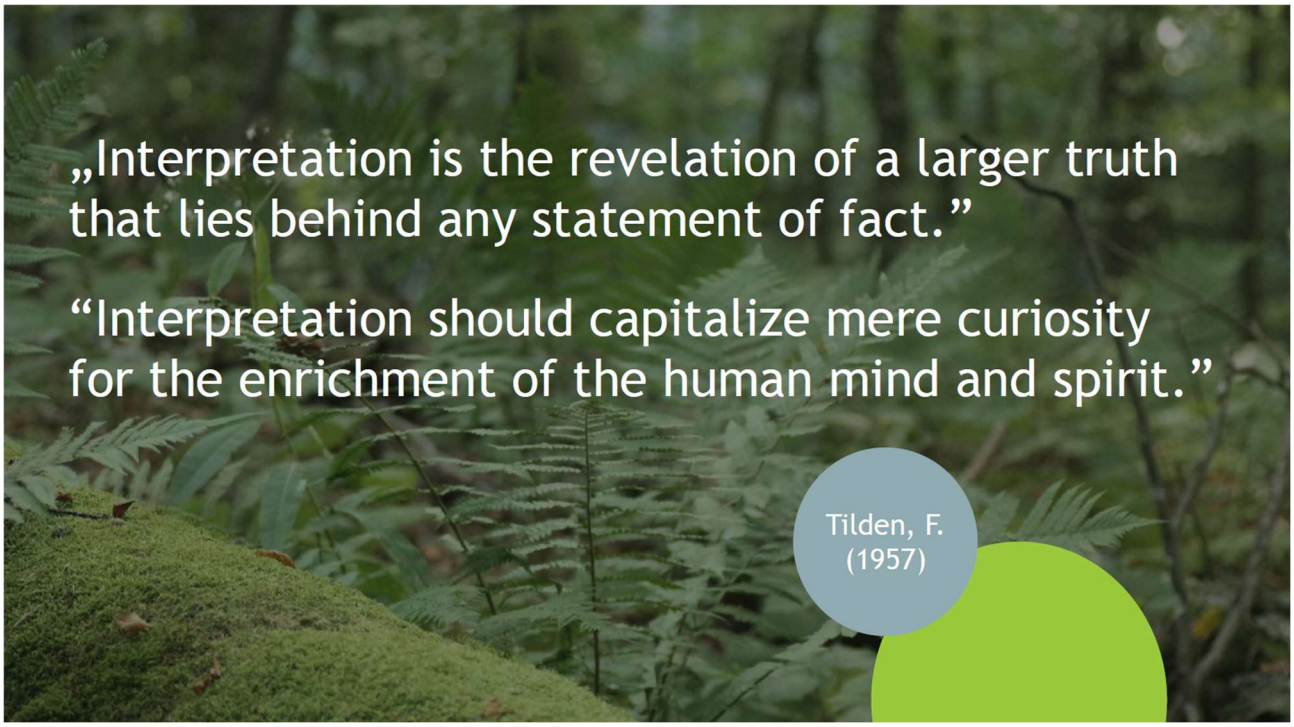

Figure 27: *Definition of Interpretation by F. Tilden*
(Source: Tilden, F., Interpreting Our Heritage. Chapel Hill: The University of North Carolina Press)

1.4. Nature Interpretation as a powerful tool for Healthy Forest Regions

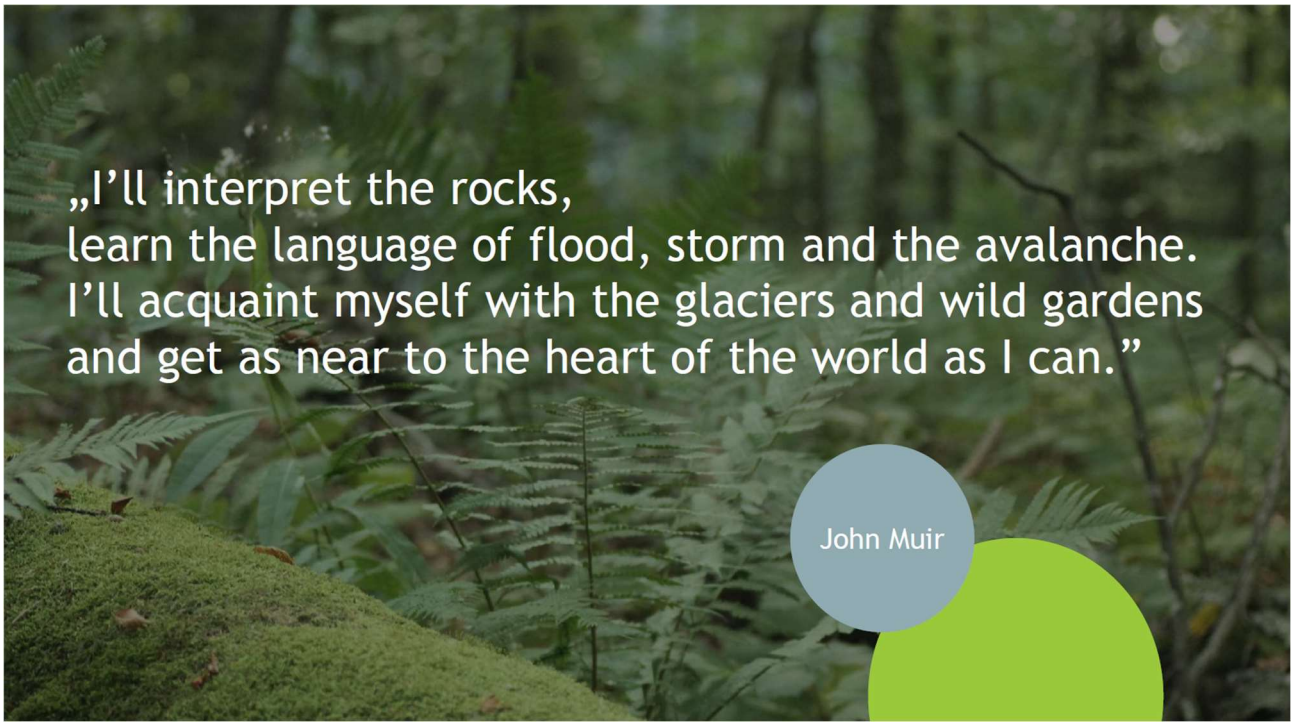

Figure 28: *Interpretation by John Muir (Source: John Muir)*

Healthy forests play a crucial role in supporting human health and well-being through the provision of various ecosystem services. In a *Healthy Forest Region*, people benefit from healthy forests in many ways. From clean air and water to mental and physical health benefits, healthy forests offer a wide range of advantages that are essential for our overall quality of life. Especially against the background of advancing climate change, healthy forests play a vital role in regulating the local and regional climate, mitigating the effects of climate change and reducing the impacts of natural hazards.

Heritage Interpretation, or more specifically in our context of *Healthy Forest Regions*, Nature Interpretation is a powerful tool to:

- provide insights into the significance and beauty of healthy forests and their contributions to human health and well-being and
- develop a greater understanding of our role in preserving and protecting the forest.

This is why Nature Interpretation plays a significant role in developing *Healthy Forest Regions*. With the help of Nature Interpretation, *Healthy Forest Regions* can be developed through the following key mechanisms:

1. **Raising Nature Awareness**

Nature Interpretation helps to educate the public, policymakers, and other forest-related stakeholders about the importance of forests and the need for managing them sustainably. By understanding the crucial role healthy forests play for human health and well-being, people are more likely to support conservation efforts and sustainable practices.

2. **Promoting Conservation**

Interpretive programs can highlight the critical functions of forests, such as biodiversity preservation, carbon sequestration and climate change mitigation and adaptation. This knowledge encourages communities and individuals to participate in conservation activities and support policies that support the health and regeneration of forest ecosystems.

3. **Encouraging Sustainable Practices**

Through interpretation, forest managers or owners can teach sustainable practices such as ecosystem-based or close-to-nature forest management, supporting natural regeneration and biodiversity conservation and alternative income sources such as nature tourism. These practices help maintain the health of forest ecosystems while providing economic benefits to local communities.

4. **Fostering Connection with Nature**

Interpretive activities, such as guided walks, interpretive trails, and educational workshops, foster a deeper connection with nature. This connection can lead to greater appreciation and a sense of responsibility towards forest conservation.

5. **Supporting Research and Monitoring**

Nature Interpretation can be integrated into citizen science programs, where volunteers help collect data on forest health indicators. This involvement supports the monitoring of forest conditions and provides valuable data for research and management.

6. Reducing Human Impact

By educating visitors about the impacts of human activities on forest ecosystems, Nature Interpretation can reduce negative human impacts such as littering, off-trail hiking, and wildlife disturbances. Visitors who understand the importance of staying on designated trails and respecting wildlife are less likely to cause harm.

7. Providing Economic Incentives

Nature Interpretation programs can support sustainable forms of tourism (e.g. ecotourism, health tourism, nature tourism), which provide economic incentives for local communities to conserve forest areas. Well-managed, sustainable tourism can generate income while promoting environmental education and conservation.

8. Creating Community Engagement

Nature Interpretation can create community engagement, fostering a sense of stewardship and collective responsibility for forest conservation. Engaged communities are more likely to participate in activities that promote forest health, especially in their own region.

Nature interpretation can significantly support the development and maintenance of *Healthy Forest Regions*, e.g. through the implementation of various activities. Some examples are described in Chapter 3. Chapter 4 informs about the activities which were piloted in the HFR Project.

2. What makes a Region a Healthy Forest Region?

In the framework of the Interreg-project "Healthy Forest Regions: Supporting Healthy Forest ecosystems for human well-being in forest Regions", six project regions (see chapter 1.1.2) in Central Europe are cooperating to support their transformation into **Healthy Forest Regions**. The shared understanding of a Healthy Forest Region is one of a region in which the promotion and conservation of healthy, functional forests has a priority in decision-making and regional development processes to assure the provision of forest ecosystem services for human health and well-being. But what does that mean in concrete terms? What differentiates a region from a Healthy Forest Region on the ground? Which qualifications must a region fulfil to become a Healthy Forest Region?

The nine project partners involved in this definition process have different backgrounds, experience and expertise (forest management institutions, universities, municipalities, NGOs etc.) and the project regions that serve as pilot areas are covering a variety of biogeographical regions situated in a very heterogenic set of socio-ecological and institutional framework conditions. Considering this diversity of perspectives, expertise and background, the joint development of the definition of HFR is a valid starting point to kick-off the concept of Healthy Forest Regions.

2.1. Definition of Healthy Forest Regions

Within the *HealthyForestRegions* project, the involved project partners developed a joint definition for Healthy Forest Regions. This definition does not purport to be universal or complete. Rather, it serves as a working basis which might become subject to future adaptations or amendments according to the learnings made in the development of HFR.

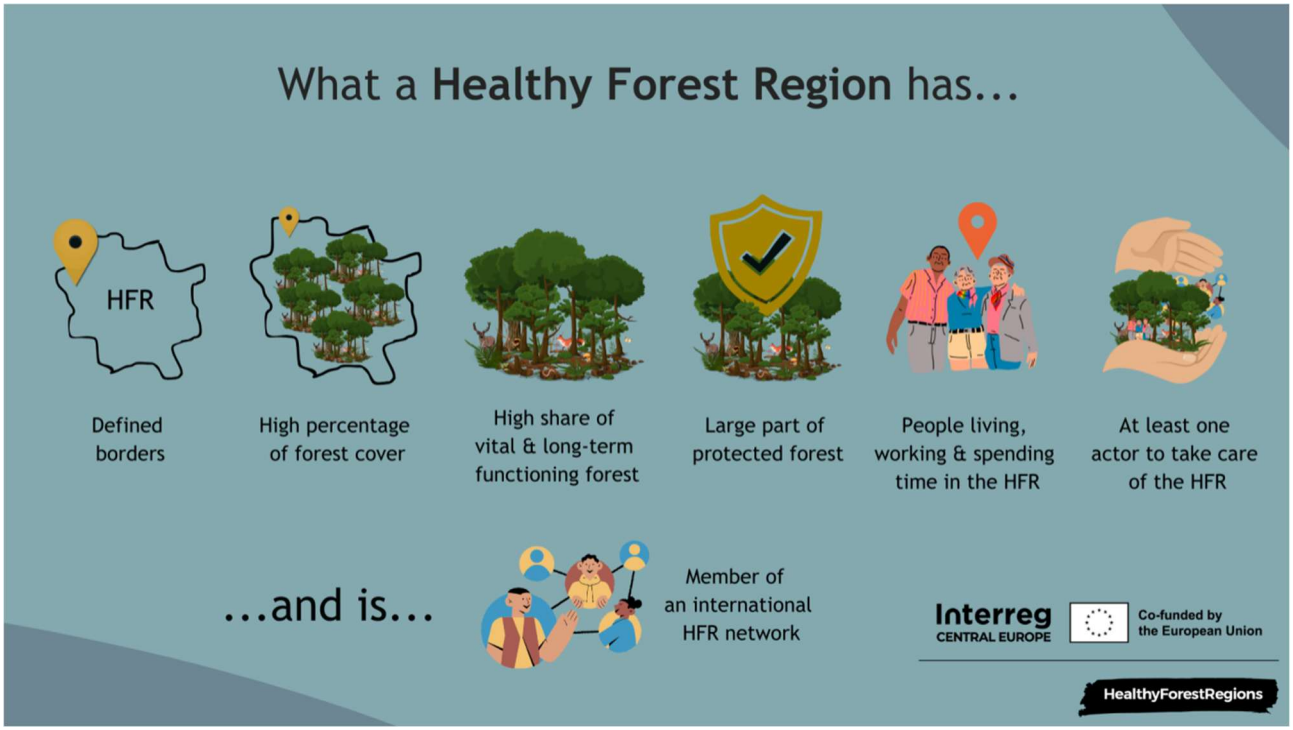

Figure 29: *Components of a Healthy Forest Region (Source: HFR Project)*

An HFR is predominantly characterized by the presence of healthy forest ecosystems. **A Healthy Forest can be described as a forest ecosystem with inherent structures, functions and dynamics that provide it with both the necessary efficiency and resilience to develop without abrupt and large-scale changes in emergent system properties or geographic distribution, and the ability to respond flexibly to external changes. These emergent properties include, among others, a stable discernible microclimate, high energy intake, high exergy storage, high level of self-organization, self-regulation and (regulatory) influence on the environment, and great contributions to self-preservation.**

In the definition process for HFR, the following key questions were addressed as stepping-stones:

What does a Healthy Forest Region look like?

A Healthy Forest Region is a forest-rich region that has defined borders, a high share of vital and long-term functioning forest with a great capacity to regulate, balance and adapt itself, as well as a large part of protected forest area. An HFR is member of an international network and does not only comprise forests, but also settled areas with people living, working and spending time in the region. Furthermore, an HFR counts with at least one key actor that promotes and takes care of the implementation and further development of the HFR.

What makes a Healthy Forest Region stand out?

In a Healthy Forest Region, polity, politics and policy prioritize the value of healthy forest ecosystems and their diverse ecosystem services, recognizing them as essential for human well-being and regional resilience to evolving social-ecological challenges. Healthy forest ecosystems, which are the predominant feature of an HFR, form the foundational basis upon which all other systems – social, societal, and economic – are built and sustained.

What does a Healthy Forest Region commit to?

The actors of an HFR commit to action principles that emphasize an **ecosystem-based approach** to forest management. This approach aims to maintain and enhance forest cover, forest health and ecosystem-specific biodiversity by supporting ecosystem (self-)regulation and typical ecological processes. These principles also include a commitment to offering educational activities about the importance of healthy forest ecosystems. Additionally, they prioritize regionality, social-ecological transition, forest health, and human well-being in both the development and adaptation of land use and human infrastructure.

Combining these answers results in the following general definition of an HFR as follows:

> *"A Healthy Forest Region (HFR) is a forest-rich region characterized by a high proportion of healthy forests and supported by an international network. The diverse services provided by forest ecosystems are recognized as essential for human well-being and regional resilience in the face of inevitable social-ecological changes. Key actors within an HFR are committed to the conservation and promotion of forest health following guiding principles such as ecosystem-based forest management."*

According to this general definition, an HFR is committed to the following guiding action principles:

1) **Ecosystem-based Forest Management**
   - Implement an ecosystem-based forest management including ecosystem-specific biodiversity conservation on a regional level to:
     - maintain and/ or enhance forest health,
     - maintain and/or expand healthy forest areas,
     - maintain and/or increase forest cover.

2) **Sustainable regional Development:**
   - Integrate considerations of regionality, social-ecological transition, forest health and human well-being into the development and adaptation of human infrastructure.

3) **Education and Awareness:**
   - Facilitate education for diverse stakeholder groups about forest ecosystems and their essential services.

4) **International Collaboration**:
   - Engage in international cooperation and exchange with other HFRs within a global network.

5) **Research and Monitoring:**
   - Support, organize and/or conduct research and monitoring activities to assess forest health and the provision of ecosystem services.

6) **Participatory Governance**:
   - Provide inclusive opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, fostering the principles and core ideals of an HFR.


HFR Guiding Action Principles
1
Implement ecosystem-based, close-to-nature forest management and ecosystem-specific biodiversity conservation
3
Consider regionality, social-ecological transition, forest health and human well-being in the development and adaptation of human infrastructure
5
Integrate the education of different groups of stakeholders about forest ecosystems and their services
2
Engage in international cooperation and exchange with other HFRs in a network
4
Support, organize and/or conduct research and monitoring of the health and ecosystem services of the regional forests
6
ACT NOW!
Provide diverse opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, supporting the idea of an HFR

2.2. Forest Ecosystem Services

In an HFR, anchoring the value of forest ecosystems into sustainable regional development processes is essential. This requires raising awareness among policymakers about the significant contributions of forest ecosystems to human health and well-being through the provision of ecosystem services.
Forest ecosystems fulfil a wide array of regulatory, habitat, production, and informational functions, which collectively generate a diverse set of ecosystem services and goods beneficial to human populations. These benefits derive directly from ecosystems as well as indirectly through their integration into economic and other human activities.

Forest functionality refers to the range of ecosystem functions and services that a forest ecosystem can perform or provide.

Ecosystem Functions
Ecosystem functions are the ecological (biological, chemical and physical) mechanisms that sustain the integrity and maintenance of ecosystems. Ecosystem functions, such as primary production or decomposition arise from interactions between ecosystem structures and processes[9]. While these functions underpin ecosystem health, they do not always translate directly into benefits for humans. Ecosystem functions are sometimes referred to as "supporting services"[10] because they provide the ecological processes upon which other benefits depend.

Ecosystem Services
Ecosystem services are the contributions of ecosystems to human well-being, defined by their specific benefits to individuals or society. These services arise from the underlying ecosystem functions that generate them. This concept adopts a human-centred perspective, focusing on the flow of natural capital. Valuation is oriented toward the current and future benefits provided by these services, as well as the risks associated with their loss. This approach emphasizes the tangible and measurable contributions of ecosystems to human societies, making it a powerful tool for sustainable regional planning and decision-making.

[9] Ansink et al. 2008 (https://link.springer.com/article/10.1007/s10531-017-1453-2/tables/2 (accessed 22.07.2024)
[10] e.g., Millennium Ecosystem Assessment 2005

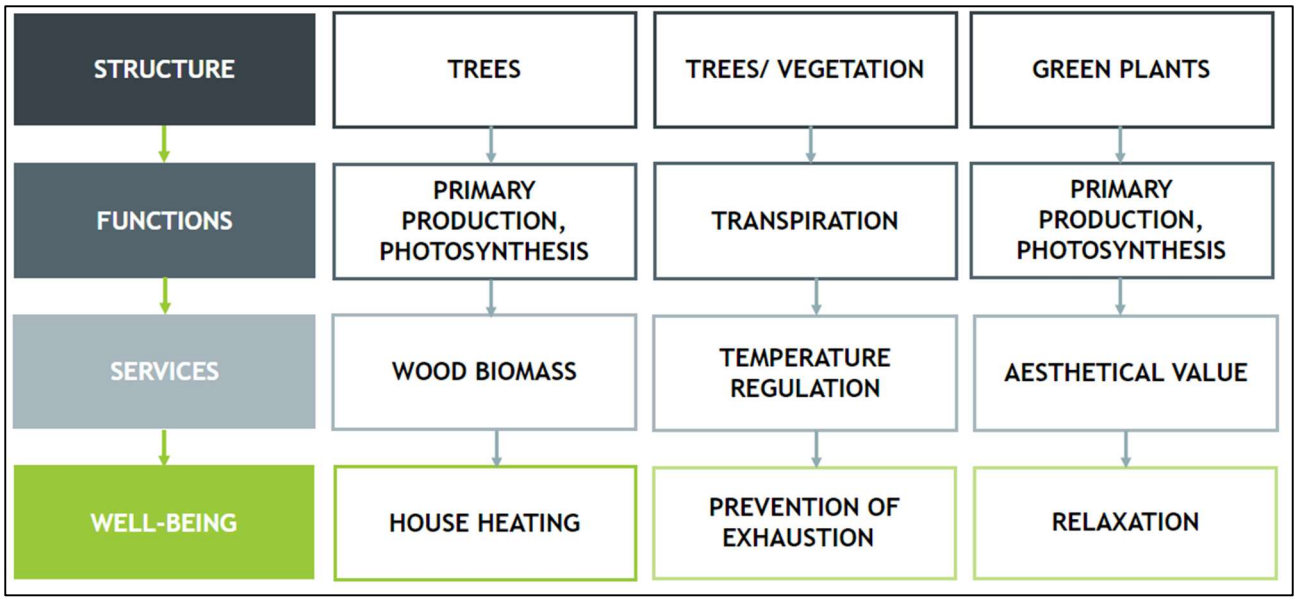

Figure 30: *Examples of dependencies between ecosystems and human-wellbeing through provisioning, regulating and cultural ecosystem services (Source: HFR project)*

In the HFR project, an internationally accepted classification of ecosystem services as provided by the Common International Classification of Ecosystem Services (CICES) is followed. CICES has been designed to help to measure, account for, and assess ecosystem services and is used widely in ecosystem services research for designing indicators, mapping and valuation.

According to CICES V5.1[11], three major sections of ecosystem services are:

Provisioning services – refer to all nutritional, non-nutritional material, and energetic outputs derived from living systems, as well as abiotic outputs (including water) that are extracted or harvested from ecosystems.

Examples include:

- **Fresh water:** Healthy forests play a crucial role in providing clean water, positively influencing its quantity and quality while reducing filtration costs for cities.
- **Fresh air:** Trees release oxygen through photosynthesis, cool the air via evapotranspiration and improve air quality by capturing dust, ash, pollen and smoke on their leaves.
- **Logs:** Wood has been used for thousands of years as a construction material for housing and paper and is also increasingly being used for textiles.
- **Fuelwood:** Used for cooking and heating, fuelwood serves various needs indoors (furnaces, stoves, fireplaces) and outdoors (campfires, bonfires).
- **Mushrooms:** Mushrooms are being increasingly recognized not only for their ecological significance but also for their nutritional value. All types of edible mushrooms contain varying degrees of protein and fibre.
- **Honey:** Produced by bees from forest plant secretions, honey is a nutrient-rich superfood vital for sustaining life.
- **Wild-harvested fish:** Fish obtained from natural aquatic ecosystems.
- **Wild-Harvested food:** Includes various edible products like fruits, nuts, and plants sourced from the wild.

[11] Haines-Young and Potschin, 2018

Regulating and maintenance services – refer to all ecosystem services resulting from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions, together with abiotic equivalents, that are beneficial to individuals and society, affecting human health, safety or comfort.

Examples include:

- **Climate regulation:** Forests regulate climate at local, regional and continental scales by producing atmospheric moisture and rainfall and controlling temperature.
- **Carbon sequestration:** Forests absorb carbon dioxide during growth and store it in biomass, reducing atmospheric CO_2 levels.
- **Erosion regulation:** Leaf canopies intercept rain, reducing erosion by providing surfaces for evaporation, while roots absorb water and enhance soil infiltration.
- **Natural hazard regulation:** Forests mitigate the impact of natural hazards by retaining excess rainwater, preventing extreme runoff, reducing flood damage, and serving as windbreaks for urban areas.
- **Water purification:** Forest soils filter out pollutants such as mercury, pesticides, and other harmful substances, ensuring cleaner water—a process especially dependent on healthy forest ecosystems.
- **Air pollution control:** Trees improve air quality by absorbing odours and gases (e.g. nitrogen oxides, ammonia, sulphur dioxide and ozone) and trapping particles from the air on their leaves and bark.

Cultural services – refer to all the non-material, and typically non-rival and non-consumptive benefits provided by ecosystems, both biotic and abiotic. These services are experiential and intangible, contributing to a wide range of cultural benefits that influence the physical and mental well-being of people. Some examples:

Examples include:

- **Recreation:** Forests offer a variety of activities such as biking, hiking, trekking, walking, meditation, tree hugging, tree climbing, camping, zip-lining, skiing, sledding, rafting, etc.
- **Tourism:** Eco-tourism activities like visiting healthy forests or protected areas, birdwatching, and exploring natural landscapes foster a deeper appreciation for nature.
- **Aesthetic values:** Trees add beauty to their surroundings by adding colour to an area, softening harsh lines of buildings, screening unsightly views and contributing to the value of nearby properties.
- **Spiritual heritage:** Forests often hold intrinsic or associated sacredness and serve as spaces for significant spiritual experiences, reflection, or transcendence.
- **Education:** Forest pedagogy provides environmental education about forest ecosystems, their interrelations and processes, forest management, and the benefits they offer to humans.
- **Inspirational values:** Forests inspire countless works of art, including songs, fairy tales, poems, paintings, films, and other creative expressions, highlighting their profound impact on human imagination.

2.3. Interest Groups in a Healthy Forest Region

A Healthy Forest Region encompasses not only forested areas but also settlement structures, including the people who live, work, and spend time there. Understanding the various interest groups present in the region and how their goals and actions influence the HFR is critical. Equally important is determining how to engage these groups effectively for the preservation of natural resources through interpretive planning. The interpretation plan should address the goals of different stakeholder groups of the HFR, identifying areas of common ground as well as potential conflicts to facilitate those in favour of the development of the HFR.

The following section identifies potential interest groups that may influence the development of a Healthy Forest Region based on their specific interests and activities within the area and outlines how they can be positively influenced in favour of this goal through interpretation planning:

Municipalities, Municipal Interest Associations, Regional Governments, and Professional Organizations of Public Service Providers

In some cases, these groups may own forested areas and play a direct role in forest management. However, ownership or management is not always the case which limits their influence on the configuration of forest management activities. Their primary interest lies in promoting regional development and improve the well-being of local communities. They advocate for local needs and aim to align development with community interests, although their perspectives how to achieve this vary significantly.
For these stakeholders, an interpretation plan can serve as a valuable tool to educate local communities about the critical role of forest ecosystems in enhancing their well-being. Additionally, it can help explain the principles of sustainable forest management, fostering greater public understanding and support. This implies, however, that these interest groups are aware of the pivotal role of healthy forests for a sustainable regional development.

Land/ Forest Owners and Managers
An HFR generally may extend over an area owned by multiple stakeholders, which may include private individuals or state institutions, foundations, municipalities, associations etc. The interests of the owners might include maintaining the forest to derive benefits from it, although their priorities vary. Some may prioritize ecological benefits, while others focus on economic returns, depending on their philosophies and goals. In certain regions, such as Kočevsko and Eisenwurzen, forest management is closely integrated with nature conservation efforts. However, in other areas, forest management and nature conservation institutions operate independently, leading to diverse stakeholder interests that range from economic gains to environmental protection and individual benefits.
For this group, an interpretation plan should aim to support sustainable forest management practices within HFR. It should also effectively communicate the advantages of such management, emphasizing both ecological and economic benefits.

The information in Table 2 is based on the regional analyses of the administrative framework carried out in the framework of the HFR project and lists the forest owners and forest management in the project regions of the HFR project to exemplarily show the diversity of ownership structures and forest management in HFR.

Project Region	Prevailing nature of forest owners and forest management in the partner regions
Jizera Mts. Beech Forest (CZ)	The Jizera Mountain Beech Forest UNESCO site, including its protection zone, is entirely owned and managed by a single Forest Management Unit (FMU) — Lesy ČR, s.p., the Forestry Office in Frýdlant v Čechách (Czech Forests, a state enterprise).
Velebit (HR)	National Parks in Croatia are managed by public institutions established by the Croatian Government and operate under the jurisdiction of the Ministry of Economy and Sustainable Development. Most forests within the Velebit Nature Park are owned by the Republic of Croatia and are managed by the state-owned company Hrvatske šume d.o.o. (Croatian Forests Ltd).
Eisenwurzen (AT)	The Nature and Geopark encompasses four municipalities in the northern part of Styria. The area is characterized by significant nature conservation zones that span three regions. It includes six protected areas — such as nature parks, national parks, and wilderness areas — alongside public and private landowners. These entities collaborate through the "Netzwerk Naturwald", a voluntary association of organizations and protected areas dedicated to forest conservation and fostering connections between them.
Angermünde (DE)	The forest areas in the project region of Angermünde are owned by diverse stakeholders, including the City of Angermünde, the state forest management institution Landesbetrieb Forst Brandenburg, the Cultural Landscape Uckermark Association (KLU), and a wide range of private owners. The municipal forest of Angermünde is managed according to the FSC-standard.
Kočevsko (SI)	In the project region of Kočevsko, the majority of forests (73%) are state-owned, while 19% are privately owned and 8% belong to local communities. Forest management plans are developed at national, regional, and local levels by the public institution Slovenia Forest Service (SFS), which provides guidelines for forest owners. In state owned forest, the company Slovenski državni gozdovi (SiDG) is responsible for conducting forestry activities, selling forest wood products, managing logistics, overseeing real estate and forest acquisitions, processing wood, and supporting the development of all other forest functions.
Poloniny (SK)	The majority of forests in the project region of Poloniny are state-owned, accounting for 62% of the total area. Approximately 27% of the forests have unknown ownership. Private forests make up 5.2%, community forests 3.2%, owners' associations 2.5%, and church forests 0.3%. Forest management is guided by a forest management plan, which is updated every 10 years.

Table 2: Structure of the HFR forest owners and management within the project regions (Source: HFR project)

Nature Conservation Entities

Nature conservation significantly impacts the condition and use of forests in various locations. A defining characteristic of HFR is that at least part of the HFR area is protected. Nature conservation is a public service managed by ministerial authorities and their local organizations. In some regions, local non-profit organizations also advocate for nature conservation. In regions managed by national park administrations, conservation often receives the highest level of protection. Nature conservation authorities prioritize maintaining forests in conditions that sustain vital ecosystem functions. However, these efforts can sometimes conflict with the interests of other stakeholder groups.

Nature conservation entities play a crucial role in influencing the development of HFR. Their specific interests and activities often align with the protection and conservation of (healthy) forest ecosystems, ecosystem-specific biodiversity enhancement, and ecosystem-based forest management practices. They can positively impact an HFR e.g. through policy implementation ensuring the effectiveness of conservation laws, restoration projects (e.g. rehabilitating degraded forest landscapes), research and monitoring as well

as through educational activities, public relations and their advocacy lobbying for policies that support conservation efforts.
An interpretation plan can serve as a communication tool to highlight the importance of conservation measures. This is particularly relevant in regions without dedicated national park administrations or similar entities to advocate effectively for nature conservation to visitors and residents.

Entrepreneurs in Tourism

Tourism-related businesses benefit from the region's natural attractions, particularly its scenic landscapes. This stakeholder group is diverse, including businesses involved in accommodations, catering, travel agencies, tour operations, spa management, and program production. Companies range from small enterprises to large-scale organizations.

An interpretation plan should outline how to convey the values of healthy forests to visitors, fostering a meaningful connection with the area and encouraging respect for and appreciation of these values. For entrepreneurs in tourism, an interpretation plan should provide a clear and accessible understanding of the importance of adhering to the regulations and restrictions for business activities in the respective region. It should also guide them in identifying forms of tourism that align with preserving the area's (forests) ecosystems and their services.

Destination Management Organizations (DMOs)
In some areas, DMOs bring together local entrepreneurs and tourism stakeholders (including municipalities). Their objectives include:

- Enhancing primary and secondary tourism infrastructure,
- Creating new jobs and fostering regional economic development,
- Increasing destination prestige,
- Supporting broader regional development (e.g., basic infrastructure improvements, communication networks, and public services), and
- Promoting sustainable tourism by optimizing the area's long-term tourism potential[12].

An interpretation plan should provide destination management entities with guidance on the appropriate scope of destination management services in HFR. It should clarify the unique characteristics of these regions to support the effective implementation of tourism services. Additionally, the plan should offer strategies for presenting and promoting the respective region in a manner that preserves and enhances its provision of ecosystem services.

Wood Processing Industry
The wood processing industry can have a significant impact on Healthy Forest Regions. Its primary interest lies in economic profits from timber harvesting, which may conflict with the objectives of other stakeholder groups, such as nature conservation entities and tourism stakeholders.
Against this background, an interpretation plan should focus on communicating the importance of healthy forests and explaining potential timber harvest restrictions to stakeholders.

[12] Source: https://www.czechtourism.cz/cs-CZ/a13bee8a-34ab-4fe2-b002-0ec2f14033ac/page/mapa-dmo (quoted 3.7. 2024)

Other Entrepreneurs

Other business activities within HFR are often regulated by spatial plans or legal frameworks for areas near protected zones. For these stakeholders, an interpretation plan can provide clarity on restrictions and highlight opportunities for operating within the HFR concerned.

Visitors

Visitors include day-trippers and overnight tourists, as well as residents from nearby towns and second-home owners. Their activities typically revolve around rest, relaxation, sports, entertainment, and occasionally, learning about forest ecosystems.

Visitors can influence a healthy forest region especially if they are present in large numbers in the area. They might have a negative impact, e.g. by causing habitat disturbance, littering and pollution or even threaten a forest through a higher fire risk due to inappropriate behaviour. On the other hand, visitors can support the development of HFR contributing to the local economy through ecotourism and become advocates for conservation efforts.

The role of the interpretation plan for this interest group is to:

- Enhance the visitor's understanding of forest ecosystem services and their importance,
- Educate visitors on conservation efforts, and
- Ensure awareness of rules and restrictions to protect the forest area concerned

Residents

Residents, who live permanently within an HFR, often have a historical and cultural connection with the region and its forest. Historically, they relied on the forest and its resources such as timber, berries or mushrooms – and might even do so still today – and now may feel constrained by restrictions (e.g., limited forest access or regulated timber sales) or inconvenienced by the presence of tourists. It might also be the case that residents are not always aware of the value of their forest region in terms of human well-being and might take it for granted.

Thus, interpretive planning should aim to:

- Foster a deeper appreciation among residents for the value of the HFR they live in, and
- Promote an understanding of forest ecosystem services to support human well-being.

The interests and needs of the various groups mentioned above have been described to identify potential synergies and conflicts. An interpretation plan should serve as a tool for communicating shared goals, as well as highlighting areas of tension.

The common theme uniting all interest groups is the promotion of ecosystem-based forest management and the sustainable use of forest ecosystems within the respective HFR. This includes the need to protect, preserve, and enhance natural values, ensuring that these resources remain intact for future generations. While the interests of these groups often overlap, they can also be in conflict due to differences in legal status, missions, and goals. For instance, the desire to care for nature and preserve the landscape can sometimes conflict with the goal of utilizing natural heritage for tourism purposes.

Potential conflicts an interpretation plan may address include:

- **Conflicting forms of use:** Maintaining functional forest ecosystems often necessitates restrictions that can limit the forest's economic utility. This can create tensions with forest owners, particularly those focused on timber production and related activities.
- **Overcrowding:** The tendency to use or even maximize the site's capacity, which will not allow visitors to enjoy the magic of nature and endanger forest health
- **Inappropriate activities**: Proposals for investment or activities that are unsuitable for the location,
- **Overburdened infrastructure**: Overloading the boarding points and transport routes, especially on weekends and holidays,
- **Service shortages:** Insufficient capacity or quality of services offered to visitors, e.g. accommodation, catering etc.
- **Non-compliance with rules:** Ignorance or disregard of the site's rules and restrictions by visitors and residents.

3. Planning part

The development of this Interpretation Plan for HFR was designed as a participatory process with two important steps:

1) **International online workshop** with the HFR project and associated partners with the aim to:
   - Identify the common features of and differences between the project regions,
2) **Regional Workshops** with key actors and stakeholders in four target regions (CZ, DE, SI, HR) with the aim to:
   - Formulate key messages for communicating the contributions of healthy forests to human well-being,
   - Develop formats, methods and instruments for the implementation of the Interpretation Plan at a regional scale.

As a result of this process, key messages, objectives (cognitive, emotional and behavioural), target groups as well as formats and tools of interpretation were defined to communicate the value of healthy, functional forests and their ES contributing to human health and well-being.

3.1. What to interpret?

As highlighted in previous chapters, forest ecosystems are essential for supporting ecosystem-specific biodiversity and delivering numerous benefits to human well-being. Breaking down the complex interdependency between forest and human health, the following core message was formulated:

Figure 31: *Core message for HFR (Source: HFR Project)*

To more specifically communicate about the value of functional forests and their ecosystem services contributing to human health and well-being, four guiding questions were addressed with the aim to develop key messages that form the ground for the interpretation activities:

1) What is a "healthy forest"?

A healthy forest is characterized by its resistance and resilience, which underpin its functionality and capacity to deliver a wide range of ecosystem services. These services offer numerous benefits, such as safeguarding plant and animal biodiversity, ensuring clean water and air, and sustaining essential ecosystem dynamics. Moreover, healthy forests play a crucial role in adapting to and mitigating the impacts of climate change.

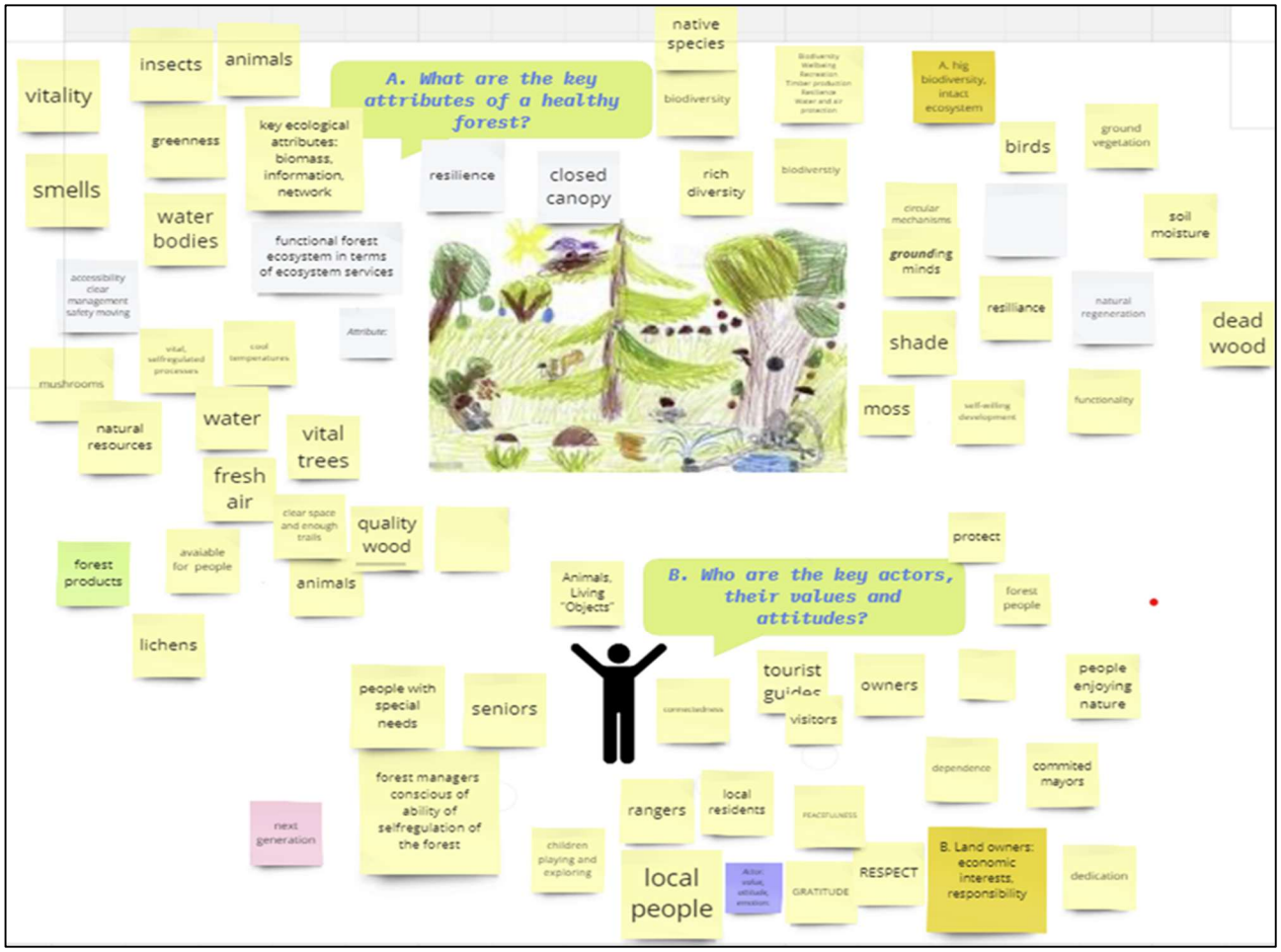

Figure 32: *Screenshot from the International Online Workshop (Source: HFR Project)*

A more specific definition for the concept of "healthy forest" is provided in chapter 2.1. Making this definition more tangible for interpretation purposes, a healthy forest can be described as follows:

> *Imagine stepping into a forest full of different plants, animals, fungi and tiny bacteria, which all live under one wide vividly green canopy of old and younger trees. All these living beings are very much related and often helpful to each other. The air is fresh, and you recognize the temperature is lower than outside. It seems like the forest is in a state of strong balance. At the same time, it appears to be flexible enough to recover and grow again even when bad storms and boiling hot summer days hit it hard. You leave the forest, and you feel good: relaxed, inspired, closer to nature and maybe even healthier than before.*
>
> *(Source: HFR project)*

To create a common understanding for communication purposes, the following key message was formulated:

Figure 33: *Key message 1 (Source: HFR project)*

2) How do humans benefit from healthy forests?

Ecosystem services are the vital benefits that humans derive from nature. Forests deliver an array of these services, ranging from clean water supply to carbon sequestration. Spending time in high-quality natural environments promotes health and well-being. Forests support life through a wide spectrum of ecosystem services, including:

- Provisioning services, such as fresh water and raw materials;
- Regulating services, like climate regulation and pollination;
- Cultural services, which offer opportunities for recreation, relaxation, and spiritual enrichment.

Healthy forests are indispensable for sustaining these benefits and enhancing human well-being. Important examples for forest ecosystem services are provided in chapter 2.2.

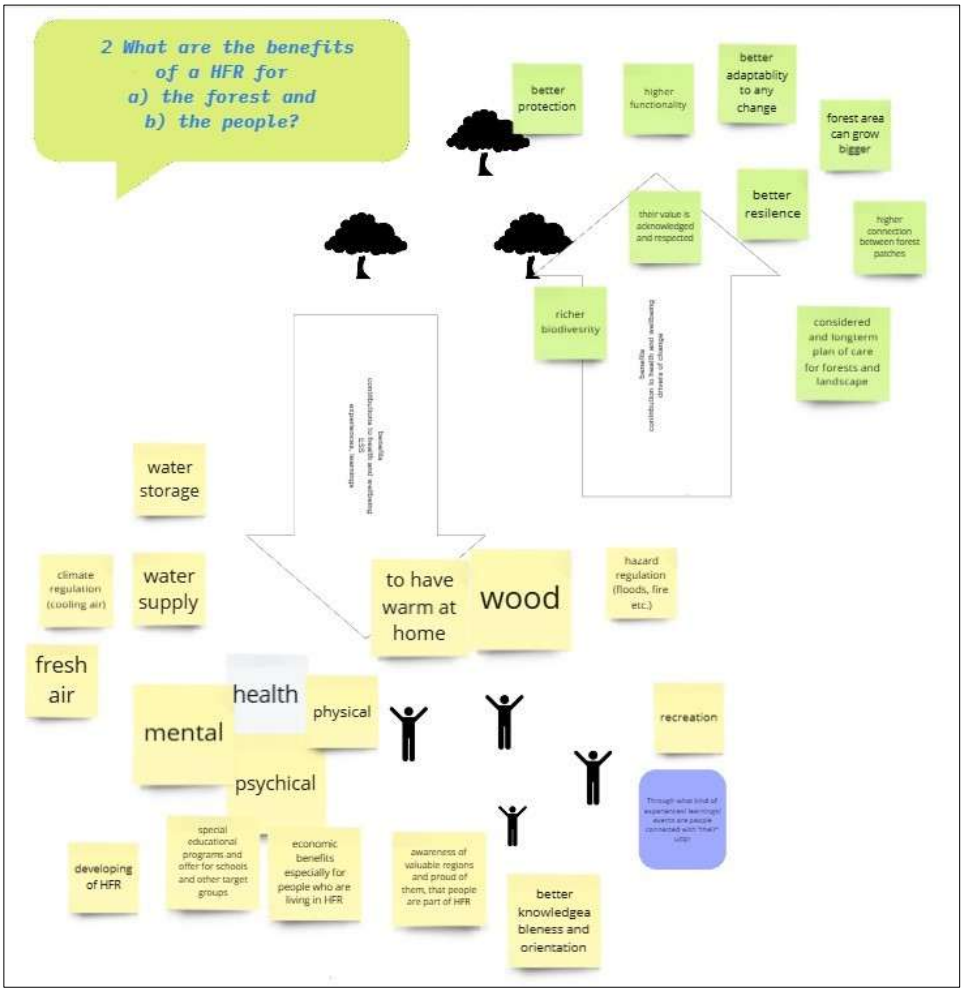

Figure 34: *Screenshots from the International Online Workshop (Source: HFR Project)*

An HFR is characterized by a higher provision of forest ecosystem services compared to other forest regions. An initial list of ecosystem services characteristically provided by healthy forests in an HFR is provided in Table 3 and can be used for interpretive activities.

Forest ecosystem services in Healthy Forest Regions	
Provisioning services	• Healthy forests satisfy human basic needs providing us with fresh air and clean water. • Healthy forests provide diverse habitat types for our wildlife and, thus, contribute to the protection of biodiversity • Healthy forests are the gene base and source of local populations of tree species for the restoration and stabilization of other forests • Healthy forests provide a variety of food (e.g. mushrooms, fruits), medicinal assets and wood and raw materials • Healthy forests contribute to regional value creation, e.g. through tourist/recreational activities
Regulating services	• Healthy forests are our life insurance. They can lessen the impacts of climate change and help us to adapt to its consequences • Healthy forests function like a natural air conditioning system. They evaporate water and cool their surroundings providing a cool shelter during hot summer days • Healthy forests play an important role in the mitigation of natural hazards: They act as a natural buffer against extreme weather conditions and rapid changes in their surroundings. • Healthy forests are climate protectors. As carbon sinks, they can store CO_2 over a long period of time.
Cultural services	• Spending time in healthy forests has a relaxing effect on our body, soul and mind. • As a landscape-shaping element, healthy forests enhance the natural beauty of a landscape • Healthy forests are cultural places or asset (e.g. religious place, spiritual meaning) • Healthy forests are place of learning (e.g. education, guided tours, research, etc.) • Healthy forests are places of history, mysticism and magic (e.g. fairy tales etc.).

Table 3: Initial list of forest ecosystem services provided in a Healthy Forest Region (Source: HFR project)

For communicating the value of Healthy Forests in terms of the ecosystem services they provide contributing to human well-being, the following key message was formulated:

Figure 35: *Key message 2 (Source: own elaboration)*

3) What can be done to keep forests healthy?

Natural disturbances are integral to forest dynamics, promoting renewal and succession by releasing nutrients from affected trees and reducing competition among surviving and newly establishing trees. Additionally, the increased presence of deadwood supports diverse habitats, enhancing ecosystem-specific biodiversity. However, extreme events and cumulative pressures significantly impact the health of European forests, compromising their ability to sustain optimal ecosystem functions, structures, and compositions. They are increasingly suffering from external threats caused by unsustainable forest management, the consequences of climate change and other environmental threats e.g. caused by unsustainable land-use practises in the surrounding landscape.

Ecosystem-based forest management is essential for safeguarding European forests and ensuring their long-term health by preserving their ecological integrity. It is important to communicate the benefits of an ecosystem-based forest management which ensure long-term forest health by preserving the ecological integrity of forests. For this, the following key message was formulated:

Figure 36: *Key message 3 (Source: HFR project)*

3) How can an HFR benefit from its healthy forests?

Forest health is one basic pillar of the economic stability in an HFR: There can be no sustainable economy on an unhealthy planet. Environmental degradation exacerbates climate change, ecosystem-specific biodiversity loss, and the rise of new diseases. Forests and trees are vital in mitigating these crises and fostering human well-being. The economic success of a region is intrinsically tied to the health of its surrounding ecosystems. Healthy forest ecosystems, in particular, are fundamental to ensuring the stability and prosperity of a region with a functional economy. They offer opportunities for local communities, providing a foundation for a region to thrive as a Healthy Forest Region. This supports sustainable development and secures a promising future for its inhabitants.

The importance of healthy (forest) ecosystems for a sustainable regional development can be broken down into the following key message:

Figure 37: *Key message 4 (Source: HFR project)*

3.2. Why to interpret?

The primary goal of nature interpretation is to inspire visitors to recognize and appreciate the natural values they experience while staying in healthy forests. This understanding fosters a sense of connection to special natural places, ultimately promoting improved management and conservation of nature.

The interpretation of Healthy Forest Regions addresses the following objectives:

- **Convey the value of healthy forests:** Highlight their role in contributing to human health and well-being.
- **Educate about ecosystem services:** Inform about the crucial services healthy forests provide.
- **Promote Ecosystem-Based forest management**: Emphasize the importance of sustainable practices to maintain forest health and functionality.
- **Evoke emotional connections**: Foster deep connections between people and forests, inspiring gratitude, admiration, and appreciation for their beauty.
- **Encourage commitment and transformation**: Motivate individuals to actively support, protect, and preserve healthy forests for present and future generations.

The objective of interpretation is to influence the cognitive, emotional, and behavioural attitudes of the target audience, fostering meaningful connections and promoting positive actions towards nature.

Cognitive Objectives

Interpretation should provide opportunities for everyone to learn in an engaging, enjoyable, and rewarding manner, enhancing their understanding of the natural world.

Emotional Objectives

Effective interpretation evokes thought, reaction, and care, encouraging visitors to connect emotionally with the environment and become actively involved in its protection.

Behavioural Objectives

Interpretation has the power to influence people's behaviour inspiring actions that support conservation and sustainable practices.

Table 4 provides some examples for the cognitive, emotional and behavioral objectives for the interpretation of Healthy Forest Regions.

Cognitive, emotional and behavioural objectives for the interpretation of Healthy Forest Regions	
Cognitive	• Emphasize that healthy forests are more resilient, enabling them to withstand and recover from disturbances and the impacts of climate change. • Highlight that healthy forests provide critical habitats for diverse organisms, including rare and endangered species. • Define healthy forests as ecosystems that effectively regulate essential services, such as maintaining regional water balance and cooling the landscape. • Recognize healthy forests as natural water reservoirs, air purifiers, and temperature regulators. They also help mitigate natural hazards and serve as a source of forest-based medicines.
Emotional	• Cultivate appreciation and understanding of the importance of preserving healthy forest ecosystems. • Foster awareness of the essential role of natural cycles and processes within the forest. • Encourage delight in observing the diversity of life, including birds, mushrooms, mosses, and more. • Inspire a deeper consciousness and appreciation for the forest's aesthetic and intrinsic beauty. • Foster a sense of belonging and pride deeply rooted in the region's healthy forest heritage. • Promote feelings of hope, security, stress relief, and admiration through meaningful interactions with the natural environment. • Encourage a collective sense of belonging and stewardship within the HFR-community. • Teach relevant skills for popular outdoor activities, such as hiking, climbing, camping, and mountain biking, where permitted which promote a personal connection to nature. • Highlight and celebrate the distinctive characteristics of healthy forests, fostering deeper appreciation and care.
Behaviour	• Encourage to appreciate and safeguard the forest. • Inspire acceptance of nature's inherent "chaos" and unpredictability as part of its beauty and function. • Promote adherence to rules designed to preserve and protect the forest ecosystem. • Encourage the sharing of positive nature experiences explaining the importance of healthy forests to others. • Advocate for active support of forest protection and conservation initiatives. • Instil a sense of responsibility and stewardship for the forests. • Invite to fully immerse in the forest experience, using all senses to connect deeply with nature. • Encourage involvement in volunteer opportunities to support forest health and conservation. • Promote the benefits of visiting Healthy Forest Regions for recreation, health, and education.

Table 4: Examples for the cognitive, emotional and behavioral objectives for the Interpretation of Healthy Forest Regions (Source: HFR project)

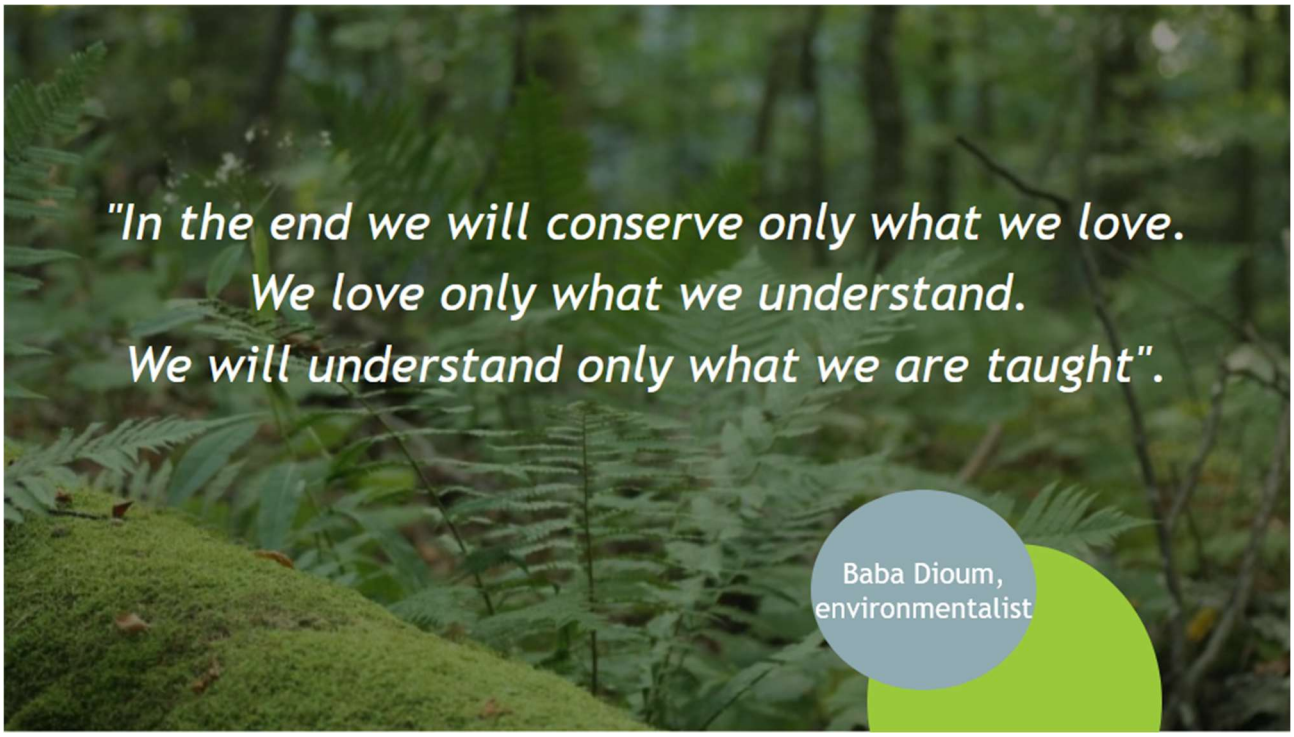

Figure 38: *Baba Dioum's advice for successful nature conservation (Source: HFR project)*

3.3. Who to interpret to?

Interpretation is a powerful tool for communicating the values of healthy forests in HFR to diverse user groups. Findings from the public survey conducted in the HFR project, which explored the relationship between forests and human well-being, provide insight into the key demographics in the project target regions in DE, CZ, SI, SK, HR, and AT. Key visitor groups of the HFR are regional residents, sports enthusiasts, including hikers and mountaineers, as well as nature enthusiasts. The least represented groups of HFR visitors are researchers, foresters, teachers and educators, as well as hunters.

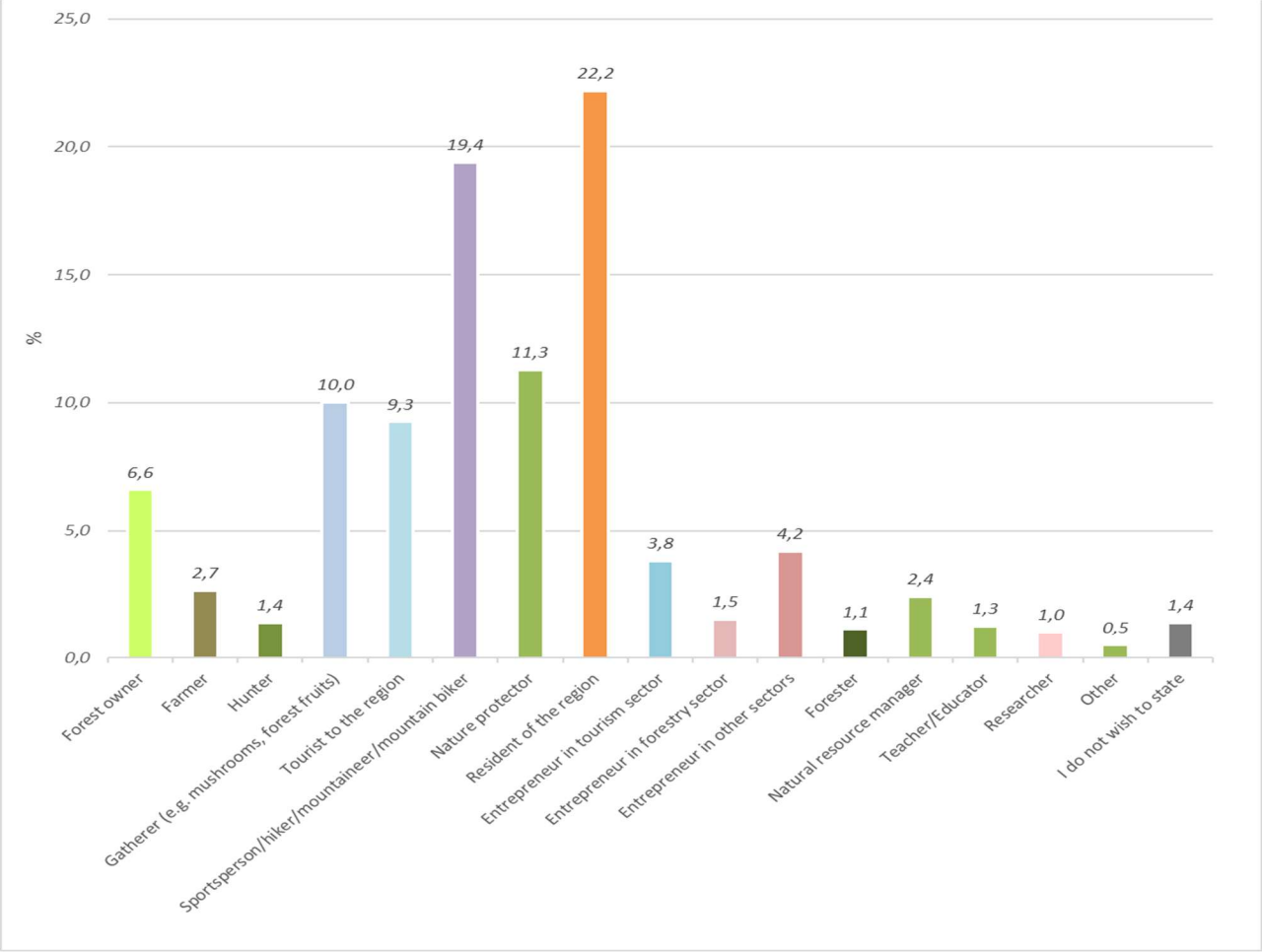

Figure 39: *Key sub-groups for interpretation planning (Source: Survey results from all project regions, August 2024)*

Interpretation activities in HFR should address the following key target groups:

1. Local Communities
Characteristics: Residents living in the region. Often rely on forest ecosystems for resources (e.g. for heating), livelihoods, or recreation.
Needs and Expectations: Access to forest resources, economic opportunities, recreation and preservation of cultural and environmental heritage.
Impact: Resource extraction, land use changes, and localized pollution.
Educational Potential: High. Tailored interpretation programs can promote sustainable practices, foster a sense of stewardship, and highlight the cultural and ecological value of the forest.
2. Tourists and Visitors
Characteristics: Domestic and international travellers seeking leisure, adventure, or cultural experiences in the forest.
Needs and Expectations: Enjoyable, safe, and informative experiences; opportunities for recreation and relaxation.
Impact: Overcrowding, waste generation, disturbance of wildlife.
Educational Potential: High. Engaging guided tours, interpretive signs, and multimedia resources can educate tourists on responsible behaviours, leaving no trace, and the ecological significance of the sites.
3. Recreational Users (e.g. hikers, bikers, motocross riders)
Characteristics: Individuals or groups engaging in outdoor activities for sport or leisure.
Needs and Expectations: Well-maintained and attractive trails, facilities, and spaces to pursue their hobbies.
Impact: Soil erosion, vegetation damage, and wildlife disturbance.
Educational Potential: Medium to high. Interpretation can encourage responsible use of natural areas, adherence to trail rules, and understanding of environmental impact.
4. Educational Institutions (students, teachers, schools, universities)
Characteristics: Students and educators involved in environmental or general education.
Needs and Expectations: Educational materials, interactive learning experiences, and access to research opportunities.
Impact: Minimal direct impact, but future behaviours may significantly influence ecosystems.
Educational Potential: Very high. Field trips, workshops, and curriculum-aligned interpretation foster lifelong environmental values and stewardship.
5. Conservation Organizations, Rangers and Volunteers
Characteristics: Individuals and groups focused on protecting and restoring natural areas.
Needs and Expectations: Resources for conservation work, collaboration with local stakeholders, and impactful engagement opportunities.
Impact: Positive, through habitat restoration and protection initiatives.

Educational Potential: High. Interpretation can deepen their understanding of ecological systems and enhance their effectiveness in advocacy and action.
6. Forestry Stakeholders
Characteristics: Forest owners and forestry workers who interact with or rely on the forest's natural resources economically.
Needs and Expectations: Economic viability, sustainable practices, and regulatory guidance.
Impact: Potentially significant, including deforestation, habitat loss, soil degradation and pollution.
Educational Potential: Medium. Interpretive programs can demonstrate sustainable methods, ecosystem value, and legal responsibilities.
7. Policy Makers and Governmental Institutions
Characteristics: Governmental institutions (e.g. municipalities) and decision-makers responsible for land management and conservation policies.
Needs and Expectations: Data-driven insights, community feedback, and successful case studies.
Impact: Indirect, but their decisions shape long-term forest ecosystem health.
Educational Potential: Medium. Interpretation can inform policy through evidence-based storytelling and on-site demonstrations.
8. Youth and Families
Characteristics: Children, teenagers, and their families exploring nature recreationally or educationally.
Needs and Expectations: Safety, fun, and engaging activities; opportunities for hands-on learning.
Impact: Minimal direct impact; high potential for fostering future environmental stewardship.
Educational Potential: Very high. Interactive exhibits, family-friendly trails, and storytelling can leave lasting impressions.
9. Special Interest Groups
Characteristics: Enthusiasts with a specific focus on certain aspects of nature (e.g., birdwatchers, botanists, amateur scientists)
Needs and Expectations: Access to information, specialized guides, and unique experiences.
Impact: Generally minimal, but overuse of sensitive areas can occur.
Educational Potential: High. Interpretation can provide in-depth knowledge, align with their interests, and promote conservation involvement.
10. Media and Influencers
Characteristics: Journalists, bloggers, and social media influencers showcasing natural areas to their audiences.
Needs and Expectations: Unique content opportunities, expert insights, and visually appealing experiences.
Impact: Potentially large if encouraging harmful behaviours or over-tourism.

Educational Potential: Medium. Interpretation can guide their messaging to highlight conservation values and responsible tourism.

Each audience group requires tailored strategies to maximize their engagement and minimize their ecological impact, making nature interpretation a vital tool for fostering sustainable relationships with the environment.

3.4 How to interpret?

When choosing tools, activities, and methods for nature interpretation, it is essential to recognize that different target groups have diverse levels of knowledge, interests, and perspectives. To effectively engage these groups, tailored communication strategies are necessary to ensure that each audience understands and connects with the message. Here's how interpretation can be methodologically adapted to specific target audiences:

- Children: Naturally curious and eager to learn, children respond well to fun, interactive activities, games, and storytelling. These methods can effectively teach them about the importance of forests and foster a lifelong appreciation for nature.
- Families: Families often enjoy outdoor activities, making it effective to highlight the recreational value of forests. Engaging, family-friendly events and experiences can inspire a shared appreciation for conservation.
- Seniors: With a deep appreciation for nature and a desire to give back to their communities, seniors can be involved through volunteer opportunities, such as forest restoration projects or educational programs.
- Educational Institutions: Teachers and professors are key advocates for environmental awareness. Collaborating with them to integrate forest education into curricula can amplify conservation efforts, e.g. through the elaboration of educational material and activities for schools.
- Forest Workers and Rangers: With their extensive knowledge of forests and management, these individuals benefit from access to the latest information, training in best practices, and resources to enhance their roles as stewards of forest ecosystems.
- Tourist Guides: As frontline educators for visitors, tourist guides play a critical role in interpreting natural and cultural heritage. Training them in interpretive guiding, storytelling, and planning enhances their impact.
- Forest Owners: Offering technical assistance and resources helps forest owners adopt and implement sustainable management practices, contributing to long-term forest health.
- Recreational Users: This group is more difficult to influence by interpretation. Effective engagement relies more on legislation, enforcement, and clear rules to regulate activities and minimize environmental harm.

Nature interpretation serves as a powerful tool to promote the development and maintenance of Healthy Forest Regions by engaging various audiences, fostering awareness, and encouraging sustainable practices. Below is an expanded list of activities that can be implemented to achieve these goals.

Interpretation Tools and Activities to Promote Healthy Forest Regions	
Educational Workshops and Guided Tours	Conduct interactive workshops and tours to highlight the tangible benefits of forest ecosystems Demonstrate sustainable practices and the interconnection between forests and human well-being
Educational Materials	Develop brochures, interpretive boards, and digital content to communicate forest ecology, ecosystem services, and conservation principles
School Programs	Integrate forest education into curricula, fostering conservation values in younger generations through interactive and age-appropriate content.
Citizen Science Projects	Engage local communities in monitoring biodiversity, tracking forest health, and participating in ecological research to promote stewardship.
Forest Guards/Rangers	Recruit and train forest guards to serve as communicators, educators, and enforcement agents, helping visitors understand and respect conservation guidelines.
Sustainable Tourism Development	Promote tourism opportunities that combine environmental education with sustainable practices, generating economic benefits for local communities.
Interpretation Training Programs	Train rangers, guides, teachers, and educators in effective interpretation techniques to maximize their impact in raising awareness.
Collaborations	Partner with governments, NGOs, and organizations to broaden the reach of interpretive programs, ensuring cohesive conservation efforts at all levels.
Info Points	Install physical or digital information stations at strategic locations, such as trailheads, parks, or community centres. Tailor content to diverse audiences, from basic education for tourists to technical updates for professionals.
Educational Boards	Use visually appealing, strategically placed boards to communicate concise, engaging information about healthy forest ecosystems and their importance for human well-being.

Guided Groups	Organize group tours led by forest experts to provide hands-on and interactive learning experiences, creating impactful and memorable connections with nature.
Brochures and Leaflets	Distribute materials that educate various audiences in a convenient and accessible format, providing detailed information and offering quick, direct messaging.
Social Media and Online Tools	Leverage social platforms to share interactive posts, videos, and updates about forest conservation, engaging and mobilizing diverse audiences.
Regional Workshops	Host workshops to engage local stakeholders, such as forest owners and forestry workers as well as policy-makers and the local population. Gather feedback to refine strategies and create innovative solutions tailored to regional needs.
Educational Trails	Design self-guided trails that provide learning opportunities about biodiversity, conservation practices, and forest health. Include interpretive signage, QR codes, and interactive elements to enhance engagement.
Mobile Applications	Develop apps to make forest education accessible, providing features like interactive maps, species identification tools, and conservation tips.

Table 5: Interpretation tools and activities to promote Healthy Forest Regions (Source: HFR Project)

The key benefits of these tools and activities are their accessibility as they ensure inclusivity for different knowledge levels, interests, and needs; engagement as they propose interactive and hands-on approaches to foster a deeper connection with nature and its importance and sustainability by involving local communities and stakeholders encouraging long-term commitment to forest health.

By employing diverse interpretive methods and activities, Healthy Forest Regions can effectively promote environmental awareness, drive positive change, and ensure forests remain healthy ecosystems for future generations.

4. Application of Interpretation Plan for HFR

The application part is typically the concluding chapter of an Interpretive Plan for a specific locality. During this stage, stakeholders come together to discuss and strategize the most appropriate activities and tools for implementing the Interpretation Plan. Recommendations for suitable activities are outlined in chapter 3.

In the framework of the Healthy Forest Regions project, pilot activities were selected by the participating project partners and will be conducted across the project regions to test and refine the following interpretive activities:

- **Interpretive Trainings:** Focused on interpretive planning, guiding, and writing for effective nature interpretation.
- **Forest Classrooms**: Installation of outdoor places of learning within forest environments for school classes for educational activities.
- **Educational Packages for Schools**: Tailored materials designed to bring forest conservation topics into the school curricula.
- **Forest Guards:** Enhancing visitor communication and awareness within forests.
- **Nature Therapy and Recreation Offers**: Activities leveraging the therapeutic and recreational benefits of healthy forest environments.
- **Tourism Packages:** Touristic offers which combine regional services (accommodation, catering, recreational offers, regional products) focusing on forests and their contributions to human health and well-being.

As a result, two guideline documents will be produced to inform, inspire and incentive other forest regions to conduct similar activities to promote the development of Healthy Forest Regions:

1) Good practise guide for the integration of knowledge about functional forest ecosystems and their services to human well-being in HFR into educational work
2) Good practise guide for the creation of secondary benefits for local stakeholders thriving on the contributions of regional healthy forest ecosystems to human well-being in HFR

List of figures and tables