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HealthyForestRegions

Healthy Forest Regions Concept

A forest-based regional development concept to safeguard the future capital of forest-rich regions

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The *HealthyForestRegions Project - Supporting Healthy Forest ecosystems for human well-being in forest regions* (CE0100310) operates under Interreg CENTRAL EUROPE's 2021-2027 funding. It is aligned with Priority 2 '*Cooperating for a greener Central Europe*', and addressing Objective 2.4, '*Safeguarding the environment in Central Europe*'. The project spans form April 2023 to March 2026, with a budget of €2.78 million, of which 80% are funded by ERDF. Involving nine partners across six Central European countries with six project regions, the project fosters commitment among policy- and decision-makers to maintain and create conditions that support the health of the regional forest ecosystems. Thereby, the *HealthyForestRegions Project* supports the long-term well-being of the people living, working and spending time in the targeted regions.

Acknowledgements

The *Healthy Forest Region Concept* is the result of many contributions, discussions, and shared efforts. We would like to thank all project partners, associated partners, and cooperating partners who have supported and shaped this work through their expertise, ideas, and engagement. Our gratitude also extends to everyone who helped give life to the *HFR* idea and to those who remain committed to nurturing and advancing it in the future.

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A. CONTEXT & RELEVANCE

1. Context & need for action in forest-rich regions

Forest-rich regions hold a unique and irreplaceable potential: their forests provide a wide range of ecosystem services — such as regulating water cycles and climate, sequestering and storing carbon, purifying air, maintaining soil fertility, mitigating natural hazards, providing raw materials, and offering spaces for recreation, education, and cultural inspiration. Together, these services form an essential foundation for human well-being as well as for social, cultural, and economic development.

However, climate change, recurring heatwaves and droughts, intensive land use, and landscape fragmentation are placing growing stress on forest ecosystems. Even previously stable forests are showing signs of declining vitality and increasing vulnerability to bark beetle outbreaks, wildfires, and extreme weather events. When forests lose functionality, the consequences extend far beyond economic losses for forest managers or owners. They affect society as a whole - impacting water availability, public health, regional economies, and long-term development prospects.

Safeguarding forest health is therefore not solely a forestry concern, but a strategic task for regional governance and collective action. Anticipating and addressing these risks and consequences, requires collective responsibility and well-informed, cross-sectoral decisions.

The *Healthy Forest Regions (HFR) Concept* provides a practical framework for regional actors to respond to these pressures while unlocking the full potential of their forests. It shows how forests can become strategic assets for sustainable regional development, health, and quality of life, and offers guidance, practical options, and strategies for decision-makers, local authorities, educators, forest managers, and community stakeholders. Being a *Healthy Forest Region* is not a status to be achieved but a commitment to align policies, decisions, and actions with the long-term resilience and functionality of forest ecosystems.

This concept paper serves as a roadmap. It explains principles, criteria, and practical pathways to embark on the path of a *Healthy Forest Region*, demonstrating how regional policies can be designed, communities engaged, and economic, social, and ecological benefits maximized simultaneously. Through lighthouse projects, communication strategies, and participatory approaches, it provides tools that regions can adapt to their local context.

In short, the *HFR Concept* helps forest-rich regions to:

- Preserve and enhance forest health and ecosystem services for current and future generations.
- Leverage forests as regional capital for economic development, well-being, and identity.
- Engage decision-makers, stakeholders, and communities in participatory processes that create ownership and shared responsibility.
- Translate scientific knowledge into actionable strategies tailored to regional realities.

By following this guidance, forest-rich regions can strengthen resilience, create tangible benefits for residents and visitors, and secure their forests as a cornerstone of long-term regional prosperity. The *Healthy Forest Regions Concept* is both a vision and a practical toolkit — a starting point for forest-based sustainable development.

1.1. Emerging risks and pressures – Challenges for forest health and regional well-being

Despite their immense value, forests are often taken for granted as long as they appear stable and intact. The vulnerability of forest ecosystems becomes visible only when damage is sudden and severe: after extreme droughts, storms, pest outbreaks, or wildfires, when hectares of forest that have been passed down for generations decline or disappear within a few years or less. Such events raise fundamental questions: How could this happen? Could it have been anticipated? And how is it affecting us, as a forest-rich region, in the long term?

Under appropriate conditions, forests buffer heat and contribute to local cooling, remaining significantly cooler than surrounding agricultural or urban areas during heat events. In recent years, however, marked by repeated heatwaves and low precipitation, even formerly well-functioning forests have increasingly exhibited elevated temperatures and declining greenness (Box 1). This suggests that the regulating capacities of forest ecosystems are being placed under growing pressure. These effects occur across many regions but are particularly evident in highly fragmented landscapes, in forest areas influenced by strong edge effects, and in structurally simplified stands such as extensive conifer-dominated forests on dry or nutrient-poor sites. Under such conditions, heat stress intensifies, soil moisture declines, and forests become more susceptible to drought, fire or the outbreak of insects and pathogens.

Box 1: The state of health of European forest ecosystems and their future prospects

Climate change increasingly drives ecosystemic stresses.

Climate change has started to impact ecosystems and Europe, and it is projected to further intensify drought, storms, fire, pests and root rot, especially in Central and Southern Europe, raising economic losses and risk to ecosystem services (Vacek et al., 2023; Lindner et al., 2010; Romeiro et al., 2022; Knutzen et al., 2025; Mohr et al., 2025).

A Europe-wide analysis back to 1766 identifies the 2018–2020 drought as a "new benchmark": unprecedented intensity, mean areal coverage 35.6%, and average duration 12.2 months, with an extraordinary +2.8 K near-surface temperature anomaly (Rakovec et al., 2022). For Central Europe, the 2014–2018 multi-year period shows record soil-moisture drought severity in a 253-year record, despite 2018 alone not being the absolute worst single year (Moravec et al., 2021). A reconstruction since 1766 finds the 2018–2019 consecutive summer drought unprecedented in 250 years, with stronger vegetation impacts than the famous 2003 drought (Hari et al., 2020). A European wide analysis conducted from 1901–2019 flags the time range from late 2018 to mid 2019 as the driest period in central Europe. (Ionita & Nagavciuc, 2021).

Analyses of extremes show emerging new climate extremes over Europe since ~2000, especially for heat and drought-related indices (Ossó et al., 2021). Drought projections indicate more frequent and severe events across much of Europe under continued warming, with extreme multi-year events like 2018 expected to become more common, especially under high emissions (Spinoni et al., 2018; Rakovec et al., 2022; Hari et al., 2020; Van Der Wiel et al., 2022; Van Der Wiel et al., 2021).

Especially, the 2018–2022 events showed forests in all European regions suffered reduced vitality, severe defoliation and lasting damage; even "resilient" systems are now at clear risk of severe decline (Knutzen et al., 2025; Schuldt et al., 2020).

Combined abiotic and biotic disturbances mean increasing pressure on ecosystems and forestry.

Wind, fire and bark beetles have increased strongly since 1950, causing ~44 million m^3 disturbed timber per year; in recent decades, disturbances equal ~16% of annual harvest (Patacca et al., 2022). Vulnerability to fires, storms and insects is highest at climatic margins in both south and north Europe (Forzieri et al., 2021). About 10–12% of timber, carbon storage, soil erosion control and recreation potential was said to be at risk from windthrow, beetles and wildfire; soil-erosion control is most threatened (Lecina-Diaz et al., 2024). Historical conifer monocultures and low heterogeneity increase disturbance vulnerability; more diverse structure could cut biomass loss by ~18% (Forzieri et al., 2024; Vacek et al., 2023). One-third of European forest area shows declining condition (e.g., loss of soil carbon, tree cover, threatened birds) despite overall area gains (Maes et al., 2023); fragmentation and infrastructure reduce habitat quality and connectivity (Hernández-Morcillo et al., 2022; Marín et al., 2021). Eutrophication and soil acidification continue undermining forest health and long-term nutrient balance, interacting with climate stress (Maes et al., 2023; Du et al., 2025).

Human-driven disturbance from land use now exceeds natural disturbance.

It refers to reshaping structure and increasing climate sensitivity, and managed stands in Europe are on average younger, more conifer-dominated, and store about half the carbon of unmanaged forests, indicating reduced buffering capacity (Ferretto et al., 2025). Intensive, uniform management is especially linked to higher disturbance risk and reduced carbon storage, making forests more vulnerable to heat, drought, wind and insects (Lindner et al., 2010; Forzieri et al., 2021; Ferretto et al., 2025). For example, opening canopies through logging measurably warms forest microclimate during heatwaves; felling 100 trees/ha raised maximum near-ground temperature by ~0.2–0.5 K [≈0,2-0,5 °C], and low canopy cover plots were up to 9–13 K [≈9-13 °C] hotter than dense, beech-rich stands, amplifying drought stress (Blumröder et al., 2021).

Policy challenges and management options discussed in recent scientific literature.

Simultaneously maximizing timber, carbon sinks, biodiversity protection and stable harvest leaves “only limited options”; optimized portfolios lack diversity and increase regional risk (Gregor et al., 2024).

The key challenges to forest ecosystem health in Europe arise from interacting climate-driven drought, disturbance regimes and use-influenced vulnerability, reduced management “option space,” ongoing degradation and fragmentation, and pollution. Addressing these issues requires changes to problematic forestry practices, as well as more effective and harmonised monitoring and policies that realistically balance all ecosystem services while maintaining the best possible forest resilience and adaptive capacity.

Increasing ecosystem heterogeneity (more tree-species and size diversity) could reduce biomass loss from climate-driven disturbances by ~18% at EU scale (Forzieri et al., 2024). Mixed, structurally diverse, “close-to-nature” silviculture and species-diverse, uneven-aged stands are repeatedly recommended to improve resistance and resilience to drought, pests and storms (Vacek et al., 2023; Huth et al., 2025; Mina et al., 2017; Blattert et al., 2024; Forzieri et al., 2024). Maintaining dense, deciduous-rich canopies (>~80% cover) enhances temperature buffering and reduces heat stress (Blumröder et al., 2021). Commonly, adaptive strategies — climate-resilient species/provenances, longer regeneration periods, and region-specific management regimes — are highlighted as crucial for sustaining ecosystem services under climate change (Vacek et al., 2023; Huth et al., 2025; Augustynczik et al., 2025; Mina et al., 2017; Wessely et al., 2024).

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When forests lose their functionality, the consequences influence entire regions: local climates become hotter and drier, water regulation deteriorates, biodiversity declines, recreational value decreases, and risks to public health and regional economies increase. This creates a critical challenge for regional governance. While forest ownership may be private or public, the benefits of healthy forests — and the costs of their decline — are shared widely. Forest health is thus a matter of public interest.

Ensuring resilient and functional forest ecosystems requires coordinated action across policy fields such as forestry, water management, spatial planning, health, tourism, education, and regional development. This is particularly important because current challenges stem from long-term land-use legacies combined with rapidly accelerating climate change, rather than from individual management decisions.

If this responsibility is not actively assumed, regions risk becoming passive observers of a gradual but profound loss of natural capital. Without clear priorities, long-term strategies, and supportive institutional frameworks, forests may no longer be able to fulfil the functions on which regional well-being depends. Conversely, addressing these challenges proactively opens a window of opportunity: by acting early, regions can reduce risks, strengthen resilience, and secure the ecological foundations of their future development.

The *Healthy Forest Regions Concept* responds directly to this challenge. It offers orientation on how to translate awareness of risks into concrete, politically feasible action — by aligning forest health, ecosystem services, and human well-being as shared priorities of regional development.

1.2. Regional forests as future capital - Opportunities and benefits of the *HFR Concept*

Especially old and structurally rich forests are complex ecosystems developed over decades, centuries, or millennia. They cannot be created quickly, replicated through investment, or restored within political or funding cycles. Their value lies precisely in this long-term development: only over extended timeframes can forests provide the full range of ecosystem services that sustain human well-being. If preserved in a healthy and functional state, forests become a unique form of future capital: they continuously generate benefits for present and future generations, even in times of crisis. Engaging for the implementation of the *HFR* idea and application of the *HFR Concept* sustainably supports the long-term provision of these forest-related benefits across society:

a) Strategic value for local and regional policy-makers

For policy- and decision-makers, the *Healthy Forest Regions Concept* provides strategic orientation in times of growing uncertainty. It offers a coherent framework for addressing interconnected challenges such as climate change, declining forest health, rural depopulation, shrinking job opportunities, and weakening regional identity. By placing forests at the centre of development strategies, decision-makers can sharpen the regional profile and enhance attractiveness as a place to live, work, and visit. At the same time, the *HFR* approach strengthens governance by promoting cooperation across municipalities, sectors, and administrative levels, enabling coordinated responses to crises and long-term challenges alike.

b) Opportunities for land and forest owners

Because forests within an *HFR* are owned by a wide range of actors — private individuals, municipalities, associations, foundations, and state institutions — the concept provides a shared framework for aligning ecological and economic interests. Forest owners benefit from structured exchange, peer learning, and closer links to policy-makers and regional stakeholders, strengthening their collective voice and visibility. By promoting ecosystem-based forest management and the sustainable use of forest ecosystem services — such as recreation, tourism, carbon storage, or educational and health-related services — the *HFR Concept* opens opportunities to diversify income beyond timber. Political backing and scientific guidance further support owners in adopting nature-oriented practices without competitive disadvantages, particularly benefiting small or less experienced forest owners.

c) Impulses for the local and regional economy

Small and medium-sized enterprises, tourism operators, recreational service providers, local vendors, and gastronomy businesses benefit directly from strategies that strengthen sustainable regional development and place the forest at the core of the regional profile. Resilient forest ecosystems help stabilise long-term supplies of timber and non-timber forest products such as berries, mushrooms, and herbs. At the same time, targeted communication and regional positioning increase visibility and demand for regional products and forest-related services. Forest-based recreation and tourism become more reliable economic pillars when ecologically sensitive areas are protected and large-scale forest decline is avoided. Where land-use interests compete, the *HFR* framework supports cooperative planning and shared objectives, helping to reduce conflicts and secure long-term regional value creation.

d) Benefits for residents and communities

For residents, healthy and resilient forests translate directly into quality of life. Functional forest ecosystems provide cooling during heatwaves, regulate water availability, reduce risks from natural hazards, and offer accessible spaces for recreation, relaxation, and everyday well-being. Forests also serve as places of learning and cultural continuity, supporting environmental education, intergenerational knowledge, and regional identity. By creating new forest-related employment opportunities in areas such as tourism, education, health, and sustainable forestry, the *HFR* approach contributes to regional economic stability and offers young people perspectives for the future. Participatory processes further strengthen social cohesion and empower communities to actively shape regional development.

e) Added value for forest and protected area administrations

Within a *Healthy Forest Region*, forest and protected area administrations benefit from stronger political and societal recognition of their work. Increased awareness among residents and visitors fosters greater acceptance of protection measures and more responsible behaviour in forests, reinforcing the public mandate for conservation and sustainable management. The *HFR* approach also improves governance and coordination by strengthening links between administrations, policy-makers, and related sectors such as tourism, education, spatial planning, and regional development. Access to scientific data, monitoring results, and new management approaches supports evidence-based decision-making and enhances the capacity of administrations to safeguard forest ecosystem services in the long term.

By taking responsibility now, regions can turn the challenge of climate change and landscape transformation into an opportunity: for resilient ecosystems, a strong local economy, and communities actively shaping their future. Healthy forests thus become not just a natural legacy, but a shared regional asset supporting human well-being, socio-economic development, and cultural identity. The *Healthy Forest Regions Concept* provides guidance, practical orientation, and examples of tested approaches, helping regions move from evidence to action — and from individual decisions to collective responsibility.

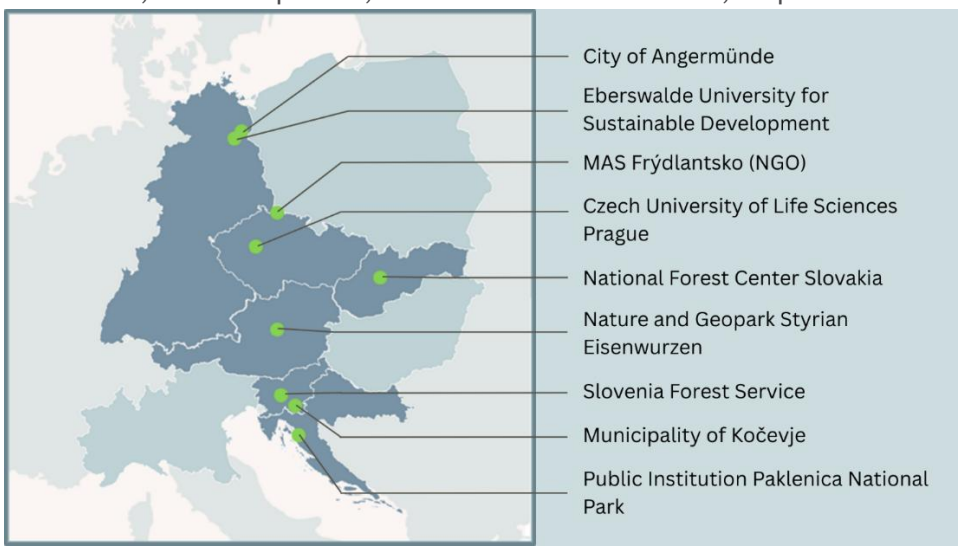
2. Framework of the *HFR Concept*

The present concept was developed within the framework of the *HealthyForestRegions (HFR) Project*. It brings together the project's results in a single, coherent document and embeds them within a broader conceptual framework: the idea of a *Healthy Forest Region*.

The following chapter introduces the *HFR Project*, discusses its background, and explains how the *HFR Concept* was developed methodologically within the project.

2.1. *HealthyForestRegions Project*

The project *HealthyForestRegions (HFR)* was funded under *Interreg CENTRAL EUROPE* from April 2023 to March 2026. This European Union funding program brings together municipalities, businesses, and civil society organizations in Central Europe to work across borders on forward-looking projects. The project was implemented under Priority 2: *"Cooperation for a Greener Central Europe" and the specific objective 2.4: "Protecting the Environment in Central Europe."* With a total budget of 2.78 million Euros, of which 80% is financed by the European Union, the *HFR Project* unites nine partners from six countries — including universities, municipalities, forest administrations, protected areas, and an NGO.



Map of the total project area and related partner organisations

The aim of the *HealthyForestRegions Project* was to engage policy makers and key stakeholders in strengthening forest health in order to secure long-term human well-being in forest regions. The project supported sustainable regional development in six pilot regions to make both regional forests and the project regions more resilient in the long term.

Project regions	Project partners

Schorfheide-Chorin-Odertal (DE)	Eberswalde University for Sustainable Development (HNEE)
	City of Angermünde (AC)
Jizerskohorské bučiny (CZ)	LAG Frýdlantsko (MASiF)
	Czech University of Life Sciences Prague (CZU)
Poloniny (SK)	National Forest Centre (NLC)
Natur-und Geopark Steirische Eisenwurzen (AT)	Nature and Geopark Styrian Eisenwurzen (NUP)
Kočevsko (SI)	Slovenia Forest Service (SFS)
	Municipality of Kočevje (MK)
Velebit Mountains (HR)	Public Institution Paklenica National Park (PNP PI)

Overview of the six defined project target regions and related partner organisations

The project was structured around three core fields of action addressing the following thematic areas:

- Working field one: Promotion of forest ecosystem-based sustainable regional development for human well-being in *HFR*
- Working field two: Reimbursement systems for forest ecosystem services - exploring and implementing new opportunities
- Working field three: Developing operational frameworks for safeguarding forest ecosystem functionality in *HFR*

At an operational level, the project outputs from the three working fields are intended to promote practices and decision-making approaches that contribute to the long-term conservation of forests and to the sustained provision of their ecosystem services for human well-being. Chapter 6, '*Guiding Action Principles for Implementing the HFR idea*', and Chapter 7, '*HFR lighthouse projects*', further classify the individual results of the working fields and illustrate how they contribute to the practical implementation of the idea of a *Healthy Forest Region*.

Background of the *HealthyForestRegions Project*

The *HFR Project* was part of a long line of scientifically guided practical projects. It was directly linked to the creation and expansion of the UNESCO World Natural Heritage site *Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe*, which began in 2007. With 94 individual sites across 18 countries, the World Heritage Beech Forest Network is the most complex transnational natural heritage site in UNESCO's global portfolio. The direct predecessor of the *HFR Project* focused explicitly on the World Heritage Beech Forest areas and was called *BEECH POWER – "emPOWERing and catalyzing an ecosystem-based Sustainable Development"* (2019–2022). At that time, the project area covered nearly 25% of the

individual beech forest sites, spread across five countries (Austria, Germany, Croatia, Slovakia, and Slovenia). *BEECH POWER* followed an ecosystem-based and participatory approach to integrate the World Heritage sites into sustainable regional development and to create transferable solutions for the management of the UNESCO beech forests. The *HealthyForestRegions Project* significantly broadens this focus: First, it brings forests in general into the centre of attention. Second, it adds the dimension of the value of regional forests for human health and well-being.

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: https://www.europeanbeechforests.org/world-heritage-beech-forests/our-beech-forest-family, accessed on 19 February 2026)

2.2. Development process of the *HFR Concept*

One major goal of the *HFR Project* was to concretise and conceptualise the idea of *Healthy Forest Regions* based on experiences in the six target areas. This was achieved through a common understanding developed between the nine project partners and their regional associates.

2.2.1. Working formats and methodology

In order to develop such a common understanding among the nine international project partners and their regional associated partners, and to elaborate on the *HFR* idea as well as the content of the *HFR Concept* the following formats and methodologies were applied:

- Online workshops supported by visual collaboration tools and a story-based visual framework

- Project meetings in person with moderated discussions, consensus-based live collaborative drafting sessions, thematic working groups and role plays
- Online selection and prioritisation tools
- Shared online documents

2.2.2. Thematic working phases

Six main steps can be identified as crucial for developing the *HFR* idea. They form the foundational pillars on which the *HFR Concept* has been built:

1. **HFR Interpretation Plan**

   The initial step in developing the *HFR* idea and *HFR Concept* was the elaboration of a *General Interpretation Plan* specifically tailored to potential *Healthy Forest Regions* and corresponding regional Interpretation Plans for selected project regions. One core and four key messages of *HFR* where formulated and a first understanding of the idea of a *HFR* was drafted. Further, important actors and stakeholders were identified as part of the target group definition.

2. **Definitions of "*Healthy Forest Region*" & "Healthy Forest"**

   In a second step a definition of "Healthy Forest" as well as of a "*Healthy Forest Region*" was jointly developed by the project team. Both were revised later in the project.

3. **Binding Criteria, Principles of Action**

   Starting with the project regions, key elements of *Healthy Forest Regions* were first identified for each region and then gradually brought together to form a common understanding of the *HFR Binding Criteria* on the one hand and important *HFR Action Principles* on the other. After the initial draft of the *Binding Criteria* had been drawn up, its wording, suitability and feasibility were thoroughly reviewed for all project target regions and revised accordingly. The *Action Principles* were strongly aligned with the project content and expected results, but are not limited to these. However, it was ensured that all project results and products are covered in the principles. Some principles could be underpinned with more concrete content from project results than others.

4. **Actors and benefits**

   The initial findings on key stakeholders and interest groups, which were incorporated into the *Interpretation Plan*, were supplemented by a more detailed discussion of specific stakeholders and the benefits that an *HFR* could bring them. Potential risks and concerns were also explored.

5. **Basic assumptions**

   In order to strengthen and consolidate a common understanding of forest health and supporting forest management, basic assumptions were formulated, discussed and refined during the course of the process.

6. **International *HFR* network**

   In the final step, discussions focused on how an international *HFR* network could be established on a sustainable basis and what long-term purposes it should and could serve in line with the *HFR* idea.

These six core content pillars were then integrated into a coherent concept through the contributions of the various project partners and working groups. In this process, the *HFR Criteria and Principles* were further refined, and the chapters on HFR lighthouse projects (see Chapter 7), and communication strategies (see Chapter 8) were developed.

3. Specification of the *HFR* idea

What is a *Healthy Forest Region*? What vision does this idea pursue? What are the core and key messages of the *HFR* idea? And what underlying concepts and terms form the foundation on which the *HFR* idea unfolds?

3.1. Definition of an *HFR*

In the context of the *HFR Project*, two definitions of a *Healthy Forest Region* have been developed. These definitions are closely linked to the *HFR Binding Criteria* which are presented in Chapter 5.

a) **General definition:**

A *Healthy Forest Region (HFR)* is a forest-rich region that has a high share of healthy forest and is supported by an international network. In this region, the diverse forest ecosystem services are acknowledged as indispensable for human well-being and regional resilience under unavoidable social-ecological changes. Key actors in the *HFR* specifically commit to the conservation and promotion of forest health.

b) Short definition:

A *Healthy Forest Region* unites inhabitants, forest owners and managers, municipalities and other institutions in a certain region to become one joint force to maintain and increase forest health as an important basis for human well-being.

3.2. Shared guiding vision

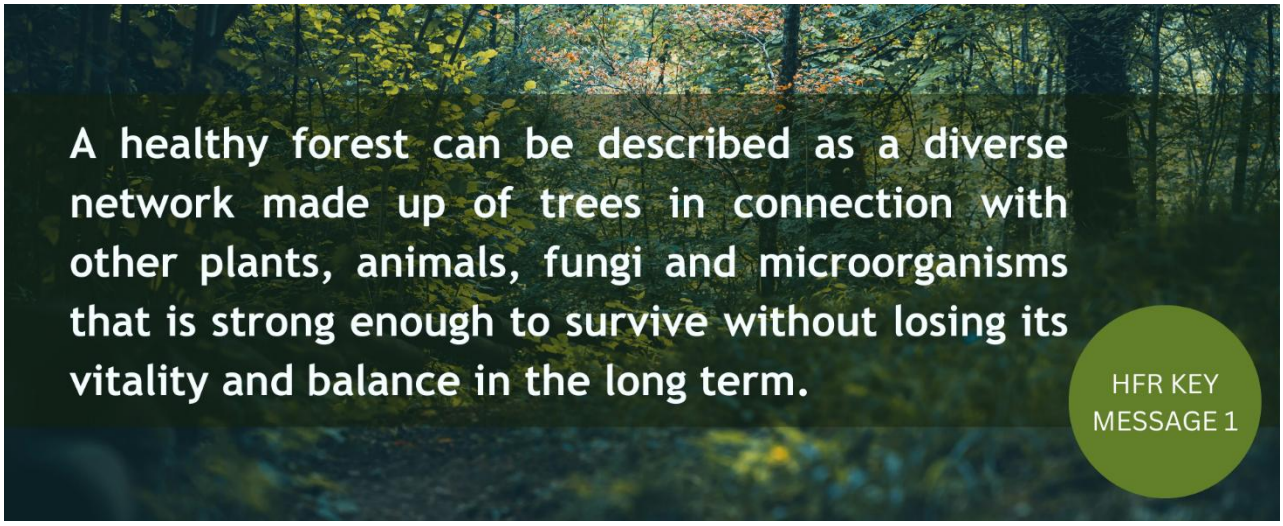
Being a Healthy Forest Region (HFR) is not a fixed status but a deliberate choice and commitment for a path that a forest-rich region decides to follow. On this path, the region recognizes the natural wealth of healthy forests as vital future capital and acknowledges the ecosystem services these forests provide as essential for human well-being. Accordingly, regional policymakers and stakeholders work actively together as a network to preserve and enhance the health of local forests. By creating conditions that allow forests to endure and regenerate, the region opens up new opportunities for its own development: it strengthens its identity as an attractive alternative to urban-industrial lifestyles, takes responsibility for its natural heritage, and establishes itself as a forward-looking, inspiring place in an era of climate change. An HFR joins with other European regions in making the shared decision to embrace a privilege that few regions possess—a privilege that will erode without active commitment.

3.3. *HFR* Core & Key Messages

In order to make the *HFR* idea tangible and explicit, one core message and four key messages have been developed as part of the *HFR Interpretation Plan*. These messages can be used to communicate the *HFR Concept* explaining it to different stakeholders.

Core message of the HFR Interpretation Plan © photo by Megan O'Hanlon

Key Message No. 1: What is a healthy forest?



HFR Key Message No. 1, © photo by Cameron Mourot

Key Message No. 2 - How do humans benefit from healthy forests?

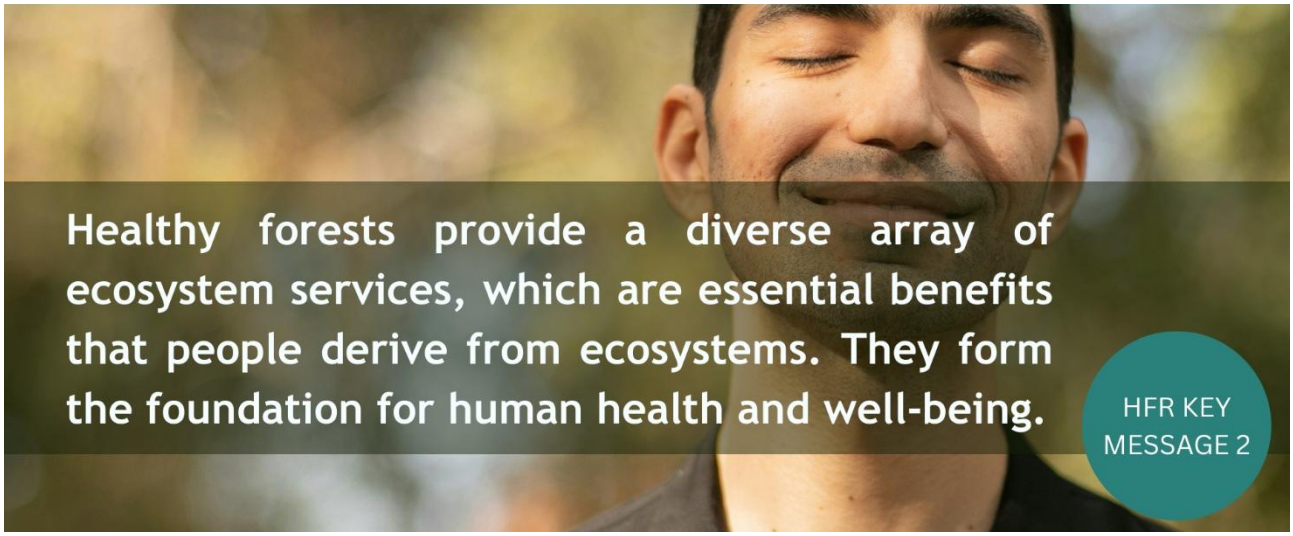
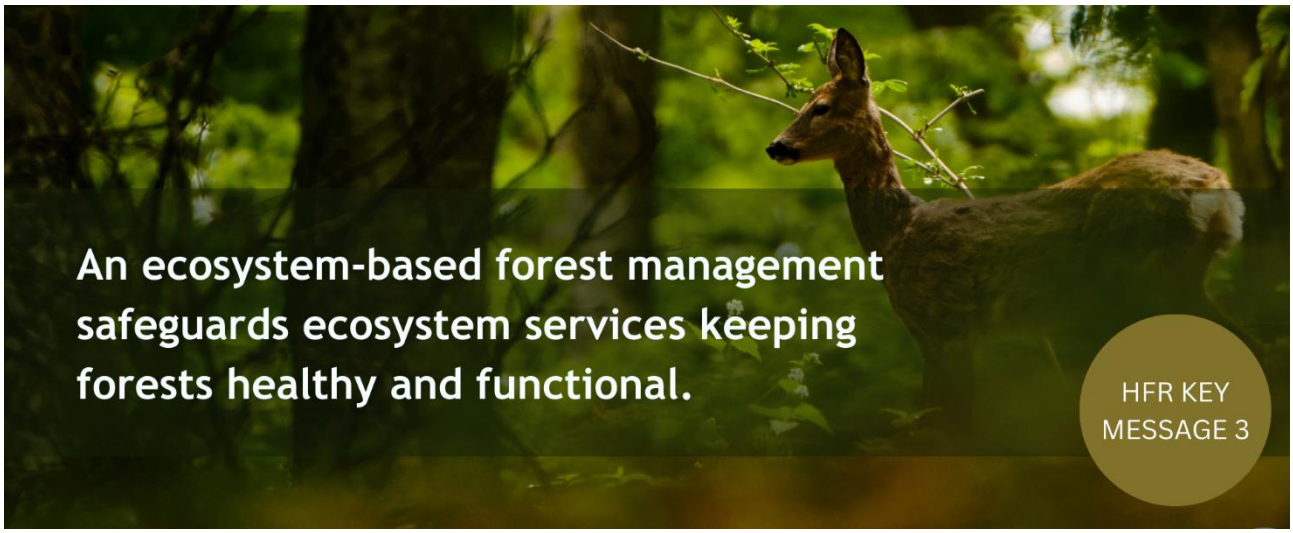


Figure 1: HFR Key Message No. 2, © photo by Alexis Baydoun

Key Message No. 3 - What can be done to keep forests healthy?



HFR Key Message No. 3, © photo by Yuriy Mayatniko

Key Message No. 4 - How can an *HFR* benefit from its healthy forests?

Figure 2: HFR Key Message No. 4, © photo by HFR Project

3.4. Underlying concepts and terms

The following chapter outlines concepts and terms building the theoretical foundation of the *HFR* idea required for the further understanding of the concept.

3.4.1. *One Health* approach

The *HFR* Core Message: "Benefits to forests are benefits to people" is directly linked to the *One Health* approach which the *HFR Project* was inspired by. This approach views the health of humans, flora, and fauna as inseparably connected. Only when these three dimensions remain in balance can long-term well-being and quality of life be secured. Forests play a central role in this balance: they provide clean air, store water, regulate the climate, and serve as habitat for an enormous diversity of species. Healthy forest ecosystems are therefore not only the foundation of biodiversity but also of human health. Protecting and strengthening forest health is thus a key contribution to realizing the *One Health* concept.

3.4.2. *HFR* healthy forest definition

At the heart of the *HFR* idea is the concept of a "healthy forest". Since there is no universally accepted definition of what constitutes a "healthy forest," the term was defined within the framework of the *HFR Project*. One of the developed definitions was reflected in the first key message; it is complemented by two additional versions, one suitable for scientific audiences and the other for close-to-experience educational work:

a) Short definition (Key Message No. 1)

A healthy forest can be described as a diverse network made up of trees in connection with other plants, animals, fungi and microorganisms that is strong enough to survive without losing its vitality and balance in the long term.

b) Scientific *HFR* definition

'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 largescale

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.'

c) Figurative definition

'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.'

3.4.3. Forest ecosystem services

As described in Key Message No. 2, "Healthy forests provide a diverse array of ecosystem services, which are essential benefits that people derive from ecosystems. They form the foundation for human health and well-being." the concept of ecosystem service is essential to the *HFR* idea. As an *HFR*, a region aims at ensuring a higher provision of forest ecosystem services compared to other regions. In accordance with the *Common International Classification of Ecosystem Services* (*CICES*) the forest ecosystem services that are potentially provided in an *HFR* are classified as followed. In Chapter 6.2, '*HFR Principle No. 2: Forest ecosystem services*', and Chapter 7.2, '*Lighthouse projects - Ecosystem services & alternative income'* the role of ecosystem services within the *HFR* framework is further specified.

Categorisation and listing of forest ecosystem services based on CICES

Forest ecosystem services in *Healthy Forest Regions*	
Regulating services	▪ Mediation of nuisances of anthropogenic origin (smell & noise reduction, visual screening) ▪ Erosion control ▪ Hydrological cycle and water flow regulation ▪ Hazard mitigation - mass movement (incl. landslides, rocks, snow) ▪ Hazard mitigation - flood and storm surge mitigation ▪ Hazard mitigation - wind protection ▪ Hazard mitigation - fire protection ▪ Lifecycle maintenance, habitat, and gene pool protection (incl. pollination; seed dispersal; nursery, breeding, and refuge habitats; feeding grounds) ▪ Pest and disease control ▪ Regulation of soil quality (incl. decomposition and soil structure) ▪ Water conditions (water quality) ▪ Regulation of temperature and humidity, including ventilation and transpiration at local scales (i.e. cooling effects)
	▪ Source of food (e.g., meat, mushrooms, forest fruits, etc.)

Provisioning services	▪ Source of construction timber Source of wood for other uses (paper, wooden materials, etc.) ▪ Source of fuel (e.g., fuel wood, pellets, chips, etc.) ▪ Medicinal resource ▪ Clean water availability
Cultural services	▪ Leisure and sports (e.g., walking, cycling, jogging, rock climbing, dog walking, etc.) ▪ Recreation, relaxation, and recovery ▪ Landscape-shaping element (e.g., aesthetics, cultural landscape) ▪ Spiritual place (e.g., sense of a place, religious place) ▪ Place of learning (e.g., education, guided tours, research, etc.)

3.4.4. *HFR* forest management approach

As expressed in Key Message No. 3, "An ecosystem-based forest management safeguards ecosystem services, keeping forests healthy and functional," a suitable forest management approach is key in order to implement the *HFR* idea. To specify what such an approach could look like, eleven *Basic Assumptions* have been formulated by the *HFR Project* consortium. In addition, Chapters 6.1 '*HFR Principle No. 1: Forest management*' and Chapter 7.3 '*Lighthouse projects - Forest health & regional planning*' further concretise this topic.

HFR Forest Management - Basic Assumptions

Assumption 1	Forests are complex, dynamic ecosystems within a broader ecological, climatic, and socio-cultural context.
Assumption 2	Forest management that supports forest health operates at both the forest and landscape level and at different levels of complexity and time.
Assumption 3	The health of a forest increases with ecosystem-based, close-to-nature management, education, communication and a common vision. As essential forest structures, functions and relations become degraded, forest health declines accordingly.
Assumption 4	Forests have a positive impact on both, physical and mental human health. Strengthening forest health enhances overall human well-being.
Assumption 5	The healthier the forest is, the higher the potential provision of ecosystem services.
Assumption 6	Wood remains an important renewable resource for human well-being.
Assumption 7	Intensive/not adapted to site conditions timber harvest can cause deterioration of forest health.
Assumption 8	To safeguard forest health and maintain essential ecosystem services, wood production and other human interventions must be ecologically responsible and adapted to site-specific vulnerability.
Assumption 9	Beyond timber production, forests offer a wide range of alternative income opportunities on ecosystem service markets.
Assumption 10	An effective *HFR* forest management approach aims to: a) preserve what is good b) reduce what is harmful, and c) target what is lacking.

Assumption 11	Virgin forests should remain untouched.

B. IMPLEMENTATION & GOVERNANCE

The second main part of *the HFR Concept*, "Implementation & Governance," presents how the *HFR* idea can be implemented in practice. It explains what a regional *HFR* network looks like, which criteria must be fulfilled to be an *HFR*, which action principles an *HFR* commits to, which concrete actions and activities can bring the *HFR* idea to life, and which communication strategies can be applied, followed by a future outlook.

4. Regional *HFR* network – roles & responsibilities

The *HFR* idea relies to a particular extent on actors within a region coming together in a network and engaging collectively around the shared goal of regional forest health. For the initiation of adopting the *HFR* idea in a region, there are certain actors who are particularly well suited for this role; these fall under the category of "initiating actors". To establish and implement the idea in practice over the long term, additional actors are required — the "supporting actors". On both levels, it is advisable to also include a funding organisation/institution in order to have appropriate resources to establish/continue organisational and administrative structures supporting the development of an *HFR* as well as to finance concrete regional engagement.

4.1. Initiating actors

Within the *HFR Project*, it became clear that regional (a) political institutions, (b) institutionalised actors, and (c) land or forest owner associations are particularly suitable for initiating the process of a *Healthy Forest Region*. These actors may share, among other things:

- their significant influence within the region,
- a democratically or otherwise legitimately conferred mandate,
- available or potentially fundable financial and human resources to bear the effort,
- ownership of or influence over large areas of forest, and
- expertise in forestry and/or nature conservation.

These initiating actors may include:

Municipalities & other public administrational units
Public state/regional institutions (e.g. protected areas, forest administration, nature protection agencies)
Land or forest owner associations
Academic & research institutions
Local communities
Environmental NGOs & local action groups
Public enterprises (e.g. state forest enterprise, water companies)

4.2. Supporting actors

The group of actors that further support and implement the *HFR* idea in the long term almost entirely includes the initiating actors and is mainly supplemented by less institutionalised actors/stakeholders, such as:

Residents
Forest managers
Private forest owners
Wildlife managers
Educational actors, groups, and institutions
Tourist associations, boards, and entrepreneurs
Leisure organisations, (e.g. sports clubs)
International institutions providing certificates (e.g. UNESCO)

These actors and stakeholders should be involved in participatory processes (also see Chapter 6.6. '*HFR Principle No. 6: Participation of civil society*') in order to legitimate the *HFR* engagement, tailor it in accordance to their needs and expectations, support shared responsibility and identification as well as build on their knowledge and experience.

4.3. Supporting regional exchange

To successfully establish a well-functioning regional *Healthy Forest Regions* network, the following principles and practical considerations should be taken into account:

Strategic orientation and governance

- Define clear, realistic, and shared objectives.
- Assign a coordinating person or institution to ensure continuity and facilitate processes.
- Maintain clear communication channels (e.g., mailing lists, shared digital workspaces).

Integration and stakeholder engagement

- Build on existing networks instead of creating parallel structures.
- Connect all relevant forest-related stakeholders across sectors.
- Incorporate stakeholders' priorities to ensure relevance and long-term engagement.

Participation and social cohesion

- Foster a sense of shared responsibility and regional identity.
- Take contributions seriously and integrate them visibly into processes.
- Use participatory workshops, meetings, and field visits to strengthen trust and collaboration.

Formats for exchange

- Prioritise in-person meetings and rotate events across the region.
- Link discussions to current data (e.g., forest health monitoring) for evidence-based dialogue.

- Provide regular opportunities for exchanging experiences and ideas.

Visibility and incentives

- Highlight tangible benefits of participation, such as access to funding, improved guidance, and regional visibility.
- Support local initiatives to strengthen identification with the region.

Practical feasibility

- Design meetings and workshops to be efficient, well-facilitated, and outcome-oriented, taking into account stakeholders' time constraints.

5. Binding Criteria for becoming an *HFR*

For a region to qualify as a *Healthy Forest Region*, it must meet the following criteria. These criteria are designed to remain accessible while establishing clear minimum standards considering the different conditions across the areas where they are desired to be applied. They avoid setting unnecessarily high barriers, enabling broad participation of diverse regions throughout Europe and possibly beyond, while still defining a common baseline of quality. Making the criteria binding ensures clarity and credibility: they help delineate the region, provide orientation for implementation, and prevent arbitrary application of the concept.

5.1. *HFR Criterion No. 1*: Defined border

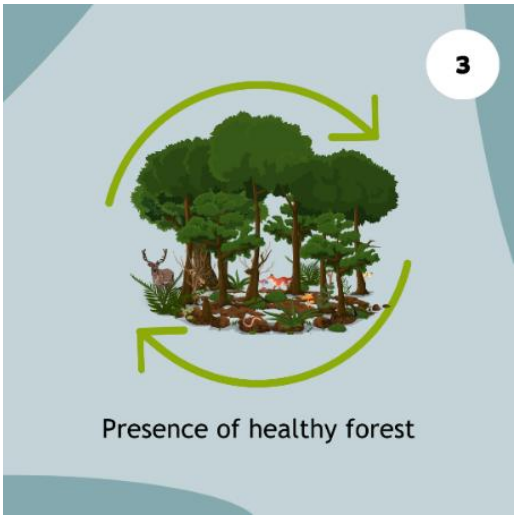
The minimum size of the *HFR* should be defined based on the minimum required forest cover, ensuring that it forms one continuous area without cut-outs. Its borders should be clear, unambiguous and understandable and meet the requirements of the other *HFR Binding Criteria*. They should ideally be aligned with ecological and/or terrain patterns. At the same time, it might be helpful to consider predefined boundaries such as administrative boundaries, forest management units, or protected areas to ease management and communication. The same applies to the areas of influence and responsibility of key regional actors and to land ownership. In addition to reflecting the current status quo, the *HFR* could also take future development potential into account, allowing for long-term planning and appropriate regional development.

5.2. *HFR Criterion No. 2*: Forest cover

The most important asset of a HFR is its forest. Therefore, the minimum forest cover in an HFR should be 50% of the area with at least 4000 ha of forest area. In this case, forest would be any area of woody vegetation with a minimum height of 5 meters and 30% canopy closure.

5.3. *HFR Criterion No. 3*: Healthy forest

Not forest alone is an important asset of a *HFR* but, more specifically, also forest that is considered more or less healthy is a key element and must therefore be present in an *HFR*.



The *HFR* definition of a healthy forest becomes more tangible through more concrete considerations.

To judge whether a forest fulfils the requirements of a healthy forest, several more concrete aspects can be considered and evaluated.

Forest structure is central as the forest should comprise of a diversity of forest stand structures (i.e., trees of different ages and sizes coexist) also creating varied habitats from canopy to understory and including features such as deadwood and habitat trees. Such forest should also host a wide range of animal and plant species, including key organisms that maintain ecological balance enhancing and/or maintaining biodiversity.

Healthy soils and water systems are another pillar. The soil should be rich in organic matter, with low erosion and good nutrient cycling, while streams and wetlands should flow regularly and maintain high water quality, considering typical soil type of the area. Forest productivity should be strong but as balanced as possible for the site-typical forest type: trees grow and regenerate at a natural pace that can replace losses without the necessity to invest in artificial regeneration (i.e., planting).

A healthy forest also shows resilience to natural disturbances. It can withstand pests, diseases, fires, or storms without collapsing, and it recovers in a timeframe typical for its region. In addition, such forests play a vital role in climate regulation by storing carbon and buffering temperature and humidity.

Human influences must remain within sustainable limits. Logging, tourism, and land-use changes should not undermine ecological functions, and communities should be engaged in the stewardship of their *Healthy Forest Regions*, if possible, as it is the environment they live in, and which provides livelihood for them. Finally, forests must also provide space for recreation, leisure, for observation of nature, for picking forest fruits, place for learning, culture, resource of timber materials, food and source of income as well as

environmental service provider that all contribute to human well-being also ensuring the balance between productional, ecological and social functions of forest.

The following **indicators** can be checked when evaluating the health of a forest:

1. Biodiversity
▪ Species richness and abundance (flora and fauna) ▪ Presence of keystone or indicator species / communities ▪ Habitat diversity (canopy layers, deadwood, understory
2. Forest Structure
▪ Tree age and size diversity ▪ Canopy cover and stratification ▪ Regeneration rates (natural or planted)
3. Soil and water health
▪ Soil organic matter and nutrient levels ▪ Erosion indicators ▪ Stream flow regularity and water quality
4. Productivity and growth
▪ Net primary productivity ▪ Tree growth rates ▪ Forest regeneration success
5. Disturbance and resilience
▪ Pest/disease levels ▪ Fire regimes (natural vs. human-caused) ▪ Invasive species presence ▪ Recovery from disturbances
6. Carbon and climate regulation
▪ Above- and below-ground biomass ▪ Carbon sequestration rates ▪ Temperature and moisture regulation capacity
7. Human impact and management
▪ Logging pressure ▪ Illegal activity ▪ Land-use change ▪ Community involvement in forest stewardship ▪ FSC or PEFC Certificate Schemes
8. Human well-being
▪ Recreation possibilities ▪ Tourist infrastructure

- Free access to forest

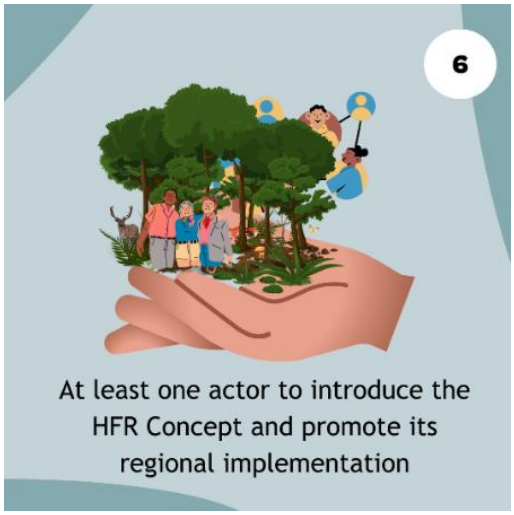
5.4. *HFR Criterion No. 4*: Protected forest area

Forests within an *HFR* should be protected to a minimum extent in order to demonstrate and maintain the region's exceptional condition. First, an *HFR* must either include a UNESCO World Heritage Beech Forest site or comprise at least 5% of other officially designated, strictly protected non-intervention forest areas with adequate buffer zones. Such strictly protected forests not only conserve highly valuable forest ecosystems but also serve as important reference and learning sites. Second, within the *HFR*, at least 50% of all protected areas should consist of forest land. In this context, emphasis should be placed on officially designated conservation areas rather than management-based instruments (such as certification schemes or specific forest management approaches), as only the former ensure a sufficiently high and lasting level of protection.

5.5. *HFR Criterion No. 5*: Integration of people

Although an *HFR* consists mainly of forest, another important component is the people who live in, with and/or from this forest. Therefore, in an *HFR* settlements and even small towns must be included with a certain degree of social processes. There should be educational institutions present in the area – this means at least public primary and secondary schools. Additionally, also institutions that provide different forms of education like protected areas administration or forest administrations would be beneficial. Another important prerequisite is a minimum public access to forest and its diverse ecosystem services.

5.6. *HFR Criterion No. 6*: Engaged actor



To introduce the *HFR Concept* in a region, at least one committed regional actor is required to assume a coordinating role. This actor initiates and facilitates communication and implementation processes, mobilises additional actors and stakeholders, and fosters their commitment to the *HFR Action Principles*.

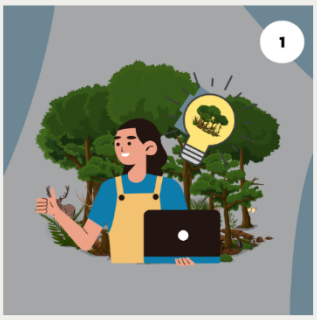
6. *Guiding Action Principles* for implementing the *HFR* idea

When a forest-rich region decides to embark on the path of a *Healthy Forest Region*, it commits to a set of guiding action principles. These principles translate the conceptual idea of *HFR*s into practice and provide orientation on what to strive for and how to advance the overarching goal: safeguarding and enhancing healthy forest ecosystems to secure human well-being.

The *HFR* approach does not require strict implementation of all principles from the outset. However, to achieve the most meaningful and sustainable impact, it is advisable to gradually address all principles and build a cross-sectoral network of actors, combining their expertise and efforts. Viewing the *HFR* as an integrated system helps identify the most effective levers for safeguarding regional forest ecosystems. Just as the challenges we face are complex and multilayered, the solutions must be equally comprehensive. Individual engagement is an important first step but quickly reaches its limits when addressing structural and systemic issues.

The *HFR Principles* encourage regions to move in a certain direction and progressively align with the envisioned standards. Embarking on the path of an *HFR* is an iterative process of experimenting, learning, adjusting, and jointly evolving. It represents a self-binding commitment to a particular trajectory of regional development, grounded in the conviction that strengthening forest health is a reliable foundation for long-term regional resilience and prosperity.

6.1. *HFR Principle No. 1*: Forest management



HFR Principle No. 1: An HFR commits to implement an ecosystem-based, close-to-nature forest management and ecosystem-specific biodiversity conservation on a regional level in order to maintain and/or increase forest health, maintain and/or increase healthy forest area as well as maintain and/or increase forest cover.

The type of forest management plays a crucial role in the functionality, resilience and health of regional forests. In *Healthy Forest Regions*, forest management is guided by an ecosystem-based and close-to-nature approach, applied at both the forest stand and the wider landscape level. This approach focuses on safeguarding essential forest structures, functions and ecosystem services, strengthening ecological resilience and ensuring that forests continue to provide multiple benefits to society under changing climatic and socio-economic conditions.

The *HFR General Forest Health Strategy*, developed in the *HFR Project* (see Chapter 7.3), addresses two complementary objectives:

- Promote and implement ecosystem-based and multipurpose forest management
- Promote landscape development that aims to support forest health

In many forest regions, ecosystem-based and close-to-nature forest management is already well established and rooted in long-standing professional practice and tradition. *Healthy Forest Regions* explicitly recognise, value and build upon these existing management systems, experiences and knowledge bases. The *HFR Concept* does not replace such approaches; rather, it provides a common strategic framework to further strengthen, connect and communicate them at regional and supra-regional level. It supports increasing the share of healthy forest, enhancing ecosystem services and—when the landscape dimension is sufficiently considered—preserving or even expanding forest cover.

As with the implementation of the *HFR Action Principles* in general, the introduction or further development of ecosystem-based forest management should follow a stepwise and context-sensitive approach. In regions where close-to-nature forestry is already the standard, the focus may lie on consolidation, refinement and upscaling at the landscape level. In regions where such approaches are less established, gradual introduction and learning processes are advisable.

The *HFR General Forest Health Strategy* provides guidance for these different starting points. It outlines initial steps, identifies typical barriers and proposes strategic pathways to overcome them. Closely linked to the general strategy, *regional forest health strategies* (see Chapter 7.3) developed through participatory processes translate overarching approaches into region-specific solutions. These regional strategies demonstrate how ecosystem-based forest management can be embedded in local contexts and can serve as inspiration for designing and implementing tailored strategy processes in other forest regions.

Ecosystem-based, close-to-nature forest management is not only a silvicultural commitment, but a governance principle. In *Healthy Forest Regions* this principle is embedded in coordinated institutional frameworks, supported by cross-sectoral cooperation and enabled by multi-level governance structures that jointly safeguard forest health and ecosystem functionality over the long term.

6.2. *HFR Principle No. 2*: Forest ecosystem services

HFR Principle No. 2: An HFR commits to acknowledge the value of the full range of forest ecosystem services for human well-being, and their potential to create secondary benefits.

Forests across Europe provide a wide range of essential ecosystem services that support environmental stability and human well-being. General ecosystem services concept developed by *Millenium Ecosystem Assessment (MEA)* and *Common International Classification of Ecosystem Services (CICES*), define the ecosystem services as contributors that ecosystems make to human well-being. For example, these services include carbon sequestration, biodiversity conservation, water regulation, soil protection, and recreational and cultural benefits. The concept of forest related ecosystem services relies on several principles, such as:

- Forest ecosystem services should be assessed with indicators and valuation methods that capture both biophysical supply and human values.
- Forest ecosystem services are simultaneously social (defined by human needs and values) and ecological (produced by ecological structure, functions and biodiversity).
- Forests must be analysed and managed as multifunctional systems, explicitly considering trade-offs and synergies among services.
- Assessment and management of forest ecosystem services must account for spatial and temporal scales, landscape context and change over time.
- Long-term provision of forest ecosystem services requires maintaining resilient, biodiverse and ecologically functioning forest ecosystems.

In the context of the *HFR Action Principles*, ecosystem-based, close-to-nature and closer-to-nature forest management approaches enhance the provision of forest ecosystem services. As an alternative income option for forest owners and managers beyond timber, Payments for Ecosystem Services (PES) schemes have emerged as innovative tools to align environmental conservation with socio-economic development, rewarding land managers for maintaining and enhancing the ecological functions on which society depends.

When implementing *HFR Action Principles* for valuing ecosystem services, strong stakeholder engagement and a transparent process must be established (see Chapter 7.2). Discussion and communication platforms for resolving conflicts and seeking solutions are valuable options. Establishing clarity about national and international rules and legislation, as well as activities in forest management plans, will provide greater opportunities for engaging in payment schemes.

6.3. *HFR Principle No. 3:* Research & monitoring

HFR Principle No. 3: An HFR supports, organizes and/or conducts research and monitoring of the health and ecosystem services of the regional forests.

Robust research and continuous monitoring form the backbone of informed decision-making in *Healthy Forest Regions*. They provide the knowledge base needed to understand the current condition of regional forests, identify trends and risks, assess the effectiveness of implemented measures and reveal ecological as well as socio-economic potential. Research and monitoring are therefore essential for steering forest-rich regions through ongoing social-ecological change and climate change impacts.

Healthy Forest Regions build on existing, well-established forest monitoring systems and long-term data series, which are already in place in several regions through forest administrations, protected area authorities, research institutions and national monitoring programmes. These systems provide indispensable baseline information on forest structure, vitality, biodiversity, disturbances and ecosystem functions. The *HFR Concept* explicitly recognises and values this ongoing work and seeks to connect, strengthen and make better use of existing monitoring capacities, rather than duplicating them.

At the same time, *Healthy Forest Regions* promote the integration of innovative, science-based methods and tools to complement established monitoring approaches. As a lighthouse innovation, the *Healthy Forest App* (see Chapter 7.3) was developed within the *HFR Project* to provide remote, data-driven insights into forest vitality. This tool demonstrates how recent technologies such as remote sensing and digital data integration can enhance spatial coverage, comparability and accessibility of forest health information, supporting adaptive management and transparent communication.

To strengthen evidence-based regional development, *Healthy Forest Regions* are encouraged to:

- involve research organisations and scientific institutions in projects and strategies linked to the *HFR* vision;
- systematically use and further develop existing forest monitoring systems, long-term datasets and indicators as a foundation for regional decision-making;
- complement established monitoring with open-source tools and innovative methods, such as remote sensing applications, ecological databases and forest health assessment frameworks;
- collaborate closely with regional actors already applying science-based tools, ensuring that data, expertise and results are shared across sectors and institutional boundaries.

By embedding research and monitoring into everyday regional practice, *Healthy Forest Regions* create a reliable foundation for strategic planning, learning and adaptation. This enables transparent communication with stakeholders and the public, supports informed political decisions and strengthens the long-term resilience and vitality of forest ecosystems.

6.4. *HFR Principle No. 4*: Educational work

HFR Principle No. 4: An HFR integrates the education of different groups of stakeholders about forest ecosystems and their services.

A *Healthy Forest Region* is built on knowledge and understanding, strengthened by conviction, a close connection to nature, political will and commitment, and a shared sense of responsibility. Integrating education about forest ecosystems and their services across all stakeholder groups is therefore a core *HFR Action Principle*. Educational work in an *HFR* is understood as a structured, long-term and practice-oriented process that builds ecological literacy and makes the links between forest health and human well-being visible, tangible and regionally relevant (see Chapter 7.1).

Forests are not only landscapes of natural beauty; they are living systems that sustain human health and well-being. They regulate climate, protect water resources, support biodiversity, provide food and raw materials, and offer spaces for recreation, learning and mental health. When forests are healthy, they strengthen the resilience of communities and regions. Education plays a key role in conveying this understanding by translating scientific knowledge into concrete experiences, locally adapted narratives and everyday learning contexts.

Climate change affects each forest region differently — through drought, storms, wildfires or changing species composition. Educational initiatives should therefore explain how climate change is already impacting local forests and what this means for water availability, food security, public health and regional economies. At the same time, they should highlight how forests contribute to mitigation and adaptation, for example through carbon storage, cooling effects, flood protection and climate-resilient forest management. Using regional examples and locally developed educational materials helps make these abstract challenges understandable and actionable.

Education must reach children and young people as one crucial target group. Integrating forest-related education into schools, vocational training, public communication and community initiatives ensures that the idea of *Healthy Forest Regions* becomes part of everyday practice. Education builds on educational packages and learning formats that combine classroom-based preparation with experiential, outdoor learning in real forest environments and that are aligned with school curricula and regional conditions. By linking theory with direct experience, educational initiatives enable learners to understand forest ecosystems as functional systems that directly influence their own quality of life.

Equally important is empowering decision-makers as well as local communities. Policymakers, planners and land managers need not only scientific knowledge but also strong conviction and a meaningful connection to nature in order to make informed, long-term decisions that ensure forests continue to provide essential ecosystem services.

Visitor-oriented work, using tools such as the *HFR Interpretation Plan* and concepts and guidelines of best practice in implementing forest-related tourist packages, nature therapy or recreation offers, as well as the installation of forest guards, creates regional benefits for local and regional actors while raising awareness of the value of healthy forest ecosystems for human well-being.

Informed people are more likely to act responsibly, support sustainable policies and make daily choices that protect forests. Education therefore lays the foundation for collective action and long-term stewardship, ensuring that healthy forests remain a cornerstone of resilient, liveable and thriving regions.

6.5. *HFR* Principle No. 5: Infrastructure development

HFR Principle No. 5: An HFR considers regionality, social-ecological transition, forest health and human well-being in the development and adaptation of human infrastructure.

Human infrastructure is essential for ensuring a high quality of life — yet it is also one of the strongest drivers of ecosystem degradation. Roads, settlements, energy installations, and other infrastructural elements reshape landscapes, fragment habitats, and undermine the functionality of forest ecosystems. In many cases, forests are cleared or sealed to create space for infrastructure with a single, short-term purpose, while the long-term, multipurpose value of healthy forests — such as climate regulation, water retention, biodiversity, recreation, and cultural meaning — remains undervalued.

This guiding principle encourages *HFR*s to rethink and redesign infrastructure planning so that functional forest ecosystems are treated as a fundamental pillar of human well-being, not an optional add-on. This means giving clear priority to solutions that preserve forest health and ecosystem services and avoiding infrastructure choices that cause unnecessary forest loss or fragmentation. Where infrastructure is needed, it should be developed in ways that respect regional characteristics, support the social-ecological transition, and contribute to long-term resilience. In practice, this principle implies that:

- Infrastructure decisions are based on inclusive, informed, multi-stakeholder processes that take into account regional needs, limitations, development goals, and the commitments associated with being a Healthy Forest Region.
- New soil sealing and deforestation are strictly avoided. Where impacts cannot be fully prevented, infrastructure must be designed to minimise forest loss, fragmentation, and ecological disturbance.
- Existing infrastructure should be adapted and redesigned to reduce sealing, support natural regeneration, and strengthen the forest's and landscape's self-regulating capacity—ultimately enhancing human well-being and regional resilience.

By aligning infrastructure development with forest health and regional priorities, *HFRs* create environments where people and forests can thrive together, ensuring that growth and resilience go hand in hand.

6.6. *HFR* Principle No. 6: Participation of civil society

HFR Principle No. 6: An HFR provides diverse opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, supporting the idea of an HFR.

Participation is essential to ensure societal legitimacy. Decisions on forest management, ecosystem services or regional development directly affect many stakeholders. Therefore, those affected should be involved in shaping such decisions. Inclusive participation makes decision-making processes more transparent, comprehensible and widely accepted. When goals are developed jointly and decisions are taken through participatory processes, a sense of shared responsibility emerges, increasing the willingness of all actors to take ownership of implementation and to contribute actively to achieving commonly agreed objectives.

In an *HFR*, it is essential to integrate regional knowledge and experience from professional practice, scientific research, voluntary engagement and everyday life. This ensures that engagement is aligned with regional realities as well as multi-stakeholder needs and expectations. At the same time, participation is also an expression of appreciation and respect. It signals that the perspectives, experiences and local knowledge of those involved are valued and taken seriously. This recognition strengthens trust between institutions, experts and the public and creates a constructive basis for long-term cooperation.

In addition, participation fosters social cohesion and regional identity. By engaging people in dialogue and joint activities related to forests, the forest becomes more strongly anchored as a shared asset and point of identification within the region. This emotional and cultural connection is a key prerequisite for sustainable, forest-friendly development and long-term stewardship of healthy forest ecosystems.

To implement this principle, a *Healthy Forest Region* should offer a broad range of inclusive and target-group-oriented participation formats, such as:

- public and expert surveys
- citizen dialogues and participatory forums
- public and expert forest excursions
- regular consultation hours with regional foresters
- film screenings and cultural events focusing on forests and ecosystem services
- workshop formats for citizens and professionals
- interdisciplinary and cross-sector networking formats
- fairs, conferences and regional professional events

A *Healthy Forest Region* understands participation not as a one-off activity, but as an ongoing process. By creating spaces for dialogue, co-creation and mutual learning, it lays the foundation for robust decisions, shared responsibility and a collectively supported future for healthy forests.

6.7. HFR Principle No. 7: Cooperation & network

HFR Principle No. 7: An HFR shall seek for international cooperation and exchange with other HFRs in a network.

In addition to networking and cooperation within one region (see Chapter 4), it can be of great value to also connect with other *Healthy Forest Regions*. Particular emphasis should be placed on networking with other forest regions within the same country, as the shared cultural, historical, linguistic, climatic and, in some cases, landscape context can significantly enhance the possibilities and depth of knowledge exchange and foster synergies. These include, for example, coordinated strategic approaches, the exchange of materials such as educational resources, and the use of existing networks and structures. From an international perspective, networking offers the opportunity to learn from one another, particularly with regard to the diverse administrative and institutional frameworks of regional forest health.

At the time the *HFR Concept* was developed, the partner consortium of the *HFR Project* constituted the existing international *HFR* network. Although no direct follow-up proposal was submitted, applying for EU funding to further develop the idea and international cooperation in a subsequent project is considered particularly promising. In the absence of new funding and the resulting continued expansion of the *HFR* network, it is recommended to draw on existing structures for professional exchange and cooperation, such as the network of *UNESCO World Heritage Beech Forests*.

7. HFR lighthouse projects

The following chapter demonstrates how the *HFR* idea and concept can be implemented in practice by addressing the three different **fields of action** in a *Healthy Forest Region*: (a) education and secondary benefits, (b) ecosystem services and alternative income sources, and (c) forest health and regional planning. The chapter briefly describes each field of action, shows the *HFR Principles* it addresses, and presents lighthouse projects that can serve as orientation and inspiration for practical action.

7.1. Lighthouse projects - Education & secondary benefits

Promotion of forest ecosystem-based sustainable regional development for human well-being in *HFR*.

Forests provide essential ecosystem services — such as climate regulation, clean water, recreation, health benefits, and cultural value — that form the foundation for human well-being and regional resilience. These services often remain invisible or underappreciated, limiting their potential to support sustainable development. In the field of “Education and secondary benefits”, forest ecosystem services shall be made tangible and accessible for local residents and visitors.

***HFR* Principles that are targeted by the lighthouse projects in the field of education and secondary benefits:**

HFR Principle No. 2: An HFR commits to acknowledge the value of the full range of forest ecosystem services for human well-being, and their potential to create secondary benefits.

HFR Principle No. 4: An HFR integrates the education of different groups of stakeholders about forest ecosystems and their services.

HFR Principle No. 5: An HFR considers regionality, social-ecological transition, forest health and human well-being in the development and adaptation of human infrastructure.

HFR Principle No. 6: An HFR provides diverse opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, supporting the idea of an HFR.

HFR Principle No. 7: An HFR shall seek for international cooperation and exchange with other HFRs in a network.

Lighthouse 1.1: Nature Interpretation as a tool for raising awareness and communicating the *HFR Concept*

One of the cornerstone activities of the *HealthyForestRegions Project* was the development of a joint nature interpretation strategy for *Healthy Forest Regions*. This approach recognizes the power of storytelling, experiential learning and place-based education to build a deeper understanding of forests and their importance for human health and well-being. This interpretation strategy served as a common baseline for the implementation of several pilot actions which promote the idea of *Healthy Forest Regions* in our target regions. It further includes interpretive themes that highlight the multifunctionality of forests – as ecosystems, climate buffers, recreational spaces and economic assets – and presents a variety of helpful nature interpretation tools. The development of the strategy involved people with different backgrounds (municipalities, administrations of protected areas, forestry authorities, NGOs, universities etc.) and expertise (forestry, education, nature protection etc.).

Interpretive guiding course in Jizera Mts., July 2024

In the context of the strategy development, local educational actors – such as guides, teachers, rangers and nature educators – participated in an intensive nature interpretation training course in our target regions. In these trainings, the principles and techniques of professional nature interpretation were intensively studied and tested in practice. These trainings empowered local educators to effectively engage diverse audiences by using interactive methods that spark curiosity and foster a sense of stewardship towards the protection of forests.

By embedding nature interpretation into educational activities, communication and outreach efforts in the form of an interpretation strategy, nature interpretation can become a powerful and transformative tool for sustainable regional development, climate awareness and participatory environmental protection.

Relevant *HFR* products:

Healthy Forest Regions Interpretation Plan (available at: https://www.interreg-central.eu/wp-content/uploads/2025/08/Interpretation_Plan_for_HFR.pdf, accessed on 19 February 2026)

Lighthouse 1.2: Forest Classrooms and school-based environmental programs

Education lies at the heart of the *Healthy Forest Regions Concept*. A dedicated effort has been made to bring environmental learning directly into the forest, turning nature into a living classroom. This initiative focused on two main pillars: the development of educational packages for schools and the installation of forest classrooms.

The educational packages are aligned with school curricula and developed in cooperation with educators and forest experts. These resources include hands-on materials, lesson plans and field activity guides that help teachers incorporate forest-related topics into school subjects. The aim is to foster ecological literacy from an early age and to strengthen students' emotional and cognitive connection to the forest environment.

Forest classrooms have been established in selected forest areas. These open-air learning spaces were equipped with a basic infrastructure (seating, shelters etc.) and educational materials (interpretive installations, information boards etc.) that enable group learning experiences directly in nature. Teachers and environmental educators use these classrooms for school teaching, excursions, science projects, workshops and seasonal learning events.

This approach to environmental education – the development of educational programs and the installation of forest classrooms – allows children and young people to experience the forest with all their senses, helping them to understand ecological interconnections, the importance of biodiversity and the role forests play in climate protection and for human well-being. By integrating forest education into everyday school life and creating accessible infrastructure for outdoor learning, it demonstrates how new measures can be successfully integrated into existing structures – transforming them towards the formation of environmentally responsible.

Relevant *HFR* products:

Good Practice Guide: How to integrate forest ecosystems and their services for human well-being into education (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Good-Practice-Guide-Education-on-Forest-Ecosystems-and-their-Services.pdf, *accessed on 8 April 2026)*

Lighthouse 1.3: Community and visitor engagement through *HFR*-inspired nature experiences

Healthy Forest Regions thrive through active community participation and meaningful visitor experiences. The *HFR Project* has embraced this principle by developing a range of interpretation-based activities and nature therapy offerings aimed at both residents and tourists. These initiatives not only promote the region's natural assets but also directly contribute to public health and local value creation.

One of the flagship formats was the introduction of nature therapy tourism packages, including different offers such as forest bathing (Shinrin Yoku), forest detox experiences, drawing - art in the wild - and mountain biking. These experiences are designed to support mental well-being, reduce stress, and reconnect people with nature.

To engage families and individual explorers, interactive forest rallies have been developed. These self-guided adventures take visitors along a defined trail where they encounter themed stations highlighting forest ecology, wildlife, forest management, forest ecosystem services and the cultural significance of the region's woodlands. The rallies use interpretive signage and partially digital media to create a playful and educational experience for all ages.

These community- and visitor-oriented activities demonstrated how the *HFR Concept* can generate ecological, social, and economic benefits. By combining environmental education with health promotion and sustainable tourism, *Healthy Forest Regions* are building a resilient and inclusive model for rural development grounded in nature connection and long-term sustainability.

Relevant *HFR* products:

Good Practice Guide: How to create secondary benefits for local stakeholders in Healthy Forest Regions (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Good-Practice-Guide-Secondary-Benefits-in-HFRs.pdf, *accessed on 8 April 2026)*

7.2. Lighthouse projects - Ecosystem services & alternative income

Reimbursement systems for forest ecosystem services - exploring and implementing new opportunities.

Many important forest ecosystem services — such as hazard protection, carbon storage, and temperature regulation — are not fully rewarded by conventional markets. The action field "Ecosystem services & alternative income" addresses the need to create financial incentives that recognize and reinforce these services by encouraging to explore and pilot payment schemes for forest ecosystem services

***HFR Principles* related to the lighthouse projects in the field of ecosystem services and alternative income sources:**

HFR Principle No. 2: An HFR commits to acknowledge the value of the full range of forest ecosystem services for human well-being, and their potential to create secondary benefits.

HFR Principle No. 5: An HFR considers regionality, social-ecological transition, forest health and human well-being in the development and adaptation of human infrastructure.

HFR Principle No. 6: An HFR provides diverse opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, supporting the idea of an HFR.

HFR Principle No. 7: An HFR shall seek for international cooperation and exchange with other HFRs in a network.

Lighthouse 2.1: Regional forest action plans for ecosystem services

The *Regional Forest Action Plans for Ecosystem Services* is a key initiative of the *Healthy Forest Regions Project*. It builds on prior assessments and focuses on creating practical, participatory action plans in three pilot regions: Austria, Slovenia, and Slovakia. These plans aim to secure and strengthen the provision of forest-based ecosystem services (ES), including biodiversity, carbon storage, natural hazards, and tourism and recreation.

The main goal of this lighthouse project is to co-develop action plans that are harmonized with the current regional policies and adaptable to both current and future demands. Each plan will be assessed in terms of feasibility and compared to existing management approaches, highlighting potential improvements in ES delivery. By addressing expected challenges such as climate change, shifting social priorities, and regional development pressures, the project ensures that forest management strategies remain resilient and forward-looking.

A participative process is central to the project. Forest owners, local authorities, policy-makers, and other stakeholders are directly engaged through regional workshops, expert groups, and information events. One workshop in each target region will serve as the main platform for developing these joint action plans. Communication will be broad and transparent, using media outlets, project websites, and social channels to reach both local communities and wider audiences.

Target groups include forest managers, decision-makers, regional authorities, NGOs, and citizens. For *HFRs*, this project is a bridge from research to action, ensuring scientific results are transformed into strategies that foster healthier, multifunctional, and sustainable forest landscapes.

Relevant *HFR* products:

Regional Strategy for Prioritisation of Forest Ecosystem Services in Austria (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-AT.pdf, *accessed on 8 April 2026)*

Regional Strategy for Prioritisation of Forest Ecosystem Services in Slovenia (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-SI.pdf, *accessed on 8 April 2026)*

Regional Strategy for Prioritisation of Forest Ecosystem Services in Slovakia (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-SK.pdf, *accessed on 8 April 2026)*

Lighthouse 2.2: Forests for the future - Creating market engagement for ecosystem services

This lighthouse project focuses on turning the diverse values of forests into concrete opportunities by establishing and testing payment schemes for ecosystem services (PES) in three pilot areas: Austria, Slovenia, and Slovakia. Building on the portfolio of ecosystem services identified and the strategies prioritized in earlier phases of *HFR*, the project explores how forests can generate additional benefits through new markets, ranging from biodiversity conservation and carbon sequestration to recreation, tourism, and natural hazard protection.

The ambition is to design innovative PES models that are not only relevant for local contexts but also transferable to other European regions. In Austria, the initiative brings together stakeholders such as the *Styrian Eisenwurzen Nature Park*, the *Federal Research Centre for Forests*, public forest enterprises, and the wood industry. In Slovenia, state and municipal forest owners, as well as the *Slovenian Forest Service* and associated partners, are central actors. Slovakia focuses on engaging all associated partners in shaping new PES schemes, particularly in relation to biodiversity and carbon markets.

What makes this project particularly valuable, is its transnational character. The three regions do not work in isolation but exchange expertise, compare approaches, and jointly develop marketing strategies. Best-practice examples from other European contexts are examined and integrated, ensuring that lessons learned extend beyond the pilot areas.

The target audience includes forest owners and managers, wood-processing companies, tourism operators, environmental NGOs, and public authorities. Results will be disseminated broadly via press releases, project websites, and social media, while practical information flyers on implemented schemes will support direct outreach to landowners.

For an *HFR*, this lighthouse project represents the move from strategy to practice. By linking ecosystem services with economic instruments, it demonstrates how close-to nature management can be financially viable, securing healthier forest regions for future generations.

Relevant *HFR* products:

Regional Strategy for Prioritisation of Forest Ecosystem Services in Austria (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-AT.pdf, *accessed on 8 April 2026)*

Regional Strategy for Prioritisation of Forest Ecosystem Services in Slovenia (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-SI.pdf, *accessed on 8 April 2026)*

Regional Strategy for Prioritisation of Forest Ecosystem Services in Slovakia (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Priorisation-of-Ecosystem-Services-in-SK.pdf, *accessed on 8 April 2026)*

Lighthouse 2.3: Green value chains – Unlocking markets for ecosystem services

The Green Value Chains lighthouse project focuses on creating and testing new market opportunities for forest-based ecosystem services (ES) in Austria, Slovenia, and Slovakia. Building on the prioritization of strategies and action plans from earlier *HFR* work, the lighthouse aims to transform forests' ecological functions — such as biodiversity conservation, carbon sequestration, natural hazard protection, recreation, and tourism — into tangible economic benefits through innovative payment for ecosystem services (PES) schemes. By linking ecological value to market mechanisms, the project supports sustainable and multifunctional forest management.

The lighthouse's main goal is to develop regionally adapted PES schemes and assess their potential compared to existing practices. A key feature is the transnational exchange of expertise. The three regions collaborate

on shared approaches, joint marketing strategies, and integration of best practices from other European regions. This ensures that solutions are not only effective locally but also transferable and scalable across Central Europe.

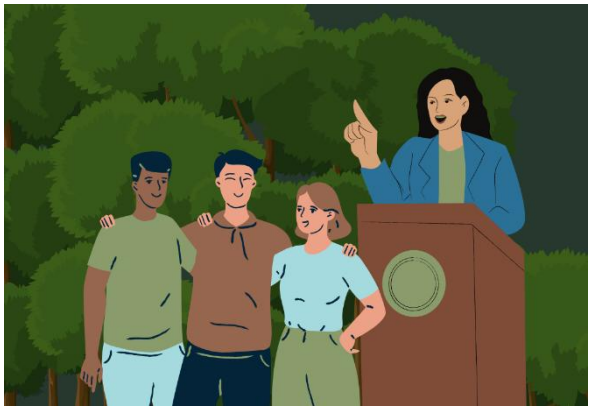
Target groups include forest owners, managers, wood-processing companies, local communities, tourism operators, NGOs, and public authorities.

For *Healthy Forest Regions*, this lighthouse project is a critical step from planning to practical application. By creating economic incentives for ecosystem services, it strengthens forest resilience, supports sustainable management, and provides ecological, social, and economic benefits across the three pilot regions.

Relevant *HFR* products:

Best Practice Guide for the Operationalisation of Payment Schemes for Ecosystem Services (PES) in Forests (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Best-Practice-Guide-Operationalisation-Payment-Schemes-for-Ecosystem-Services.pdf , *accessed on 8 April 2026)*

7.3. Lighthouse projects - Forest health & regional planning



Developing operational frameworks for safeguarding forest ecosystem functionality in *HFR*

The field "Forest health & regional planning" focuses on identifying and understanding the socio-ecological and institutional framework conditions that support or hinder forest health in a region. It emphasizes developing practical frameworks and strategies that enable and encourage policy- and decision-makers to preserve and enhance forest functionality, thereby safeguarding the ecosystem services that underpin regional human well-being.

***HFR Principles* related to the lighthouse projects in the field of forest health analysis and regional planning:**

HFR Principle No. 1: An HFR commits to implement an ecosystem-based, close-to-nature forest management and ecosystem-specific biodiversity conservation on a regional level in order to maintain and/or increase forest health, maintain and/or increase healthy forest area as well as maintain and/or increase forest cover.

HFR Principle No. 3: An HFR supports, organizes and/or conducts research and monitoring of the health and ecosystem services of the regional forests.

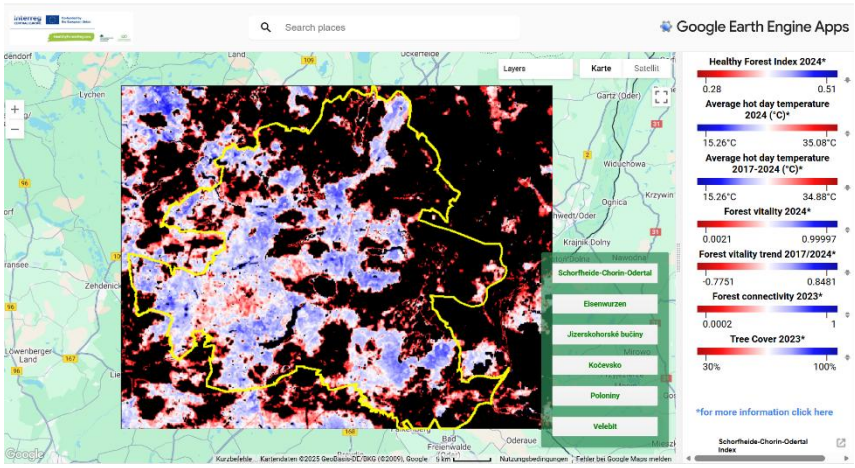
HFR Principle No. 5: An HFR considers regionality, social-ecological transition, forest health and human well-being in the development and adaptation of human infrastructure.

HFR Principle No. 6: An HFR provides diverse opportunities for civil society and other relevant actors to participate in the decision-making and implementation process, supporting the idea of an HFR.

HFR Principle No. 7: An HFR shall seek for international cooperation and exchange with other HFRs in a network.

Lighthouse 3.1: The *Healthy Forest App*: Mapping forest health across Europe

The *Healthy Forest App* is a flagship innovation of the *Interreg Central Europe* project *Healthy Forest Regions*. Developed by the *Centre for Econics and Ecosystem Management* at *Eberswalde University for Sustainable Development*, the app provides a cutting-edge, web-based tool for assessing the health and ecological functionality of forest ecosystems using satellite imagery processed through *Google Earth Engine*.



Screenshot Healthy Forest App: Project region Schorfheide-Chorin-Odertal

The primary goal of the *Healthy Forest App* is to support understanding of forest health in selected forest regions and identifying critical areas for intervention. Because forest health cannot be directly measured, the app translates satellite-derived data — such as Land Surface Temperature (LST), NDVI, and global forest extent datasets — into five scientifically grounded proxies: Hot Day Temperature (2024), Hot Day Temperature Change (2017–2024), Forest Vitality (2024), Forest Vitality Change (2017–2024), and Forest Connectivity (2023). These proxies are analysed for every pixel classified as forest within the region. To provide an easily accessible overview, three core proxies are integrated into a single, standardised Healthy Forest Index using Z-score normalisation, enabling comparable assessments across regions.

The app offers several key benefits. It consolidates previously scattered data into one intuitive platform, enabling both scientific and practical users to view complex forest health indicators on a satellite map. Its standardised and accessible methodology allows forest managers, conservation authorities, and regional stakeholders to compare results across international pilot regions. By providing advanced, data-driven insights, the app forms an essential basis for defining what constitutes a Healthy Forest Region and for designing targeted measures to improve forest resilience and ecosystem functionality.

Currently, the *Healthy Forest App* covers six *HFR* regions across Central Europe: Eisenwurzen (AT), Schorfheide-Chorin-Unteres Odertal (DE), Jizerskohorské Bučiny (CZ), Poloniny (SK), Kočevsko (SI), and Velebit (HR).

Relevant *HFR* products:

Healthy Forest App (available at: https://econics.projects.earthengine.app/view/healthyforest, accessed on 19 February 2026)

Lighthouse 3.2: Regional Strategies for *Healthy Forest Regions*: Translating the overarching idea into practice

The *HealthyForestRegions Project* fostered sustainable forest management at the regional level by empowering decision-makers, local stakeholders, and communities to protect forest ecosystems and enhance their contributions to human well-being. A key component of the project was the development of regional strategies, which translate overarching *HFR* goals into concrete, actionable plans tailored to the unique ecological, social, and economic context of each region. These strategies were designed to guide long-term action, facilitate collaboration among stakeholders, and strengthen regional identity around healthy forests.

Regional Strategy: *HFR* project region *Schorfheide-Chorin-Odertal* (Germany)

The project region Schorfheide-Chorin-Odertal has developed a self-committing regional strategy accompanied by a concrete action plan. The strategy outlines approaches tailored to the specific conditions of the region, with the overarching goal of maintaining healthy forest ecosystems and strengthening their contributions to human well-being.

The region is located in the dynamic interface between the metropolitan area of Berlin and surrounding rural landscapes. The region is characterized by a high density of protected areas, including the *Biosphere Reserve Schorfheide-Chorin*, the *Lower Oder Valley National Park*, and the *UNESCO World Natural Heritage Site 'Grumsin Beech Forest'*, which forms part of the transnational *UNESCO World Heritage property "Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe"*. These areas represent valuable natural forest ecosystems and provide an important foundation for safeguarding biodiversity and ecosystem functions.

The main objective of the regional strategy is to preserve and improve forest health as a basis for human well-being. Particular emphasis is placed on promoting ecosystem-based and multifunctional forest management as well as landscape development that supports the long-term stability and health of forest ecosystems. In this context, the strategy aims to support decision-makers, responsible actors, and the public in protecting forests in a sustainable manner and strengthening key regulating ecosystem services, such as climate regulation, water retention and groundwater recharge, soil protection, fire prevention, air purification, and carbon storage.

The strategy is closely aligned with the *General Forest Health Strategy* and was developed through a broad participatory process involving actors from forestry, administration, research, and civil society. Scientific analyses and remote sensing maps of the region provide an important basis for identifying forest-related challenges and prioritizing measures. Strategic objectives focus on ecosystem-based, multi-functional forest management, maintaining and strengthening forest connectivity, improving water retention in the landscape, and promoting forest-friendly landscape development.

Regional Strategy: *HFR* project region *Kočevsko* (Slovenia)

Prepared by the *Slovenian Forest Service*, the strategy for the project region *Kočevsko* outlines approaches tailored to the specific conditions of the region with the overarching goal of maintaining and improving forest health for the long-term well-being of people and nature.

The strategy is based on key expert documents, including forest management plans for the Kočevje forest management region and the Ravne forest management unit, as well as the *General Forest Health Strategy* and supporting analyses. The *Kočevsko* region, which includes the municipalities of Kočevje, Kostel, and Osilnica, is characterized by a very high forest cover, a large share of state forests, extensive *Natura 2000* areas, and valuable forest reserves such as the *UNESCO World Natural Heritage Site Krokar Virgin Forest*.

Strategic objectives focus on conserving and strengthening healthy, resilient, and multifunctional forests, promoting sustainable, close-to-nature and multipurpose forest management, and maintaining ecosystem services for the benefit of people. The strategy also addresses key regional challenges such as climate

change, while building on existing opportunities, including well-preserved forest ecosystems, a strong tradition of sustainable forest management, and established support mechanisms for forest-related activities.

An ecosystem-based approach, participatory forest management, and strengthened cooperation between institutions and stakeholders form important guiding principles of the strategy. The regional strategy provides the basis for the development of a concrete action plan and contributes to the practical implementation of the *Healthy Forest Region Concept*.

Relevant *HFR* products:

Regional Strategy Schorfheide-Chorin-Odertal Germany (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Schorfheide-Chorin-Odertal-DE.pdf, *accessed on 8 April 2026)*

Regional Strategy Kočevsko Slovenia (available at: https://www.interreg-central.eu/wp-content/uploads/2026/04/HFR-Regional-Strategy-Kocevsko-SI.pdf, *accessed on 8 April 2026)*

Lighthouse 3.3: *General Forest Health Strategy* – A strategic blueprint for forest-rich regions

The General Forest Health Strategy provides the first structured framework for sustaining and enhancing forest health in *Healthy Forest Regions*. It identifies key barriers to forest health and presents strategic approaches at multiple levels to address them, forming the basis for developing detailed regional strategies.

Challenges to Forest Health

Analysis using the *Healthy Forest App* highlights that forest health is highest in large, contiguous forests distant from human infrastructure and lower along edges, in small or fragmented areas. Symptoms of reduced forest health include increasing temperatures, declining soil and air moisture, reduced species diversity, weakened connectivity, and higher vulnerability to calamities such as windfall, fire, drought, and insect outbreaks. Direct causes include unsuitable silvicultural practices, climate change, inappropriate recreational activities, inadequate wildlife management, removal of deadwood, and surrounding land use. Underlying drivers comprise fragmented governance, economic pressures prioritizing timber over regulating ecosystem services, socio-cultural expectations of "tidy" forests, conflicts between forest and game management, lack of stakeholder communication, and absence of landscape-level management approaches.

Strategic Objectives and Approaches

Objective 1: Promote ecosystem-based, multipurpose forest management

Strategic actions target institutional, economic, and socio-cultural dimensions: enhancing governance and coordination, promoting sustainable timber production while safeguarding ecosystem services, and increasing public awareness of the climate-regulating and biodiversity functions of forests.

Objective 2: Support landscape-level development

Strategies focus on preserving landscape elements that support forest health, reducing negative impacts from adjacent land use, and restoring ecological functionality to improve connectivity, resilience, and ecosystem service provision.

The strategy integrates insights from regional workshops, analyses of forest health and ecosystem significance, and the *Healthy Forest App*, providing a practical, science-based blueprint for decision-makers, forest managers, and local communities. By addressing ecological, economic, and social dimensions in a coordinated framework, it enables forests to remain resilient, multifunctional, and vital for human well-being.

Relevant *HFR* products:

HFR General Forest Health Strategy (available at: https://www.interreg-central.eu/wp-content/uploads/2026/02/HFR-General-Forest-Health-Strategy.pdf, accessed on 19 February 2026)

8. Communication strategies

The *HFR* approach is designed to foster comprehensive engagement in the preservation and enhancement of healthy regional forests across diverse stakeholder groups and societal actors. As previously outlined, the *HFR* approach focuses on engagement in three key fields of action: a) education and secondary benefits, b) ecosystem services and alternative income, and c) forest health and regional planning. In each field, the active participation and commitment of various stakeholders and actors are essential. To reach these groups and encourage joint efforts for healthy regional forests, three communication strategies have been developed. These strategies are presented in the following chapter and are intended as an initial source of inspiration and guidance for spreading the *HFR* idea further.

8.1. Communication strategy - Education & secondary benefits

The communication objective is to anchor the value of forest ecosystems in the project target regions by informing residents and visitors about the contributions of forest ecosystem services to human health and well-being and making this knowledge tangible in practice. Through the exploration and piloting of new opportunities for sustainable regional value creation, the communication work further aims at attracting young people to the region by providing new perspectives for rural life.

Strategic approach: Communication is **evidence-based, action-oriented, and regionally tailored**, combining participatory formats, forest-based experiences, and hands-on engagement. Messages are clear, professional, and motivating, emphasizing practical solutions rather than abstract principles. By linking scientific knowledge with direct experience, the strategy encourages awareness, behavioural change, shared responsibility, and regional identity building.

Key Messages:	
1	A healthy forest can be described as a diverse network made up of trees in connection with other plants, animals, fungi and microorganisms that is strong enough to survive without losing its vitality and balance in the long term.
2	Healthy forests provide a diverse array of ecosystem services, which are essential benefits that people derive from ecosystems. They form the foundation for human health and well-being.
3	An ecosystem-based forest management safeguards ecosystem services keeping forests healthy and functional.
4	The value of healthy forests for human well-being is the basis for a sustainable, regional development towards a Healthy Forest Region.

Target audiences:
▪ **Educators and multipliers** (teachers, forest education actors) – to disseminate knowledge and promote awareness.
▪ **Sectoral agencies** (environment, education, tourism, planning) – to inform decision-making, governance strategies, and sustainable development approaches.
▪ **General public and local communities** – to increase awareness, foster participation, and encourage responsible behaviour.

▪ **Interest groups and NGOs** – to enhance capacity, collaboration, and engagement in forest stewardship.

Communication channels and tools:
▪ Evidence-based, accessible information through websites, newsletters, and media
▪ Participatory and experiential formats: workshops, excursions, field-based learning, and guided interactions
▪ Educational packages and outreach materials for schools, educated members of public, and community groups
▪ Interdisciplinary and cross-sector networking and exchange forums
▪ Awareness-raising through regional identity campaigns, promotional products, and local events

Guiding communication principles:
▪ Action-oriented and motivating rather than prescriptive or moralizing
▪ Inclusive, participatory, and regionally adapted
▪ Evidence- and data-based
▪ Enhanced through forest-based experiences and hands-on engagement
▪ Clear, professional, and precise
▪ Emphasis on tangible outcomes, shared learning, and capacity-building

8.2. Communication strategy - Ecosystem services & alternative income

Communication objective: The focus is on raising awareness for and knowledge about the opportunities provided by forest ES for regional development. New opportunities through PES can offer additional income for forest owners and managers who implement close-to-nature forest management practices. Local, regional and national public authorities, sectoral agencies, forest owners and managers as well as private sector and investors, are targeted to gain a broader awareness for PES and how these tools support nature protection while balancing sustainable socioeconomic development by creating economic benefit and additional income sources.

Strategic approach: Communication is evidence-based, participatory, and action-oriented, linking scientific knowledge with practical examples and pilot experiences. Messages are delivered in a clear, professional, and regionally tailored way, emphasizing solutions and tangible benefits for forest owners, authorities, and local communities. Participatory formats, workshops, and pilot actions allow stakeholders to co-create strategies, test PES mechanisms, and exchange knowledge. Communication uses both digital and offline channels to maximize reach and impact.

Key messages:	
1	Forest ES can provide alternative income streams while enhancing biodiversity, carbon storage, and ecosystem resilience.
2	PES schemes create win-win solutions for ecosystem-based, close-to-nature forest management and local economic development.
3	Evidence-based frameworks and pilot actions demonstrate how PES can be operationalized and marketed successfully.

4	Collaboration among authorities, forest owners, sectoral agencies, and stakeholders strengthens legitimacy and ensures effective implementation.

Target audiences:

- **Local, regional, and national public authorities** – to support decision-making, adopt governance strategies, and implement socio-ecological frameworks for sustainable forest management.
- **Sectoral agencies** – to integrate PES and forest ES strategies into planning, development, and conservation initiatives.
- **Forest owners and managers** – to explore alternative income sources, implement PES schemes, and contribute to ecosystem resilience.
- **General public and local communities** – to increase awareness of forest ES, promote participation, and foster sustainable behaviours.
- **Interest groups and NGOs** – to engage in pilot actions, capacity-building, and advocacy for forest stewardship.
- **SMEs and regional businesses** – to explore opportunities for value creation through sustainable forest-based products and services.

Communication channels and tools:

- Digital dissemination: websites, newsletters, social media
- Evidence-based materials: policy briefs, concepts, and best-practice guidelines
- Participatory formats: workshops, expert groups, networking forums
- Pilot projects and field demonstrations linking PES implementation to tangible regional benefits
- Marketing concepts for PES-based value creation, distributed through local events and informational materials

Guiding communication principles:

- Action-oriented and motivating rather than prescriptive or moralizing
- Inclusive and participatory, engaging multiple sectors and stakeholders
- Regionally adapted and context-specific
- Evidence- and data-based
- Emphasis on practical solutions, pilot-tested approaches, and shared learning
- Clear, professional, and precise tone

8.3. Communication strategy - Forest health & regional planning

Communication objective: In this field of action, communication activities aim at raising awareness among policy- and decision-makers on all levels for local and regional values of forest ES and supply solutions for increasing forest resilience towards negative impacts. The objective is to influence the attitude and behaviour of actors such as national, regional and local public authorities, sectoral agencies and key stakeholders to contribute to risk reduction in order to safeguard functional forest ecosystems for biodiversity conservation and provision of ES.

Strategic approach: Communication is evidence-based, participatory, and action-oriented, combining analysis of socio-ecological and institutional frameworks with regional pilot projects and stakeholder

consultation. Messages are clear, professional, and regionally tailored, highlighting practical solutions and tangible benefits. Participatory workshops, online sessions, and direct consultation with authorities ensure co-creation of strategies, strengthen local ownership, and promote understanding of governance roles. Communication is complemented by dissemination through websites, newsletters, and media channels.

Key messages:	
1	Healthy forests provide critical ecosystem services that support biodiversity, human well-being, and regional resilience.
2	Coordinated, cross-sectoral governance is essential to safeguard forest ecosystem functionality.
3	Evidence-based analyses and pilot strategies guide practical implementation and informed decision-making.
4	Participation of authorities, institutions, and stakeholders strengthens legitimacy, capacity, and long-term stewardship.
5	Operational frameworks and strategies provide actionable guidance for sustainable forest management, alternative income generation, and regional development.

Target audiences:

- **Local, regional, and national authorities** – to adopt governance strategies, socio-ecological frameworks, and management concepts.
- **Sectoral agencies** – to integrate recommendations into planning and sectoral development strategies.
- **Higher education and research institutions** – to use strategies and concepts for teaching, research, and applied science.
- **Forest owners, managers, and SMEs** – to implement sustainable forest management and explore alternative income streams.
- **General public and local communities** – to understand the value of forest ES and adopt supportive behaviours.
- **Interest groups and NGOs** – to enhance engagement, advocacy, and local stewardship.

Communication channels and tools:

- Policy briefs, technical reports, and evidence-based summaries
- Participatory workshops, online consultations, and stakeholder forums
- Pilot actions and regional case studies for practical demonstration
- Project and partner websites, newsletters, and social media
- Media coverage in local, regional, and national outlets
- Networking formats connecting authorities, experts, and local actors

Guiding communication principles:

- Action-oriented, motivating, and inclusive
- Evidence- and data-based
- Regionally adapted and context-specific
- Clear, professional, and precise

- Participatory and co-creative

Emphasis on tangible outcomes and practical guidance

9. Summary and future development

It is foreseeable that climate change, global population growth, increasing resource scarcity, and intensive land use will continue to intensify pressure on regional ecosystems. At the same time, the resilience and self-regulatory capacity of forest ecosystems are critical to addressing these challenges. Healthy, well-functioning forests not only mitigate the impacts of climate change but also help address its root causes. They recharge regional groundwater reserves, purify the air, regulate temperatures, and reduce natural hazards.

This constellation creates a clear need for action — particularly for regional decision-makers. The *Healthy Forest Regions* idea responds to this need by offering a forest-based regional development approach tailored to forest-rich regions. Over a three-year implementation period, the *HealthyForestRegions Project translated* this idea into practice by consolidating the idea into a coherent framework — the *HFR Concept* — and by laying the first foundations for its realisation at the regional level.

The *Healthy Forest Regions* idea establishes a framework for holistic, regionally coordinated engagement under a shared vision, bringing together stakeholders to actively promote forest health and the associated human well-being. It is intended to strengthen regional identity as a forest-rich area — an identity linked to both specific privileges and particular responsibilities — and to enhance appreciation of forests and their essential ecosystem services. Measures implemented within the *HFR Project* have demonstrated the tangible and dynamic added value this approach can generate for forest-rich regions in Central Europe. These measures included, among others, the establishment of multiple forest classrooms, the development of ongoing local recreation offers, the assessment and preparation of regional forest ecosystem services for valorisation, the development of an app for diagnosing regional forest health, and the initiation of two in-depth regional processes aimed at repositioning forest health across multiple levels of policy-making, public administration, and forest management.

With the *HFR Concept*, the idea and the practical experience gained were elevated to an action-oriented conceptual level. This framework is designed to enable stakeholders in other forest-rich regions to engage with regional forest health in a structured and organised manner. The concept should be understood as a starting point for such engagement. The specific pathway of a Healthy Forest Region will depend on a range of contextual factors, including:

- the development of socio-ecological conditions within the region;
- the availability of funding to initiate and/or sustain the process;
- the strength of regional networks and the potential for their further development;
- the level of openness and willingness among decision-makers and the general population to engage with the topic;
- and the synergies that may emerge through collaboration with other *Healthy Forest Regions*.

Looking ahead, it is recommended to embed *the Healthy Forest Regions* idea within established networks (such as the UNESCO World Heritage Beech Forests network), to actively pursue external funding in order to secure the resources and capacities required for implementation, and to follow a step-by-step approach that emphasises participatory governance and shared responsibility.

By acting collectively and strategically, regions can position forest health as a cornerstone of sustainable development and long-term societal well-being. In this sense, the *Healthy Forest Regions* approach invites regional decision-makers to actively shape resilient forest landscapes — today, and for future generations.