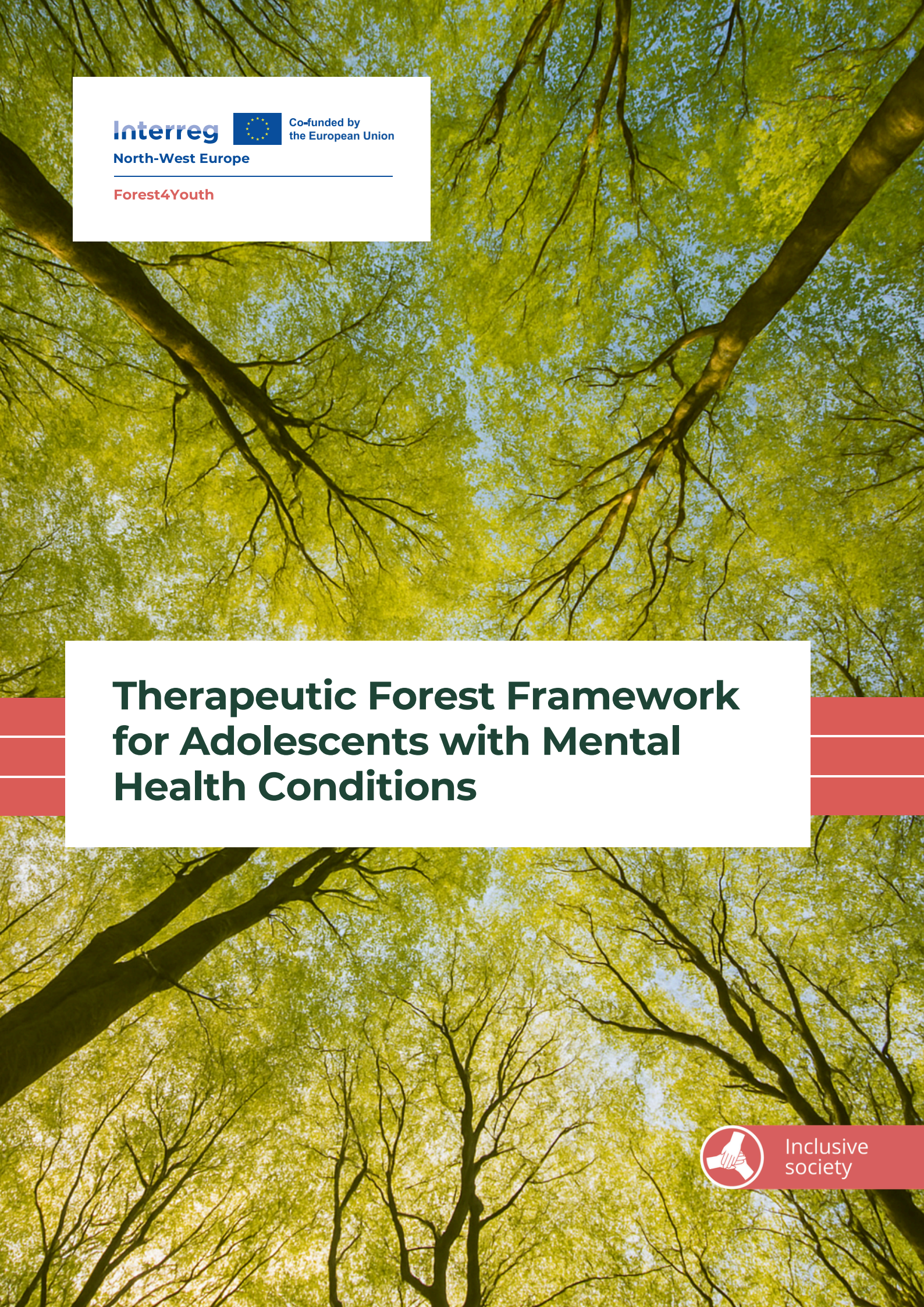

Interreg
North-West Europe

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Forest4Youth

Therapeutic Forest Framework for Adolescents with Mental Health Conditions

Inclusive society

Which forest environments are most beneficial, for which adolescents, and why?

An evidence-based framework

This document presents the Therapeutic Forest Framework developed under the Forest4Youth project. Building on established evidence that forests support mental health, it addresses a more specific question: which forest environments are most beneficial, and which characteristics make them suitable for welcoming adolescents in mental health care.

This is a conceptual document that provides the foundation for a practical assessment tool, which will be developed in the next phase of the project. Together, these elements support the selection and preparation of forest sites for therapeutic immersions across the North-West Europe partner regions.



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This framework reads as a whole: six sections that run from the starting question to the practical tool.

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SECTION 1

Purpose and scope

A common language to identify forests suited to therapeutic use with adolescents in mental health care.

What this framework defines

This document defines the key concepts and principles that guide the identification of forests suitable for therapeutic use with adolescents in mental health care. It establishes a shared understanding of the criteria that underpin the selection of therapeutic forest sites.

Who this framework is for

The framework is primarily addressed to foresters, site managers, forest guides, and clinicians involved in preparing and delivering therapeutic immersions. It is available in English, French, and German to ensure consistency across partner regions.



SECTION 2

Why the project needs a framework

A diversity of forests, a diversity of effects

The positive effects of forests on mental health are well established, both in the scientific literature and in existing practice across partner regions. However, an essential question remains: under which conditions do these benefits occur most effectively? Forests vary significantly in their characteristics, and they cannot be treated as interchangeable settings. Where adolescents in mental health care participate in therapeutic immersions ranging from short sessions to extended stays, the quality of the environment plays a determining role in shaping the experience.

Constraints to anticipate

Some limitations are physical, including safety risks such as unstable terrain or hazardous vegetation. Others relate to lived experience: environments that are degraded, overly dense, monotonous, or visually unappealing may fail to support positive emotional responses.

A framework that addresses this variability

This framework addresses this variability by identifying the key forest characteristics associated with therapeutic benefits. It provides a structured basis for selecting and preparing forest environments that can effectively support the intended mental health outcomes.

SECTION 3

How this framework was built

Four sources of knowledge, combining documentary review and direct exchanges with the field. The framework draws together four sources of knowledge. They combine documentary review (a–b) with direct exchanges (c–d).

A review of the scientific literature

a

Around sixty recent scientific publications were gathered and examined. The features that recur across the literature include exposure to nature, the forest landscape, forest structure and management, tree and plant diversity, forest volatile organic compounds, birdsong within the soundscape, and the presence of water. The benefits most frequently reported in relation to mental health are attention restoration, emotional regulation, stress relief, and support for cognitive functions and memory.

A review of existing practice

b

The frameworks and certifications that already define therapeutic forests in Europe and Asia converge on a recognisable set of assessment criteria covering the forest stand, the soundscape, air quality, the landscape and the visitor experience. They also show that a therapeutic forest can be defined for different aims, from general recreation and prevention to clinical care.

The work of Pan Bern, a Swiss study office

c

A method for estimating the health benefits of different forest stands, developed by Pan Bern in its applied research project, strongly inspired the direction taken here.

Field interviews

d

Interviews were carried out with mental health practitioners, patients and their families and carers, public authorities, immersive virtual nature technology developers, and foresters as well as forest guides. A thematic analysis of the transcripts examined the physical, sensory and atmospheric attributes that participants named as important for wellbeing.



What practitioners and families say

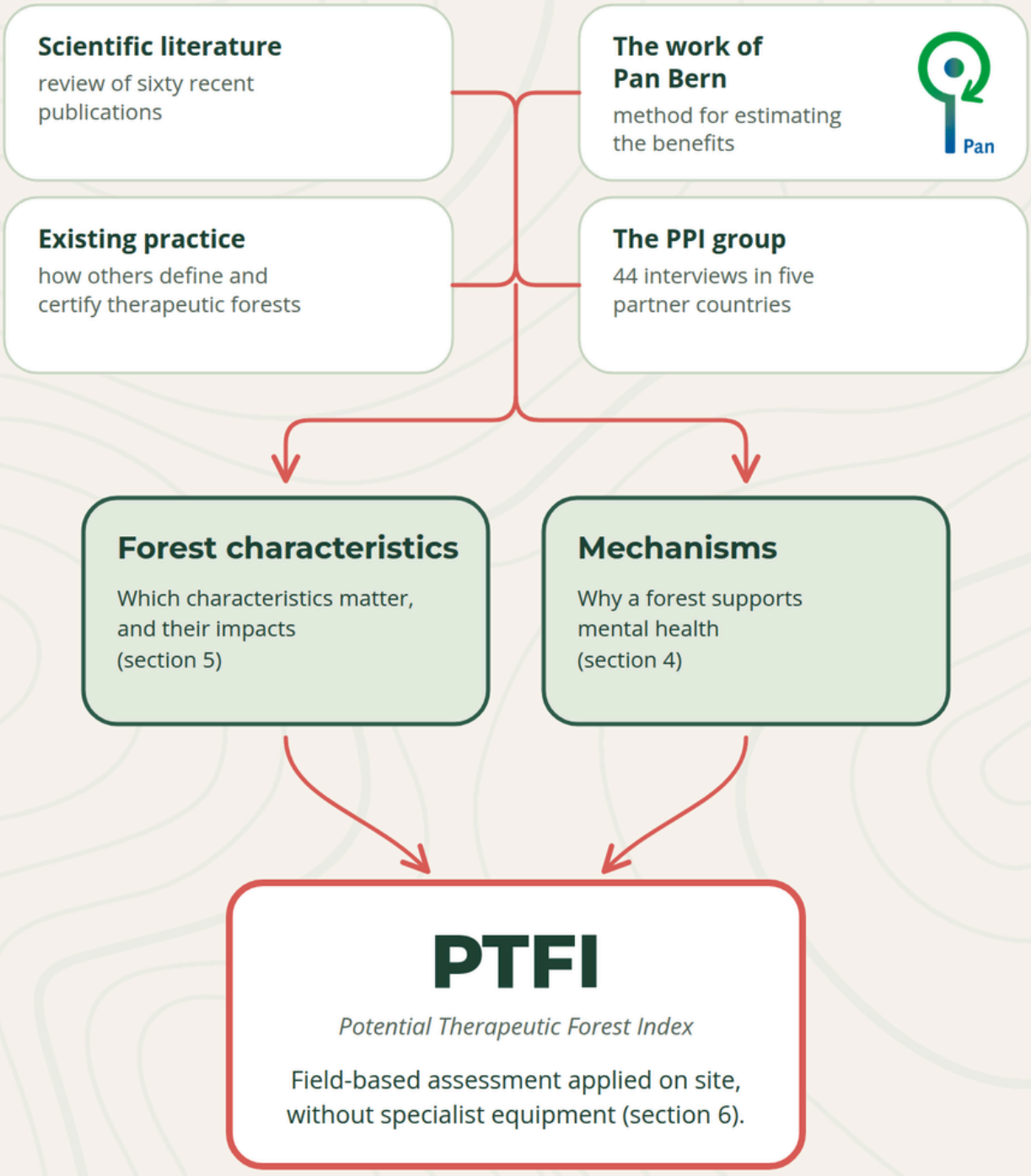
Asked what connects the forest to a young person's wellbeing, participants named specific things rather than general qualities. Light was valued for the way an open, well-lit entrance helps an anxious young person arrive and settle before moving into denser stands. The soundscape was described with precision, from species-specific birdsong to rain on leaves, along with the difficulty that silence can pose for an anxious patient. Water where it meets woodland was called “the golden ticket” by some practitioners. Smell drew the most emotionally charged responses and was held to be the hardest attribute to reproduce artificially, which participants linked to the volatile compounds trees release. Touch, from the texture of bark to bare feet on the forest floor, often served as an entry point. Above all, participants repeatedly highlighted the forest's diversity and constant change, the layering of old and young growth and the sense that no two visits are ever the same, as what distinguishes it from gardens, sensory rooms and other green spaces.

What these sources have in common

Taken together, these sources point in the same direction. They identify both the mechanisms through which forests support mental health and forest characteristics that enable those mechanisms. The next two sections examine each in turn.

How this framework was built

From sources of knowledge to the characteristics of a therapeutic forest, up to the assessment tool.



SECTION 4

Why a forest supports mental health

Current evidence suggests that a number of overlapping mechanisms explain why an appropriately selected forest supports mental health. Section 5 examines the forest characteristics that give rise to them.

Attention restoration

A natural environment gently engages an involuntary form of attention, often referred to as soft fascination, which allows directed attention to recover; pressing concerns tend to ease without conscious exertion.

Stress reduction and down-regulation

Contact with nature prompts a measurable easing of physiological stress: lower arousal and calmer autonomic responses. As the nervous system down-regulates, cognitive, emotional and sensory processing becomes more effective.

Sensory re-engagement

A forest offers rich sensory stimulation without being pressing or overwhelming, a marked contrast with constant digital stimulation. These sensory experiences often become the most vivid memories for many young people.

A different sense of self

In the forest the patient role recedes. A young person is entrusted real tasks, is relied upon, and comes to experience themselves as a capable individual.

Visual pattern processing

The forest presents calming green tones and repeating natural patterns known as fractals. The visual system processes these patterns with less effort than the sharper edges typical of urban environments, which eases mental fatigue.

Physiological and immune effects

Biogenic volatile organic compounds released by trees, often referred to as phytoncides, may contribute to reductions in physiological stress markers; forest air is also cooler and carries markedly less fine particulate matter.

Social connection and trust

Shared, non-pressing tasks let bonds form without pressure; the usual distinction between caregiver and patient softens.

Physical release

Moving, carrying and building things allow tension to be relieved through purposeful activity, something the setting naturally affords.

SECTION 5

Which forest characteristics matter, and their impacts

The scientific literature, the existing certification frameworks and the preliminary assessment work converge on a consistent set of forest characteristics. The table below brings these together, describing each characteristic and its potential contribution to the mental health of young people during therapeutic forest immersions.

This assessment is not intended as a pass/fail checklist: no single criterion is exclusionary, and therapeutic forests are not expected to meet every recommendation.

FOREST CHARACTERISTIC	WHAT IT REFERS TO · IMPACT
Tree and species diversity	**A mixed stand with a range of species and changes along the route, rather than a uniform plantation.** A varied, living stand offers richer sensory variety; it reads as healthy and engaging, which supports interest and mood. Seasonal change adds to this, renewing the sensory experience across a programme.
Stand density, openness and spatial variety	**A balanced density, neither too dense nor too sparse, ideally with both open and more enclosed areas within the same site.** Too dense feels dark, enclosed and unsafe; too sparse loses the sense of immersion. A balanced density gives openness, ease of movement and a feeling of safety.

Canopy and light

Crown cover and the play of light, including natural clearings.

Filtered, dappled light and a stable forest interior climate are central to the calming effect; clearings bring light, openness and a change of scene.

Forest structure and floor

Vertical layering and a varied floor: deadwood, old trees, roots, mosses, wildflowers, fungi.

Structural variety and the visible signs of a living, undisturbed environment make the forest feel rich and authentically alive, which strengthens the sense of naturalness and deepens immersion.

Soundscape and tranquillity

Natural sounds such as birdsong, wind and water clearly dominant over human-made noise, with road and machinery noise minimal or absent.

A serene, natural soundscape is one of the strongest drivers of restoration and calm; intrusive human noise undoes much of the benefit.

Air and forest scents

Clean air, low in allergens, carrying natural scents and volatile compounds (monoterpenes).

Forest air and volatile organic compounds are linked to lower stress and physiological benefits; distinctive scents deepen sensory immersion.



Water and focal features

Streams, ponds or wet zones, and notable features such as old trees, viewpoints or meadows.

Water features are consistently linked to reduced stress and enhanced mood, whereas visually salient elements in the landscape can anchor attention and memory via low-demand (“soft”) fascination processes.

Naturalness and discreet management

Few visible signs of forestry operations; infrastructure barely noticeable.

An untouched, trustworthy appearance supports the sense of being away from daily life and sustains immersion.

Terrain and trails

Varied terrain and a network of paths of different lengths, including short, winding, legible routes.

Varied, winding routes invite gentle movement and exploration that can be adapted to different abilities and energy levels.

Welcome and accessibility

A meaningful entrance or threshold, a defined forest edge as a meeting point, rest areas, reachable access and basic facilities.

A clear, reassuring threshold and accessible, comfortable spaces let a vulnerable group arrive, settle and feel held, which is a precondition for everything else. A defined edge and a gathering point also support the arc of a session, marking the passage from everyday life into the forest and back. For these groups, the sense of refuge, enclosure and safety often matters more than open views.





Safety and exclusion conditions

Alongside these enabling qualities, certain conditions may make a site unsuitable, however attractive it may otherwise appear. A strong presence of biting insects or tick habitats, unstable terrain, stinging or toxic vegetation, very low biodiversity (a monotonous pine stand, for instance, can feel gloomy and lifeless) and visible environmental degradation can all disrupt a therapeutic programme or even worsen a young person's condition.

These factors act as constraints rather than qualities to be traded off: a genuinely therapeutic forest must be both rich enough to help and safe enough to host. As the foresters put it, the aim is a site that is as safe as necessary rather than risk-free, with potential hazards identified and planned for.

⚠ In peri-urban parks, additional criteria apply

× Favour quiet times and quiet places.

× Anticipate sharing the space with other users.

× Avoid periods with a high frequency of sport and cultural events.

× Take background noise and peak visitor times into account.

× Avoid the surroundings of playgrounds and leash-free dog zones.

× Exclude sites exposed to continuous traffic noise.

Taken together, the characteristics in the table and these safety conditions describe what it means, in practice, to welcome adolescents well in the forest. A site is best assessed jointly, by the forester and the care team together. Drawing on the foresters' experience, this should involve visiting the site beforehand, often more than once before a programme begins, so that a site's suitability is established collaboratively rather than assumed.

One further consideration sits alongside the forest's own qualities rather than among them. A site that lends itself to delivery is one where local partners, such as an NGO, a nature guide or the managers of the green space, can support the activities on the ground. Clinical teams rarely have the capacity to organise nature activities unaided, for instance in a peri-urban forest context. The availability of such partners is therefore worth weighing when a site is chosen, as a practical enabler rather than a scored criterion: its absence does not make a forest unsuitable, but its presence makes a programme far easier to sustain.

SECTION 6

From theory to a practical tool

The purpose of this framework is to establish the reasoning above. Turning that reasoning into a usable instrument is the next step: translating these characteristics into a simple, field-based assessment that a forester or clinician can apply on site without specialist equipment. The chosen approach follows the logic of the Potential Biodiversity Index (IBP), an established tool that estimates a stand's potential from a few directly observable indicators. The resulting instrument, called the **Potential Therapeutic Forest Index (PTFI)**, will be developed and field-tested later, with its detailed design and scoring documented separately. It is mentioned here only to show where this groundwork leads.

Alongside these characteristics, therapeutic use of a forest also carries a responsibility toward the site itself: taking waste away, respecting breeding and rearing seasons, giving encountered wildlife a respectful berth, and noticing protected plants and fungi.



Conclusion

The characteristics set out in this framework, together with the safety conditions, describe what it means in practice to welcome adolescents well in the forest. They translate an established body of evidence into a usable understanding of the kind of forest environment that best supports young people in care, and provide a shared basis for selecting and preparing therapeutic forests across North-West Europe.

It remains a working document: as therapeutic forests are identified and activities run within them, this practical experience may refine the characteristics, and the framework will be adjusted accordingly if necessary.



LEGAL AND REGULATORY NOTICE

This framework is for informational and professional development purposes only. It does not constitute legal, clinical, or regulatory advice.

Practitioners are responsible for ensuring all activities comply with applicable health and safety, safeguarding, data protection, and professional standards in their jurisdiction. Requirements vary across Belgium, France, Germany, Ireland, and Luxembourg; local legal frameworks always take precedence over this framework.

This framework does not replace clinical protocols, risk assessments, or governance requirements set by your organisation or regulatory body. All activities involving vulnerable young people must fall within the practitioner's scope of practice and receive appropriate supervision and any necessary approvals.

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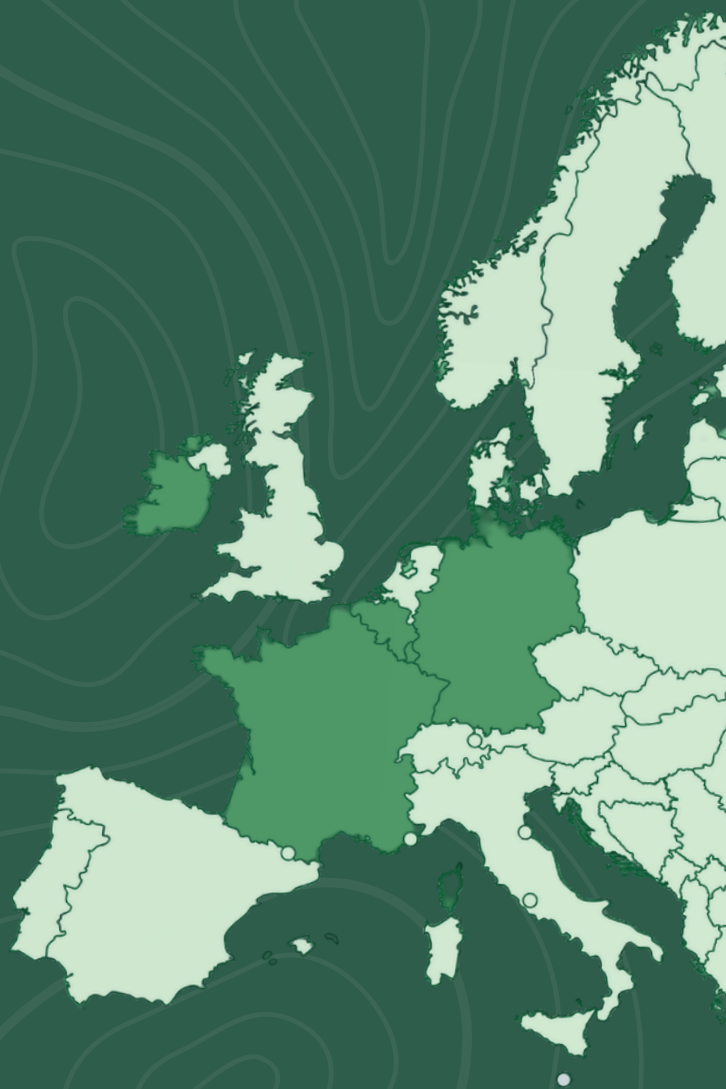

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€3.3 million

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2025 - 2028

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