6TH INTERNATIONAL CONGRESS ISFT FOREST AND ITS POTENTIAL FOR HEALTH

18th to 20th September 2024, Druskininkai, Lithuania



Association "Gyvo Žalio" Lithuanian University of Health Sciences

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Table of Contents

Key presentations:

- 1. From Timber to Welfare: Forest Policy Paradigm Shift in Korea Won Sop Shin
- 2. Development of Forest Therapeutic Tourism and Climate Resorts in Slovenia: An Attribute Theory Approach **Darija Cvikl**
- 3. FTHub Forest Bathing and Forest Therapy, a Method and Model for Professionalism and Commitment to Science **Alex Gesse**
- 4. Effects of Landscape Structures on Human Health Results of a Systematic Review and a Survey **Gisela Immich**
- 5. Steps Towards Mainstreaming Forest Benefits for Public Health in Finland Liisa Tyrväinen
- From Theory to Practice in Therapeutic Ornithology: Integrating Birds, Psyche, and Health -Piotr Tryjanowski and Sławomir Murawiec

Sessions:

1A. Nature intervention applications for Mental Health and Wellbeing

- 7. Effects of Forest Therapy on Mental Health and Psychological Wellbeing Giedrė Žalytė
- 8. How Forest Therapy Supports and Increases the Effectiveness of the 12-Step Program in Addiction Rehabilitation **Manuela Siegfried**
- 9. Forest Therapy Sciences and Practices in Taiwan Chia-pin Yu
- 10. "You Are Not Alone": Reduction of Feelings of Loneliness Through Relationships with Nature **Paulina Patro**
- 11. Nature's Rx: Harnessing the Healing Power of the Great Outdoors for Mental and Physical Wellness Lolita Rapolienė

1B. Nature based health solutions in different landscape structures

- 12. Detroit Therapy Forest: Fostering Environmental and Social Resilience in a Post-Industrial City **Paul Draus**
- 13. Using the INFTA* Methodology to Create a Nature Therapy Trail in a Protected Territory: A Case Study Linas Daubaras
- 14. The Infinitely Small Are Infinitely Great: Forests, Microbes, and Human Health Jake Robinson
- 15. Nature Environments Fostering Leadership Skills **Mervi Varhelahti, Irina Katajisto-Korhonen**
- 16. Forests and Urban Green Spaces as a Comprehensive Framework for Enhancing Holistic Health and Promoting Sustainable Wellbeing **Inga Gurauskienė**

2A. Non wood economy: Developing Forest Therapy Tourism and Healing Forests

- 17. Göttweig Healing Forest: A Best Practice Model for Health and Tourism Integration **Udo Braendle**
- 18. From Healing Forests to a One Health Region: A Transformation Concept for Western Pomerania **Stefan Seiberling, Susanne Henne**
- 19. The Expected Benefits of Establishing a Healing Forest: Druskininkai Forest Study **Stanislovas Čepinskas**
- 20. Regenerating People and Planet An Intersection of Tourism and Nature Connection Practices Beàta Szablics

2B. Forest Interventions in Practice: Practical Applications and Legal Considerations

- 21. The Right to Work in the Case of Forest Therapy: Legal Perspective **Gintarė**Tamašauskaitė-Janickė
- 22. The Importance of Forest Bathing for Businesses Liz Dawes
- 23. Mindfulness and Forest Therapy: Commonalities, Differences, and Possibilities Alicja Juškienė
- 24. From Digital Detox to Green Transition: Incorporating Forest Therapy into Our Triple Transformation Approach **Ela Kurtcu**

Symposium A. Nature - green prescription - integrating Nature into Healthcare system

- 25. Tailor-Made Forest Therapy: Scenarios for Various Groups in Practice of the Polish Forest Bathing Association **Katarzyna Simonienko**
- 26. Nature on Prescription Eva Dalum Olsen
- 27. New Approach in Healthcare Including Nature-Based Treatments for Vulnerable Populations **Anna Maria Pálsdóttir**
- 28. What Do People Living With Cancer Think About Forest Bathing? A Content Analysis Maurizio Droli
- 29. The use of hospitals' health forests in Finland Maija Lipponen

Symposium B. Forest Ecosystems: A Foundation for Human Health

- 30. Health Potential of Estonian Forests Testing Shinrin-Yoku Methods Simon Bell
- 31. Urban Forests and Deadwood as Indicators of a Beneficial Environment for Human Health Marja Roslund
- 32. Forest Bathing Experience and Its Relation to Biophysical Characteristics of Forests **leva Misiūnė**, **Ričardas Skorupskas**
- 33. Exploring Phytochemical Profiles in Coniferous Swamp Forests: Ericaceae Plants as a Source for Medicinal Uses **Lina Raudonė**
- 34. Unlocking Nature's Pharmacy: Isolating Novel Pharmaceuticals from Plants and Forests **Uwe Rinner**

3A. Children's Health and Well-being

- 35. The Profound Learning Experiences for Children Through Forest Therapy Hiroko Ochiai
- 36. Urban Rewilding, Microbiota, and Immune Response in Intervention Trials Aki Sinkkonen
- 37. Forest Kindergarten as a Space for Building Interspecies Relationships Hanna Łoboda
- 38. Children's Health Forest, a Model Project in Mecklenburg-Western Pomerania/Germany **Armin Stöhr**
- 39. The Effect of Residential Greenness and Physical Activity on Children's Mental and General Health: A Kaunas Cross-Sectional Study **Sandra Andrušaitytė**
- 40. Europe's First Children's Health and Healing Forest Children's Health in Transition **Karin Lehmann**

3B. Forest protection and sacred value, forest and human relation

- 41. Old growth and mature forests: spiritual values and values for human spiritual health -an European perspective **Josep-Maria Mallarach**
- 42. Biodiversity and Old-Growth Forests: What's Unique in Lithuania and Why It's Important to Preserve Them **Mindaugas Survila**
- 43. Sacred Forests in Lithuanian History: What Will Be Their Role in the Future? **Vykintas**Vaitkevičius
- 44. How Can Science Prove That Plants Sense? Vilma Kisnierienė
- 45. Rafaeleseden: The Value of Conserving Sacred Pristine Forests and Their Healing Power **Moises Hernandez**

Posters and Workshops

- 46. Nature Schools of Protected Areas A Base for Perception and Understanding of Nature **Rūta Baškytė**
- 47. Sophrology and Shinrin-Yoku: Complementarity in the Service of Human Health Lancelot Alain
- 48. Partnership Between Society, Government, and Business: A Case of Lithuania's National Agreement on Forests **Aistė Griškonytė**
- 49. Children in the Forest: Evolution of Human-Natural Environment Relations and Their Representation in Artworks **Eglė Januškienė**
- 50. Enhancing Student Well-Being Through Nature-Based Workshops: A Qualitative Study on Educational Use of Parks **Aida Norvilienė**, **Eglė Tamašauskaitė**
- 51.A Comparative Study of Terpenes in Needles and Air in Kranjska Gora, Slovenia **Urška Rozman**
- 52. Forest Pedagogy A Compulsory Subject of Forestry Education in Lithuania **Jolanta Stankevičiūtė**
- 53. Embodied Connections: Exploring Somatic Experience in Nature Živilė Virkutytė
- 54. The Power of Forest Walks Beneficial Effects on Personal, Professional, and Planetary Well-Being Malgorzata Zieba, Magdalena Fabjanowicz

From Timber to Welfare: Forest Policy Paradigm Shift in Korea.

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HIGHLIGHTS:

- The Republic of Korea successfully transformed its denuded land into rich forests in less than 70 years.
- The Korea Forest Service facilitated Forest Therapy to utilize forests for enhancing health and quality of life for the public.
- As a public interest in wellbeing has been rising in recent years, the Korea Forest Service has been promoting the legislation and forest policy.

Abstract: Korea's forests account for about 2/3rd of the total land area. The Republic of Korea successfully transformed its denuded land into rich forests in less than half a century. There has been a continuous increase in the number of people visiting forests, and 81.3% of the Korean people visit forests more than once a year. The Korea Forest Service (KFS) facilitated 'Forest Therapy' to utilize forests for enhancing health and quality of life. The KFS has legalized the concept of forest therapy and launched a forest therapy instructor system to develop and manage forest therapy programs. The Forest Welfare Promotion Act (Republic of Korea, 2015) was promulgated to contribute to improving people's health and quality of life. The law prescribes conditions for promoting their happiness through the provision of systematic forest-based welfare services, defined as services rendered based on forests, such as forestry culture and recreation, forest education and forest therapy. The use of forests is becoming more complex, and the outcomes are becoming more significant to people, especially to urbanites. There can be little question that the priority and resources accorded to the forest in the future will be largely shaped by the extent to which sound research demonstrates that the forest environment can improve health outcomes.

Keywords: forest use pattern; forest welfare; forest therapy

Development of Forest Therapeutic Tourism and Climate Resorts in Slovenia: An Attribute Theory Approach.

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HIGHLIGHTS:

- The tourist attractiveness of forests attributive theory approach.
- Establishing the groundwork for forest therapy tourism, climate resorts and state-accredited educational programs.

Abstract: The presentation will highlight the importance of ensuring institutional conditions for utilizing the socio-cultural values of forests for beneficial and therapeutic purposes in the development of forest therapy tourism. The presentation will emphasize the significance of assessing the tourist attractiveness of forests based on attributive theory. Also, the therapeutic and healing effects of forests on tourists will be presented, as well as foundations for the development of climatic resorts and accredited study program for Forest Therapy Practitioners, certified at the state level by the Ministry of Education of the Republic of Slovenia. These findings will be considered in the further development of Slovenia's tourism strategy and in strengthening the overarching national brand, Slovenia green umbrella brand, which is fundamentally green, active, and healthy.

Keywords: Forest Therapy Tourism; Attributive theory; Tourist attractiveness, Climate Resorts.

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FTHub Forest Bathing and Forest Therapy: A Method and Model for professionalism and a commitment to science

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HIGHLIGHTS:

- Enhancing Well-Being with Forest Bathing and Forest Therapy: Bolstered by the Liquid Interactions Model (LIM) and FTHub Method, forest bathing significantly enhances well-being and nature connection in various worldwide settings.
- Research Collaborations: The NATURELAB Project as an Example: The 5.9 million euro Horizon
 European-funded NATURELAB project exemplifies research collaboration by testing Fthub
 Components of Nature-based interventions such as the LIM Model and FTHub Method. It aims to
 train 600 healthcare professionals, distribute educational materials to 8,000-10,000 professionals,
 and validate nature-based interventions across 18 sites in five countries, benefiting 4,000
 participants. This project strengthens collaborative research among 14 consortium members.

Abstract:

Forest bathing, a practice involving slow, mindful walks in nature, has been shown to enhance our connection to nature and improve overall health and well-being. Despite its benefits, variations in the activities and guidance provided during forest bathing sessions necessitate further research to identify the specific elements and senses that contribute to these positive outcomes. In this context, we will explore forest therapy training, networking, and research initiatives, including the Forest Therapy Institute Research Lab, aimed at fostering collaborative research. Key topics include the FTHub Method and the Liquid Interactions Model (LIM) as integral components of Forest Therapy interventions within the Horizon European-funded NATURELAB project. This project, with a budget of 5.9 million euros, involves 14 consortium members and aims to train 600 healthcare professionals, providing educational materials to 8,000-10,000 professionals. It will implement and validate nature-based interventions for specific health conditions across 18 sites in five countries, involving 4,000 participants.

Keywords: forest bathing; forest therapy; well-being; emotional state; nature connection; feelings; self-reported; natural elements; senses; sociodemographic

Effects of landscape structures on human health – results of a systematic review and a survey

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HIGHLIGHTS:

Green and blue spaces as contextual factors of nature-based interventions are of increasing interest due to their potential health-promoting effects on human health, with varying levels of evidence.

It is unclear whether nature-based interventions itself or its interaction with contextual factors, particularly the natural environment, produces additional health benefits. There is a lack of evidence on the possible effects of different landscape features and their impact on health or health-related outcomes, including unintended consequences.

A systematic review examines nature-based interventions in different landscape structures and their effects on human health. Additionally, a representative survey on the effects of natural landscape features on human health was conducted in Germany and Austria in 2024.

From 7,676 records, 6,244 articles were screened for title and abstract, of which 82 articles were screened for full text. The 43 included articles were conducted in 17 countries and examined different nature-based interventions in various landscape types. The frequency and duration of interventions ranged from 2-120 minutes to several days or three weeks in nature. The heterogeneity of landscape elements is very high, as is the evidence for health outcomes. The survey results (N=2,360) show that green and blue landscapes are rated differently in terms of their perceived positive and negative health effects.

The systematic review provides insights into the health effects of nature-based interventions in different natural areas. The representative survey shows the positive aspects of landscape features and indicates which landscape structures have positive or negative effects on human health.

Keywords: Nature-based intervention, green and blue spaces, health effects, public health, health-promoting landscape.

Steps towards mainstreaming forest benefits for public health in Finland

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HIGHLIGHTS:

- Research findings have influenced policies, urban planning, and social and public health services.

Abstract: Frequent contact with and exposure to nature and forest environments are shown to have beneficial effects through different pathways on human health and wellbeing. During the past 20 years the research in Finland has focused on urban and peri-urban forests looking at the associations between self-reported and clinical manifestations of health, the accessibility and use of forests, as well as how different users may respond to forest exposure. Moreover, the research has expanded to cover collaboration across outdoor recreation, psychology, environmental health and medical sciences to contribute to the current knowledge base. Natural Resources Institute Finland (Luke) has been a leading national institute to initiate studies and research collaboration focusing on the health benefits of forests. The accumulated scientific knowledge has been increasingly acknowledged in policies, such as the first Finnish Outdoor Recreation Strategy 2030, in urban planning as well as in developing social and public health services. The improved knowledge has also been reflected in the productization of outdoor recreation and nature-based tourism services.

More recently, medical sector has been more actively promoting preventive health care practices through regional public health programs such as the Nature step towards health -program (2022-2032) in PäijätHäme and a long term health program Our Path (Meiän Polku) in Central Finland. In 2024 Luke prepared a large review of the research knowledge available in the Nordic countries together with the Finnish Institute for Health and Welfare targeting high level decision makers in Finland. This study also included economic calculations of monetary values of the avoided health care and societal costs though adequate forest and nature exposure associated with key public health diseases in Finland.

This presentation describes the current status of forests for health - research in Finland and the key actions taken to mainstream forest benefits for public health. These actions include improved understanding of economic implications of forests contributions to human health as well as how improved networking and targeted actions both at research and practice can boost mainstreaming the potential benefits within the society.

Keywords: Public health, Nature-based interventions, Economic valuation, Policy implications

From Theory to Practise in Therapeutic Ornithology: Integrating Birds, Psyche, and Health

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HIGHLIGHTS:

- Birdwatching's therapeutic impact is scientifically proven, enhancing human culture and well-being.
- Workshops show birdwatching improves mood, fosters social ties, and enhances cognitive functions.

Abstract: For millennia, birds have been intertwined with human culture, observed keenly for their beauty and behaviours, with recent decades uncovering their therapeutic potential. This connection took a profound turn during the COVID-19 pandemic, which marked a breakthrough in understanding therapies based on bird observation. Increasing scientific evidence now not only illustrates the breadth of birdwatching's impact but also elucidates its underlying mechanisms. Most studies rely on questionnaire surveys and observational methods, but there is a growing body of work employing more sophisticated approaches. However, we not only provide the theoretical foundations of therapeutic ornithology but also highlight practical methods. Our initial experiences with field trips during the pandemic involved mental health professionals—psychiatrists and psychologists—working under significant pressure. The societal shift towards a more restrictive, "adult" mode of operation curtailed activities that stimulate the imagination, such as travel, theatre, and the arts. Ornithological walks offered a respite from pandemic restrictions, opening a space for playfulness, fantasy, and childhood experiences.

Further advancements were made with healthy participants in eco-therapeutic workshops, revealing that therapeutic ornithology impacts multiple levels. Sensory enhancement through the auditory experience of bird songs, emotional uplift from identifying and watching bird species, cognitive stimulation from the curiosity and desire to learn about birds, and linguistic enrichment from acquiring new vocabulary related to birds and their behaviours all contribute to its effectiveness. The calming and relaxing effects offer immediate mental and physical relief, helping participants shift focus from internal concerns to external stimuli. Therapeutic ornithology not only enhanced participants' moods but also fostered social connections among them, demonstrating its broad and profound efficacy in real-world applications. This integration of nature, mental health, and therapeutic practice illustrates the enduring and evolving relationship between humans and birds, emphasising the restorative power of our natural environment.

Keywords: birds, mindfulness; therapeutic ornithology; mental health



Effects of Forest Therapy on Mental Health and Psychological Wellbeing

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HIGHLIGHTS:

- Research shows that forest therapy can alleviate depression and anxiety
- Participants also report sometimes experiencing deep insights that can have a positive effect on their lives

Abstract: Although not enough research has been done on psychological effects of forest therapy, mainly due to difficulties finding funding, the research that does exist shows that forest therapy can have a positive effect on participants' emotional health and wellbeing. Forest therapy has been found to relieve depressive and anxiety symptoms, to decrease the level of stress hormones in the blood, to improve focus of attention and encourage creativity. Observations from practicing forest therapy also show that often participants report experiencing deep insights into their current life circumstances, emotional needs and difficulties, which help give meaning to their current or past life experiences, thus enabling a deeper connection with oneself and a stronger and more coherent sense of self.

Keywords: mental health, stress, anxiety, meaning making



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How forest therapy supports and increases the effectivity of the 12 step program in addiction rehabilitation

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HIGHLIGHTS:

- The effect of forest therapy on the addiction rehabilitation process
- How forest therapy relates to and supports many of the steps of the AA 12 step program
 used in the Addiction Rehabilitation Center.

Abstract: Addiction is a coping mechanism and a trauma response. Drug abuse over the last decade has increased by 45% worldwide and is becoming a major problem in many countries around the world.

The industry of addiction rehab centers has therefore grown rapidly in many countries as well and only in the US it is worth US\$42 billion dollars each year.

Most addiction rehabilitation centers work with the 12 step program offered and developed by AA in 1935 and based on a religious/spiritual approach.

The Costa Rica treatment Center combines the 12 step program with many other modalities, complementing the 12 step program efficiently and successfully. Forest Therapy is one of these modalities.

How forest therapy supports and increases the effectiveness of the 12 step program in Addiction rehabilitation explores how forest therapy works and relates to many of the steps of this long standing program and makes these steps easier and more approachable for the clients of the center.

The results they have seen in the center after having regular forest therapy walks is a decrease in the levels of anxiety, a greater sense of calmness, but also a better mood and attitude towards the other sessions and meetings offered by the center.

Keywords: addiction rehabilitation; forest nature therapy; anxiety

Forest therapy sciences and practices in Taiwan

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HIGHLIGHTS:

- Forest therapy improves health in the aging population.
- The policy and development of forest therapy in Taiwan.
- Forest therapy contribute to cognitive performance and brain health among middle-aged and senior individuals.

Abstract: Taiwan's rapid population aging and transition into a hyper-aged society call for prioritizing cognitive activity and well-being for successful aging. Forest therapy has emerged as a promising intervention to improve health and well-being in the aging population. This presentation illustrates the policy and development of forest therapy in Taiwan. Moreover, the latest research findings of Taiwan on how forest therapy contributes to health, such as cognitive performance and brain health among middle-aged and senior individuals, are discussed. This research emphasizes the importance of integrating forest therapy interventions into comprehensive strategies aimed at enhancing the well-being of older individuals, with notable implications for cognitive health.

Keywords: successful aging; forest therapy policy in Taiwan; cognitive health

»You are not alone« reduction of feelings of loneliness through relationship with Nature

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HIGHLIGHTS:

Workshop for coaches, psychotherapists, forest guides, laser therapists, anyone whose clients struggle with feelings of loneliness.

Assumptions: Learning to relate to nature can be a powerful tool to reduce feelings of loneliness and build respect for nature.

Abstract: The purpose of the forest therapy session was to find out whether nature can reduce feelings of loneliness, whether a forest therapy session guided by the theme of demonstrating connections with nature can influence feelings of unity and reduce feelings of loneliness.

The method used was Schulz autogenic training and exercises that invited us to look for and discuss connections in the appearance of our skin, our smells, our plant-like behavior. The theme of forest therapy "You are not alone" was carried out with mothers of children with cancer who live in the hospital room on a daily basis, as well as with people staying in the sanatorium. There were different age groups and an Amazonian group (Post mastectomy women). At the end of the meeting, each participant received a poem that spoke about connection, about the disappearance of feelings of loneliness when one is close to nature.

Each participant felt a connection, a rush of communication with someone much deeper and more supportive. The differences were that this feeling came at different stages, depending on the sensitivity of the person and the degree of tension resulting from a life of uncertainty and stress.

The sessions carried out according to the scenario I created show that the feeling of loneliness is significantly reduced when we show our connection, building a relationship with nature and with ourselves at the same time. The feeling of separation disappears, we are less stressed, we have less anxiety, tension, uncertainty, trust in the world and a feeling of peace increases. The conclusion is to learn a relationship with nature which, although it is communal, is also peaceful.

Keywords: nature, forest, loneliness, connection

Nature's Rx: Harnessing the Healing Power of the Great Outdoors for Mental and Physical Wellness

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HIGHLIGHTS:

- Nature therapy enhances well-being even in single sessions, while a course significantly reduces anxiety, depression, improves sleep quality, working speed, and diastolic blood pressure.
- We recommend to incorporate nature therapy into health promotion or restoration programs and encourage independent engagement in nature therapy.

Abstract: Nature therapy is a therapeutic method aimed at developing various aspects of human potential psychological, social, sensory, physical, and spiritual - contributing to wholeness. We aimed to to assess the effects of a newly developed nature therapy procedure on the mental and physical health of individuals experiencing stress. Methodology involved a multicenter randomized controlled single-blind parallel group trial conducted across 6 Lithuanian resort centers in February 2023, where one group received only nature therapy procedures. Forty-three participants with stress levels >3 on a 10-point visual analog scale (VAS) received an 11-day nature therapy regimen developed by researchers. This regimen included a 45-minute nature walk (forest, seaside), simple strength and low-intensity breathing exercises, sensory stimuli (landscape, forest aromatherapy, natural sounds, collecting natural items), mindfulness therapy, and heliotherapy. Results showed a significant reduction in fatigue, pain, and anxiety levels, as well as improvements in mood and overall well-being after each intervention, ranging from 3% to 13%. Although perceived stress and salivary cortisol levels insignificantly decreased after the treatment course, integrative outcomes improved non-significantly, but significant improvements were observed in pain (MD 0.6 (VAS); p=0.004), headache (MD 1 (VAS); p=0.014), state anxiety (by 11.6%, p=0.020), trait anxiety (by 7.2%, p=0.020), physical fatigue (p=0.018), and restlessness (p=0.037). Furthermore, depression decreased across three dimensions: thinking / concentration (31%, p=0.012), suicidal ideation (76%, p=0.033), and loss of interest (49%, p=0.029), while sleep quality (MD 0.7 (VAS), 12%, p=0.013) and working speed (27%, p=0.006) improved up to 6 months post-intervention course. Diastolic blood pressure decreased by 3.4 mmHg post-intervention (p=0.006) and maintained for 3 months, while skin whiteness increased (p=0.048). In conclusion, even single session of nature therapy enhance well-being, while a course significantly reduces anxiety, depression, improves sleep quality, working speed, and diastolic blood pressure. It is recommended to incorporate nature therapy procedures into health promotion or restoration programs and encourage individuals to independently engage in nature therapy.

Keywords: nature therapy; mental disorders; mindfulness; stress.

Detroit Therapy Forest: Fostering environmental and social resilience in a postindustrial city

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HIGHLIGHTS:

- Describes innovative therapy forest project in depopulated district of Detroit, Michigan USA
- Considers forest as a response to urban blight and trauma as well as a source of resilience and a catalyst for revitalization
- Utilizes geographic, ethnographic and biological data

Abstract: This presentation shares insights from the postindustrial American city of Detroit, Michigan USA, focusing on a therapy forest project initiated by a small nongovernmental organization. Based in the north central part of Detroit, the mission of Rescue MI Nature Now (RMNN) "is to acquire underutilized plots of land and revamp them into communal green spaces, populated with trees, flowers, and native flora." In 2022, RMNN received support from National Fish and Wildlife Foundation (NFWF) Southeast Michigan Resilience Fund to transform an area characterized by neighborhood blight into an approximately 2-acre, accessible therapeutic forest through a participatory planning design and construction process that also provides a hands-on learning component for students. We provide background on the ecology and history of Detroit and we document the first two years of this project, through the summer of 2024. We include geographic and ethnographic data on the community context as well as lists of species and forest design. Based on pilot data to be gathered in partnership with faculty and students from the University of Michigan-Dearborn, we consider the following questions: Can small scale "pocket forests" that are intentionally designed achieve similar restorative goals as larger forests that are naturally occurring? How can a forest alter or reverse the relationship between human residents and wild growth, shifting from perceptions of threat to benefit? Finally, how does the development of this localized forest add to other efforts to revitalize distressed urban neighborhoods?

Keywords: urban; therapy; resilience

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Using the INFTA* methodology to create a Nature Therapy trail in a protected territory: a case study

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HIGHLIGHTS:

- Nature Therapy is rapidly becoming popular in Lithuania, so the need for creating Nature Therapy trails is increasing
- The first Nature Therapy Trail in Lithuania created according to the INFTA methodology (one of possible methodologies for creation of Nature Therapy Trails)

Abstract: The first Nature Therapy Trail in Lithuania, created according to the INFTA methodology located in Girionys Park in the territory of Kaunas District. This area is a part of the Kaunas Lagoon Regional Park. Location was chosen due to favourable geographical conditions, demographic factors, unique natural conditions (various land surface conformations, geological diversity, different soils, water bodies, variety of grassy and woody cover, medicinal and edible plants, abundance of birds and mammals), safety criteria - all of this fully meets the main INFTA requirements for the creation of Nature Therapy trails.

In the area, you can find stands of various ages, dominated by conifers emitting large amounts of phytoncides, which is a very important factor that ensures the successful conduct of a Nature Therapy session. There are 9 plant species from Lithuanian Red Data Book in the territory.

Expediency of establishing a trail in this area is also substantiated by the results of the SWOT analysis, which was conducted before the trail was created.

Maps of sounds, images, and smells have been created, and based on them, characteristic places have been chosen for the stimulation of human senses. There are nine activity spots on the trail, the last of which is a Tea Ceremony spot.

Before starting to use this trail for commercial Nature Therapy group sessions, pilot sessions were conducted with volunteers who were asked to complete questionnaires after the sessions. Obtained results were analysed, the structured material was submitted to INFTA (Australia).

*INTERNATIONAL NATURE AND FOREST THERAPY ALLIANCE

Keywords: nature therapy trail 1; INFTA methodological requirements 2; sound map

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The infinitely small are infinitely great: Forests, microbes and human health

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HIGHLIGHTS:

- Environmental microbes (including those in forests) are vital for training and regulating our immune systems.
- They also play a role in shaping our moods and behaviours via the gut-brain axis.
- Restoring our ecosystems restores our health.

Abstract: As Immunologist Tari Haahtela said, "We are protected by two nested layers of biodiversity: the microorganisms of the outer layer [in nature] and the microorganisms of the inner layer, our gut, skin and airways". Recent research has illuminated the pivotal role that environmental microbes (e.g., bacteria, fungi, viruses) play in training and regulating our immune system and promoting overall health. Forests, rich in microbial diversity, offer an underappreciated reservoir of 'invisible friends' that interact with the human body in complex and beneficial ways. Exposure to a diverse array of microorganisms helps prevent the development of allergies, autoimmune diseases, and other inflammatory conditions. Moreover, growing evidence suggests that microbes influence mood and behaviour via a bidirectional communication system linking the gastrointestinal tract to the central nervous system. Forests, with their diverse microbial populations, provide an excellent context for beneficial exposures. Studies have shown that spending time in forest environments can lead to improved immune function, reduced stress levels, and enhanced mental wellbeing. This occurs through a multisensory experience but also via biological pathways that transcend our perceptions. This talk explores the mechanisms by which environmental microbes influence human health - both physical and mental. I will discuss how these microbes modulate immune responses and contribute to the production of anti-inflammatory compounds and chemicals that talk to the brain. By understanding the relationships between forest microbes and human health, we can better appreciate the importance of conserving and restoring natural environments and integrating (the rest of) nature into our daily lives.

Keywords: microbiome; forest bathing; gut-brain axis

Nature Environments Fostering Leadership Skills

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HIGHLIGHTS:

- Nature and equine-assisted training are perceived as relaxing and empowering
- Nature and equine-assisted training effectively support the development of self-leadership skills, leading to improved well-being.

Abstract: Currently, working environments have diversified as work is done in many locations; summerhouses, home offices, nature. This has changed the role of leaders, and more emphasis is laid on leadership skills. Sustainable leadership suggests several practices, including self-leadership- to support the well-being of leaders. Strengthening leaders' self-leadership skills benefits the whole work community's well-being. Although leadership development trainings are widely studied, evidence of their effectiveness remains scarce. This study explores how nature as a learning environment can enhance self-leadership skills. These environments are known for decreasing stress, improving concentration, fostering affective trust within teams, emotional intelligence, and self-leadership.

Our study aimed to pilot sustainable leadership training to foster self-leadership through nature environments and equine-assisted practices. Two training pilots were conducted in spring 2023, involving 19 Finnish leaders. Research data was collected through surveys implemented before and after the training. The surveys measured participants' self-leadership skills and experiences of learning environments. Participants reflected on their development by diary and smart-ring data. Co-creation workshop data was used to complement the dataset.

Altogether 19 (n=19) participants were enrolled in the training program. As a result, participants reported increased self-leadership skills. Nature as a training environment was experienced as relaxing and empowering. Additionally, mindfulness and emotional skills training with horses was a powerful experience. Stress measures were used for self-reflection, and the results reinforced self-awareness. We conclude that nature and equine-assisted training support the development of self-leadership skills leading to improved well-being.

Keywords: nature; wellbeing; self-leadership training

Forests and Urban Green Spaces as a Comprehensive Framework for Enhancing Holistic Health and Promoting Sustainable Wellbeing

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HIGHLIGHTS:

- Wellbeing based on one-health principle leads to the interdisciplinary analysis and expansion of the term towards the paradigm of sustainability;
- Green spaces, urban or natural ones, play a crucial role for the communities to restore the connection with nature, as the accelerator for responsibility of planetary wellbeing;
- Forests express the model of stability and permanent changes; variety and complexity; ecosystem services and lessons how to understand the ecosystems and the role of humans within it;
- Education and awareness raising in the field of sustainable wellbeing is being effective when combining the theories and science-based knowledges with the practical skills and experiences.

Abstract: The most common understanding of the wellbeing is based on the personal quality of life expressed as the state of feeling healthy and happy. However, it is closely related to self-sufficiency and consumerism, oriented to the egocentric approach. That is opposite to the paradigm of sustainability which is oriented to the long-lasting ability and responsibility to live in a healthy environment. Meanwhile the World Health Organization (WHO) determine well-being as the expression of the quality of life and the personal, community abilities to contribute to the world with a sense of meaning and purpose. The interlinkage of social, environmental, cultural and technological issues increases the complexity of the topic, but it leads to the holistic approach towards sustainable wellbeing, based on one health principle and systematic approach. This presentation describes the urban green spaces and forests as the comprehensive framework for creating healthier and more sustainable communities. The results of the research of multifunctional urban green spaces are based on the multicriteria analysis, analysis of ecosystem services and life cycle approach. It visualizes how the integrity of different aspects helps to create the green spaces according to the needs of local communities and having the ability to increase the resilience to global challenges.

The forests and other natural ecosystems and it's impact to sustainable wellbeing have been started to be analysed in the <u>SWEPPP</u> project with the main goal to develop the education material on the topic of Planetary wellbeing as one of the core pillars of sustainable wellbeing paradigm. The outcomes show that the personal and planetary wellbeing are not contradictive ones, but complementing each other as the expression of human responsibility towards sustainability and long lasting well-being.

Keywords: sustainable wellbeing; one health; green spaces; forest

Göttweig Healing Forest: A Best Practice Model for Health and Tourism Integration

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HIGHLIGHTS:

- Göttweig Healing Forest Model exemplifies the integration of health and tourism to boost regional development.
- The project enhances the region's attractiveness and offers a unique health experience.
- It aligns with SDGs, promoting sustainable tourism, health infrastructure, and international collaboration.

Abstract: The Göttweig Healing Forest, Austria's first certified healing forest spanning 53 hectares, stands as a best practice model for integrating health and tourism development. Initiated as a project by Stift Göttweig in collaboration with the IMC Krems, this innovative project is planning to leverage the natural environment to enhance physical and mental well-being while significantly boosting regional tourism.

This presentation will provide an in-depth analysis of the Göttweig Healing Forest, detailing its conceptualization, development, and planned implementation. The project focuses on building infrastructure, creating therapeutic services, and utilizing resource-efficient practices, guided by best practices. This initiative will attract tourists and foster sustainable economic development.

The Göttweig Healing Forest aligns with several United Nations Sustainable Development Goals (SDGs), notably SDG 3 (Good Health and Well-being) by offering accessible natural therapies, SDG 8 (Decent Work and Economic Growth) through the promotion of sustainable tourism, and SDG 17 (Partnerships for the Goals) by facilitating international collaborations and knowledge exchange.

The presentation will showcase the best practices identified in the Göttweig Healing Forest project, demonstrating its potential as a replicable model for other regions seeking to integrate natural environments into health and tourism strategies. Insights from this project highlight the importance of interdisciplinary approaches in achieving sustainable health and economic outcomes.

Keywords: Healing Forest, Sustainable Tourism, Health, Regional Development, Göttweig, SDGs

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From Healing Forests to a One Health Region: A transformation concept for Western Pomerania

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HIGHLIGHTS:

- The concept of the healing forest was further developed and implemented in Mecklenburg-Western Pomerania
- Western Pomerania is now on its way to becoming a One Health Region

Abstract: The healing forest concept, which was fundamentally further developed in Mecklenburg-Western Pomerania (MWP) including an international certification process, is well established and increasingly evidence-based. Germany and Europe are more and more catching up with Asia in terms of demonstrating and applying the scientifically proven positive effects of time spent in nature on human health and overall wellbeing. Several healing forests have already been established in MWP, and internationally they are being certified on the basis of a methodology established in MWP. Healing forests can be contextualized as one modern showcase of the continuing regional endeavor to enhance One Health interactions between disciplines in MWP.

Based on the integrated One Health approach recognizing the positive effects of healthy and health promoting nature for humans, an initiative has now been developed by five scientific institutions in MWP. It aims at establishing the world's first One Health Region that sustainably balances and optimizes the health of humans, animals, and ecosystems as being closely linked and interdependent. The initiative's final target is »One Health mainstreaming, i.e., the health of humans, animals and ecosystems in their interdependencies should be reflected in all political, legal, social, economic and medical decisions in the region. Thus, the One Health Region affects environmental planning for public health and health policies, among other things, and poses the question of the impact on human, animal and environmental health across all measures. Beyond this paradigm shift, other focal points include the reduction of infections and antimicrobial resistance, as well as the creation and maintenance of a healthy and health-promoting environment. The initiative mobilizes multiple sectors, disciplines, and communities at varying levels of society to work together to foster well-being and tackle threats to health and ecosystems, while addressing the collective need for healthy food, water, soil, and air, taking action on climate change and contributing to sustainable development. Since 2023, the German Federal Ministry of Research and Education (BMBF) is funding the implementation of this concept in Western Pomerania for 9 years with up to 18 million euros. The initiative itself and the initial experiences will be presented, demonstrating the immense potential of the healing forest concept for an overarching, health-centered regional transformation.

Keywords: Healing Forest; One Health Region; Regional Transformation

The expected benefits of establishing a healing forest: Druskininkai forest study

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HIGHLIGHTS:

- Significant impact for local economy growth established healing forest promotes sustainable local businesses and new jobs in the surrounding area.
- Resort season (according to existing examples) can be extended from short summer season to all year round.
- Healing forest establishment can also serve as the way of protection of high value natural forest massifs from their loss (caused by harvesting)
- Druskininkai is an example of a resort situated in valuable natural forest containing near 50% of EU importance forest habitats

Abstract:

Existing examples increasingly proves that establishment of a healing forest positively affects local communities by giving new jobs perspectives, influences growth of local sustainable businesses (lodging, dining, rural tourism, etc.). According to the fact that over the past 2 decades reckless logging of valuable forests has spread through Europe due to unprecedented timber demand, official healing forest status can also serve as a protection for most valuable forest massifs. An established healing forest can bring many benefits to the resort bordering it. The resort season can go from a brief summer activity to a year-round influx to visitors. The resort's revenue, which has grown sharply from increased visitor flows, can cover the cost of all the timber in the healing forest within the first few years. Such a sustainable way of using the forest is incomparably more valuable than using it for timber harvesting (when the valuable properties of the natural forest are essentially lost). A realized example of this type is the Heringsdorf resort in Germany. The Druskininkai resort has an even greater potential of the natural forests surrounding it and meets all the necessary criteria according to the Catalogue of criteria for the development of a healing forest (ICO-nd-002-en-v1:2022, International Certification office Healing Forest at BioCon Valley GmbH). The Druskininkai Healing forest feasibility study can be useful for other resorts seeking to identify the possibilities of establishing a healing forest in their territory. There are two large massifs of natural origin forest on the territory of the resort, which contains more than 50% of EU Importance forest habitats (9010 Western Taiga, 91TO Central European lichen Scots pine forests). These forest areas contain various terrain, water bodies (streams, ponds, bordering with large rivers), no noise or air pollution, high level of terpenes, forest remain unmanaged. Exactly 100 years ago the first forest treatment park was established in the southern part of the resort, still existing in our days. The resort Municipality also prefers the reorientation of the remaining valuable forests to alternative therapeutic use by refusing any timber harvesting. 6-th International ISFT congress is planned to take part in this area.

Keywords: healing forest establishment; alternative forest economy; resort

Regenerating People and Planet – an intersection of tourism and nature connection practices

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HIGHLIGHTS:

- The overarching benefits of nature and forest therapy in responsible tourism and destination development
- An emerging well-being trend connecting people and planet while visiting and exploring outdoor places

Abstract:

Health-supportive forest therapy and nature connection activities can inspire transformational tourism. As societies worldwide grapple with mental and physical health issues on one side and environmental crisis on the other side, the increasing detachment from nature and demand for easy-to-access, fast-paced experiences—spanning daily behaviors to travel decisions—has led to unhealthy, unsustainable choices. Nature-based wellness practices align with regenerative tourism principles by promoting individual and environmental health, holistic well-being for all living beings, and sustainable relationships between people and nature. Integrating these practices into how travelers experience destinations can transform tourism, advocating for sustainable travel models.

My work explores the impact of forest and nature therapy on tourism development by synthesizing studies on the health benefits of nature therapy and consulting regenerative tourism practices. The findings highlight the relational benefits of conscious interactions with nature and their potential to foster low-impact, long-term sustainable travel experiences. These experiences yield social and economic benefits for travelers, host communities, and the broader circle of tourism and well-being stakeholders. The review examine the intersection of scientifically validated health benefits, a growing global trend in self-care and well-being, and the regenerative power of nature-based, health-oriented tourism. The work supports a paradigm shift towards alternative, sustainable travel models that nurture both individuals and the planet.

Keywords: forest therapy, regenerative tourism, mental and physical health, social and economic impact

The right to work in the case of forest therapy: legal perspective

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 - ** This project has received funding from the Research Council of Lithuania (LMTLT), agreement No. P-PD-23-208 "Realisation of the right to work in the case of nature therapy".

HIGHLIGHTS:

- The legal definition and conception of forest therapy is crucial for the identification of legal relationships and the regulatory regime applicable to them.
- The different mechanisms for regulating forest therapy as a professional activity and the legal environment in the different Member States of the European Union affect directly the freedom of establishment, freedom to provide services and free movement of workers especially in non-wood forest economy and public health sectors.

Abstract

Global challenges (economic recession, social polarization, humanitarian and public health emergencies, information technological progress, the climate crisis, the wars) are affecting contemporary labor market, public behavior and, in the field of public health, are leading to new needs in the management of the situation of the increasing number of specific ailments (emotional, mental and physicalexhaustion, burnout and related illnesses) due to the above mentioned causes. In 2022, the World Health Organisation (WHO) identified global mental health threats as key structural factors that could slow global progress towards greater well-being and undermine the health of many people. A European Parliament resolution calls for urgent new approaches and solutions to improve public health. The WHO supports and recognises the benefits of using nature-based practices for public health. The changing regulatory environment of nature-based services or self-regulation show that the issue is important in Lithuania and other countries, and that it touches on the sensitive areas of public health, the free movement of workers, the freedom of establishment, and the freedom to provide services. Therefore, the aim of this presentation is to introduce the research project results and main findings on regulatory environment of forest therapy (legal concept of forest therapy, licensing, qualification and responsibility requirements for the forest therapists and guides, other conditions) as well as to present more detailed and further-reaching legal approach to current regulatory situation, challenges in Lithuania and other European Union countries.

Keywords: Forest Therapy; Nature Therapy; Legal Regulation; Forest Therapist; Forest Guide, Freedom of Establishment; Freedom to Provide Services; Movement of Workers; Forest Therapy Licensing

The Importance of Forest Bathing for Businesses

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HIGHLIGHTS:

- Enhanced Environmental Values and Priorities: Forest bathing transforms corporate leaders and employees by deepening their appreciation for nature, leading to a profound shift in environmental values and priorities.
- Sustainable Business Practices: Integrating forest bathing into corporate culture promotes well-being and creativity, driving businesses to adopt sustainable practices, invest in green technologies, and support conservation initiatives, thereby addressing the climate crisis effectively.

Abstract: The corporate world needs to establish a heart connection with nature which arises through forest bathing to address the climate crisis caused by low biodiversity and climate warming. Forest bathing involves immersing oneself in a forest environment to engage the senses and foster a deep, personal connection with nature. This practice can transform the relationship which corporate leaders and employees have with Nature by enhancing their appreciation of the natural world, leading to a profound shift in environmental values and priorities. As individuals experience the rejuvenating and stress-reducing effects of nature, they become more attuned to the importance of preserving biodiversity and mitigating climate change. This heightened awareness can drive businesses to adopt more sustainable practices, invest in green technologies, and support conservation initiatives. By integrating the principles of forest bathing into corporate culture, companies can inspire a collective commitment to environmental stewardship. This connection not only promotes wellbeing and creativity within the workforce but also aligns corporate strategies with ecological sustainability. Forest bathing can catalyze a paradigm shift in the corporate world, encouraging actions that contribute to solving the climate crisis and ensuring a healthier planet for future generations.

Keywords: Forest bathing; Relationships; Sustainability

Mindfulness and Forest Therapy: Commonalities, Differences and Possibilities

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HIGHLIGHTS:

- Mindfulness and Forest Therapy synergy could be a cost-effective intervention to improve mental and physical health

Abstract: Mindfulness and Forest therapy (FT) are potentially beneficial to improve mental health . *The purpose* of this presentation is to provide translational and pragmatic approach to understand mindfulness in the context of FT and to share practical aspects of mindfulness application in the context of FT and possible FT enrichment by mindfulness practices.

The background of mindfulness and FT practice will be discussed and the emotional, neuroendocrine, and neurobiological responses according recent literature will be presented. Mindfulness research has been substantially increasing as an intervention to improve general health and well-being (1) as well as FT over the past decades gain evidence on beneficial effects for both, physiological ans psychological health (2). During uncertain times, including treat of the war, war, COVID-19, synergy of mindfulness with FT may be specifically important to at-risk groups, those experiencing depression and anxiety, and at-risk populations such as students, veterans, and professionals with high levels of stress, as well as patients with chronic conditions, such as coronary artery and lung disease. Possible practical recommendations for selected groups will be presented.

Literature:

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- 2. Li Q. Effects of forest environment (Shinrin-yoku/Forest bathing) on health promotion and disease prevention -the Establishment of "Forest Medicine". Environ Health Prev Med. 2022;27:43.

Keywords: mindfulness, forest therapy, synergy;

From Digital Detox to Green Transition: Incorporating Forest Therapy into Our Triple Transformation Approach

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HIGHLIGHTS:

- Triple Transformation Approach: Integrating green, digital, and social/cultural transition elements for sustainability.
- Emphasis on Cultural and Social Shift: Promoting mindset and behavior changes toward sustainability.

Abstract: At the Steinbeis School of Sustainable Innovation and Transformation (Steinbeis-SIT), we adopt a triple transformation approach to address the sustainability challenges. Our educational programs and projects emphasize integrating green, digital, and social/cultural transition elements to create a comprehensive strategy for building sustainable economic practices and resilient societies. This presentation will delve into our holistic triple transformation approach, especially relevant considering recent regulatory frameworks on sustainable economic activities. We will highlight the critical importance of coupling green and digital transition processes and strategies. Equally crucial, yet often overlooked, is the cultural and social shift in mindsets and behaviours towards sustainable practices. Using forest therapy as an illustrative example, we will explore the implications of the triple transformation approach. While digital technologies are indispensable in our lives and contribute significantly to sustainable transformation, it is crucial to use these technologies healthily and maintain our personal and professional well-being. This presentation will provide insights into digital detox through forest therapy, which encourages disconnecting from digital devices and reconnecting with nature. Digital detox not only enhances well-being but also fosters a deeper appreciation for the environment. By sharing insights from our project on sustainable well-being, SWEPPP, we will underline the mantra, "responsibility starts with oneself." This concept highlights how promoting the importance of forests and forest therapy in our well-being can inspire a readiness and willingness to engage with nature and adopt sustainable practices for its preservation at both individual and professional levels.

Keywords: triple transformation; sustainable well-being; digital detox

Tailor-made forest therapy: scenarios for various groups in practice of the Polish Forest Bathing Association

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HIGHLIGHTS:

- Tailor-made scenarios of forest therapy (FT) dedicated to different clients and patients groups can significantly improve the cooperation between FT guides, health institutions, companies and Nature
- Sharing different FT scenarios among Polish Forest Bathing Association guides supports the competences of FT professionals, regardless the FT school or model
- Forest therapy scenarios can support the well-being of different companies employees and strengthen the sustainable development in business

Abstract: Forest therapy is not only a preventive form of health-promoting service, it is also useful in supporting the clinical treatment of various diseases and in the rehabilitation process. At the Polish Forest Bathing Association, a non government organization bringing together forest bathing and forest therapy guides from all over the country, we have developed 20 different forest bathing and forest therapy scenarios for the purposes of working with groups with specific health and social requirements and in specific field conditions. Our scenarios are based not only on scientific research but also on large field experience of practice of guides who work with different group of patients in cooperation with hospitals, clinics and health supporting fundations. We believe that scenarios tailored to the limitations and needs of different groups of clients (with mental health issues, seniors, different disabilities and somatic disorders etc.) and sometimes difficult field circumstances (like at night, in the garden, in isolation) can significantly improve the process of supporting recovery in partnership with Nature, and also constitute a valuable tool supporting the competences of forest therapy guides of various schools and trends. Our goal is also to prevent occupational burnout and to take care of the well-being of company employees in accordance with the principles of sustainable development. In this presentation, we introduce the main assumptions of these scenarios, outlining the need to tailor ecotherapeutic services to dedicated groups of recipients.

Keywords: forest therapy; scenarios; mental health; sustainable development; disabilities

"Nature on Prescription"

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HIGHLIGHTS:

- Significantly improves participants' mental health, well-being, and employability.
- Can be adapted to target specific populations, such as vulnerable young individuals.

Abstract:

Nature on Prescription is an extension of the national project "Culture on Prescription," which the Municipality of Silkeborg implemented from 2016 to 2019. Since 2020, "Nature on Prescription" has been a municipally funded initiative aimed at strengthening mental health and well-being and enhancing employability for citizens affected by mild to moderate stress, anxiety and/or depression. Participation in the program is free of charge.

Objectives: Strengthen participants' mental health and well-being; Increase participants' readiness for employment or education; Introduce participants to Silkeborg's outdoor facilities and possibilities, and demonstrate how nature and outdoor experiences can enhance their quality of life beyond the program. Nature on Prescription is a rehabilitative program for sick-listed and unemployed citizens in the Municipality of Silkeborg, who experience mild to moderate stress, anxiety, or depression.

Nature on Prescription consists of a 9-week program with a maximum of 15 participants per group. There are planned two weekly sessions lasting 2 hours each. The program collaborates with local externa partners to offer various outdoor activities, including coffee made on bonfire, quiet walks, foraging trips, lake sailing, and light outdoor training at different locations, with different professional communicators.

Selected results [2023 data - subject to updates by September 2024]: The courses have been evaluated using pre- and post-questionnaires for participants in all project years, along with qualitative evaluations.

- 83% of participants reported that the program significantly or somewhat increased their mental health and well-being.
- Only 6% felt unprepared for the labour market after the program, compared to 47% before.
- 71% were highly inspired to use nature actively after the program.

The program significantly improves participants' health, well-being, and employability. Due to its success, a similar program targeting vulnerable young individuals on the cusp of employment or education will be launched autumn 2024.

Keywords: nature based therapy, mental health, employability

New approach in primary health-care - the design of health-promoting outdoor environments in nature-based treatment for vulnerable populations

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HIGHLIGHTS:

- An evidence-based quality assurance system is needed to ensure high standards in nature-based treatments in forests.

Abstract:

In 2014, the healthcare authorities in Region Skåne, Sweden, successfully implemented nature-based rehabilitation (NBR) as a part of primary healthcare. Since then, three official procurements have been conducted. The procurement covers various aspects expected to be delivered by the NBR providers. One particular aspect is the requirements of the outdoor environment in which the NBR is conducted. This is regulated by an evidence-based quality assurance standard. Despite a comprehensive standard regarding the quality of the outdoor setting, there is no mention of the requirements regarding the forest or forest sites used in the NBR interventions. Through research and international collaboration, these requirements are now being forged and tested in several national and international studies. New forest bathing and therapy standards for forest sites, will be incorporated into the coming procurement in Region Skåne.

Keywords: Nature-based health care; Evidence-based health design; stress reduction.

What do people living with cancer think about Forest bathing? A content analysis.

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HIGHLIGHTS:

- Studies investigating the effects of multiple Forest Bathing sessions on people living with cancer are almost incredibly scarce.
- This study aims to explore initial expectations, value-drivers, and the way in which people living with cancer self-perceive the effects of FB sessions.
- expectations of results obtainable from experiencing FB sessions may be generally absent or even low, in people living with cancer.
- results obtained could further facilitate the patients' recruitment process, as well as improve research design and sharpen FB sequences.

Abstract:

People living with cancer have been defined as those that have no signs of cancer after finishing treatments, have signs of an advanced cancer, or are receiving extended treatments over a long period of time. Studies investigating the effects of multiple Forest Bathing (FB) sessions on people living with cancer are almost incredibly scarce. The main purpose of this study is to explore initial expectations, potential value-drivers, and the way in which people living with cancer self-perceive the effects of FB sessions. A pilot-study has been approved by the Ethical Review Authority of the autonomous Region of Friuli Venezia Giulia on 27.09.2022 [CEUR-2022-Sper-102.]. Fifteen people with cancer provided their informed consent and experienced three FB sessions in 2023 in the North-eastern Alps, Italy. Then, they self-described their experiences at the end of the third session. Those descriptions were analyzed by adopting Content Analysis (CA) as a research-method. The high frequency of words including 'skepticism' and its synonyms, which has been enlightened at the beginning of those descriptions, suggests that expectations of results obtainable from experiencing FB sessions could be low. Words such as 'silence' and its synonyms were frequently used. This could suggest the high importance of filtering negative emotions deriving from FB sessions. The use of words as 'surprise', 'gratitude' and their synonyms suggests the self-perceived positive effects of FB sessions. This study claims for further, quantitative, research. Despite this limit, results obtained by this study could support the continuous improvement of research methods, tools and capabilities.

Keywords: cancer; capabilities; forests; forest ecosystem services; forest bathing; forest therapy

The use of hospitals' health forests in Finland

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HIGHLIGHTS:

- Health forests in Finland have been designed and established next to central hospitals in a few cities.
- This study investigates the utilization of health forests by hospital personnel in the well-being service counties of Kainuu and Päijät-Häme in Finland.

Abstract: The Finnish operating model for the health forest began to be developed in a project funded by the Ministry of Agriculture and Forestry in 2014. The project developed health-supporting nature visits for customers of the health centre. Since then, health forests in Finland have been designed and established in the immediate vicinity of central hospitals, as has been done in the cities of Kajaani, Lahti and Kouvola. In addition to professionals and patients, the health forests of hospitals are intended for the free use of residents. Health forests are also well suited as learning environments for schools and kindergartens. However, there is currently no research data on the use of health forests in hospitals.

This study investigates the utilization of health forests by hospital personnel in the well-being service counties of Kainuu and Päijät-Häme in Finland. The survey was sent to personnel in well-being service counties (n=11 600) in June 2024. Answers are expected especially from those working in central hospitals, for whom it is easiest to utilise the health forest in terms of location. The survey includes questions about the employee's background and whether one has utilized the nearby health forest at the work with the clients. In addition, it will be examined what kind of well-being effects the employee has observed on their customers in the health forest and what factors promote or prevent the utilisation of the health forest. The results will be analysed in August 2024.

The study is part of the project 'Nature Prescription - introduction of nature-based methods in municipalities', which is funded by the Finnish Ministry of Social Affairs and Health in 2024–2026. The project is carried out by the Natural Resources Institute Finland. The pilot cities and co-financiers are Kajaani and Lahti.

Keywords: health forest, hospital, nature-based health service

Health Potential of Estonian Forests – testing Shinrin-Yoku methods

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HIGHLIGHTS:

- Participants who took part in the experiment reported increased levels of positive emotions after spending time in the forest compared with spending time in an urban area
- Forests close to the city can be promoted specifically for offering mental health benefits

Abstract: Estonia is a country with around 50% land cover of forests and while many are managed primarily for timber production, there are also significant areas offering recreational possibilities. Estonians have a deep affinity for nature and many people forage for mushrooms and berries as part of their engagement with nature. While the concept and practice of forest bathing, od Shinrin Yoku, has been examined and tested in Finland, this has never been explored experimentally in Estonia. This paper described a pilot-testing experiment in Estonia. The study was conducted as a comparison where 29 participants were asked to complete a short survey on their mental state according to eight dimensions before and after spending time in the city center of Tartu and the nearby Ilmatsalu forest. Data collected during the research was compared between different environmental conditions. The results obtained through analysis showed a positive improvement in mood and a reduction in levels of stress following the forest experience and all results were statistically significant. While the sample size was modest, as a pilot test the results provide insights into how the environment affects people's well-being and what the potential of Shinrin-Yoku methods might be for stress reduction and enhancing mental well-being in the Estonian context.

Keywords: Shinrin Yoku; mental wellbeing; stress recovery

Urban forests and deadwood as indicators of beneficial environment for human health

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HIGHLIGHTS:

- Deadwood in nearby forest of home yards is associated with human health-associated microbiota and pro-inflammatory signals
- Decaying deadwood is important for planetary health including environmental and human health

Abstract: Urban dwellers often have low access to forests. We did vegetation and deadwood inventories around urban homes, collected skin and saliva samples and used satellite data to determine the effect of deadwood-containing forests on human microbiota and immune regulation.

Deadwood around homes was associated directly with beta diversity of skin microbiota, and previously health-associated Gammaproteobacterial taxonomies. Deadwood was directly associated with the diversity of functional gene pathways, which in turn was negatively associated with proinflammatory signals.

We conclude that urban forests and deadwood can be used as an indicator of a beneficial environment for human health.

Keywords: deadwood; microbiota; planetary health; rewilding

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Forest Bathing Experience and Its Relation to Biophysical Characteristics of Forests

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HIGHLIGHTS:

- The research presents the perceptions of forest bathing participants.
- The survey was conducted in four different forests.
- The forest bathing experience and perception depend on forest characteristics.
- The results inform forest management and conservation strategies.

Abstract: Nature therapy, as a recreational activity, plays a crucial role in enhancing human well-being by reducing stress, improving mood, and promoting physical health. As urbanization increases, natural spaces become essential retreats for mental and emotional relaxation. These natural spaces can be within city limits or outside, ranging from small and young patches of forest to large and old-growth forests. The question remains as to how the experience of nature therapy is perceived depending on forest characteristics—such as age, type, location, and size. Moreover, do specific characteristics of a forest enhance feelings of relaxation and mental recovery? Thus, this research seeks to identify and explore the dependence of forest recreation on forest characteristics.

Empirical research of this work presents the results of the survey developed and implemented in spring and summer 2024. The survey seeks to identify the experiences and perceptions of participants in one of the nature therapies known as forest bathing (or Shinrin-yoku). Each forest bathing activity lasted for three hours and had a specific structure, during which all of the senses—sight, hearing, taste, smell, and touch—were used to experience and connect with nature. All activities were conducted in four different forest types, two of which were located in urban environments and two in natural areas. These included an urban park, an urban forest, a natural forest, and an old-growth forest. A statistical analysis was then conducted to identify the correlation between the survey results and the characteristics of the four different forests, including their location, size, age, type, and prevailing species. Weather conditions, time, and some demographic characteristics of the respondents were also analyzed.

The findings of this research inform forest management and conservation strategies, ensuring that forests are maintained in ways that optimize their recreational and therapeutic potential. Furthermore, it highlights the intricate relationship between forest ecosystems and human interactions, emphasizing the need for sustainable practices.

Keywords: recreation; forest type; urban forest; perception; forest bathing.

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Exploring Phytochemical Profiles in Coniferous Swamp Forests: Ericaceae Plants as a Source for Medicinal Uses

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HIGHLIGHTS:

- Evergreen Ericaceae species rich source of phytochemical compounds
- Bioactive components are eligible for the production of functional food and pharmaceuticals.

Abstract: Coniferous swamp forests are interesting ecosystems that host unique plant species with significant medicinal potential contributing to ecological, health and pharmaceutical discoveries. Their combination of wetland and forest environments supports a rich variety of plant species, many of which are not found in other habitats. This study investigates the phytochemical richness of Calluna vulgaris, Vaccinium vitis-idaea, Rhododendron tomentosum, and Vaccinium oxycoccus, focusing on their phenolic and triterpenic profiles to highlight their medicinal potential. These Ericaceae species, characteristic of coniferous swamp forests, are known for their diverse ethnopharmacological properties, which can be targeted to various health and wellness products. Validated UPLC/HPLC-PDA methods and spectrophotometric assays were employed to obtain a comprehensive phytochemical and antioxidant profile of tested selected plant materials. Evergreen Ericaceae plants play a crucial role in forest ecosystems by providing year-round foliage, supporting wildlife, and contributing to the forest floor. They grow in nutrient-poor soil and possess exceptional phenolic and triterpenic profiles with notable antioxidant properties. The study highlights the importance of conserving and understanding the phytochemical variations in Ericaceae species, revealing chemophenetic characteristics. Furthermore, the phenolic and triterpenic profiles of selected Ericaceae plants contribute to their medicinal value, which has a great potential to produce pharmaceutical, cosmeceutical, nutraceutical and wellness products.

Keywords: coniferous swamp forest; phenolic; triterpenic, antioxidant.

Unlocking Nature's Pharmacy: Isolating Novel Pharmaceuticals from Plants and Forests

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HIGHLIGHTS:

- **Innovative Extraction Techniques**: Highlighting advanced methods for efficiently isolating bioactive compounds from plants.
- **Successful Plant-Derived Drugs**: Showcasing examples of effective pharmaceuticals developed from plant sources.
- **Future Potential and Conservation**: Emphasizing the untapped drug discovery potential in forests and the importance of biodiversity conservation

Abstract: Natural habitats, especially the rich biodiversity found in forests around the world, hold vast potential for the discovery of new pharmaceuticals. This talk explores the various techniques used to isolate bioactive compounds from plants, emphasizing methods that maximize efficiency and sustainability. Furthermore, specific examples of potent drugs (antibiotics, anticancer drugs, analgesic compounds and others) will be presented which have been isolated from plant material. These examples will also outline how natural structural features are modified to further improve on the healing potential of phytopharmaceuticals. Overall, emphasis is laid on the critical role of plant-based compounds in modern healthcare.

Moreover, this presentation will look toward the future, examining the immense, yet largely untapped, potential of forest biodiversity for drug discovery. By protecting and studying these ecosystems, we can uncover new therapeutic agents that may address some of the most pressing health challenges of our time.

Keywords: Phytopharmaceuticals; drug-discovery; natural products; bioactive compounds; terpenes; alkaloids

The profound learning experiences for children through forest therapy

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HIGHLIGHTS:

- Forest therapy events conducted over six years demonstrated their potential to stimulate enjoyment, comfort, and cooperative behavior in children.
- To examine how forest therapy impacts children, we need to develop evaluation methods, including health checkups.

Abstract: The Japanese Guidelines for Kindergarten Education recommend that children should be fully physically active in a variety of outdoor activities, that they should be exposed to nature and develop an interest in its beauty and mechanisms, that they should be aware of seasonal changes, and that they should recognize and cherish the preciousness of life in the plants and animals around them. Although forest environments are increasingly being used for this purpose, there are still few published reports on the effects of forest activities due to the difficulty of subjective and objective evaluation by children.

We have conducted forest therapy experience events for 258 children over a six-year period from 2014 to 2019. These activities are subsidized by the 'National Fund for Forest Greenery and Waters' which is under the auspices of the 'National Land Afforestation Promotion Organization'. We showed that forest therapy for children has the potential to elicit feelings of enjoyment and comfort and spontaneous and cooperative behavior in children. Although the health effects of the event were considered inaccurate due to the lack of measuring equipment for children, it was significant in terms of creating opportunities for children to become aware of their health and to experience how health checkups are conducted.

Keywords: Forest therapy; Children; Health checkup

Urban rewilding, microbiota and immune response in intervention trials

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HIGHLIGHTS:

- Urban rewilding with forest floor and other biodiverse organic materials changed microbiota or urban dwellers
- In intervention trials, changes in microbiota were associated with immune response of daycare children and adult volunteers

Abstract: Biodiversity loss and particularly lack of daily contacts with rich environmental microbiota has been suggested to be one of the core reasons of the high incidence of immune-mediated diseases in westernized societies. Ecosystem rewilding has been suggested to ameliorate the health and wellbeing of urban dwellers. To study this, we conducted an intervention trial in which urban daycare centers were rewilded with forest floor and other green elements. In four weeks, the skin microbiota enriched and immune regulation of children in rewilded daycare centers enhanced, while this did not happen among children in standard daycare centers. After two years, the changes in microbiota were still visible even though the forest floor was tramped. In another intervention trial, urban children were supervised to play in microbial enriched or placebo sand. After two weeks, immune modulation was ameliorated among children in the intervention group. In a third intervention trial, forest-based microbially diverse soil or placebo-soil was used to cultivate vegetables indoors. In four weeks, immune regulation enhanced in the intervention but not in the placebo group. Taken together, our findings suggest that daily contact with forest floor or microbially rich organic soil balances immunomodulation of urban dwellers. These finding provide tools for forest and nature-based therapies.

Keywords: forest soil, microbial community, immune response, rewilding

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Forest kindergarten as a space of building interspecies relationships

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HIGHLIGHTS:

- Children's daily contact with forests affects the growth of mindfulness,
- Gaining experience and knowledge about wild plants and animals reduces the previous fear of unknown species,
- Building children's relationships with other species results in a higher level of nature protection in the future

Abstract: The forest kindergarten is a place where children can experience year-round unstructured play surrounded by nature. Depending on the country, it can be organised in different ways - from trips to the forest lasting several hours to having own part of the forest and an infrastructure adapted to the needs of children and staff - a building, yurt, container. The concept of forest kindergartens was born in the 1950s in Denmark. In a qualitative study conducted for the needs of the doctoral dissertation "Excluded by/from nature. The egalitarianization of forest education in Poland" over a year of daily participant observation in one of the forest kindergartens in Poland was done. The research was complemented by interviews with teachers and parents and rich visual materials. It was observed, that some children, at the beginning of kindergarten were afraid of wild animals and unknown plants. Over time, the children showed increasing levels of mindfulness and decreased anxiety. This manifested itself among others, in noticing a higher number of species around and taking care of them. It was noticed that children formed relationships with plants from their immediate surroundings and with observed animals, which contributed to peer and intergenerational ecological education and actions to improve the state of the environment led by children themselves.

Keywords: forest kindergarten; outdoor education; human-nature connection; interspecies relationships; children and nature

6th INTERNATIONAL CONGRESS ISFT FOREST AND ITS POTENTIAL FOR HEALTH 18th - 20th September 2024, Druskininkai, Lithuania

Children's health forest, a model project in Mecklenburg-Western Pomerania/Germany

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HIGHLIGHTS:

- The municipality of Lohmen in MV is working on a 'Future Programme 2030' with a 'Children's Health Forest' component. The municipal forest area adjacent to the kindergarten is being used for this purpose. This forest will also be redeloped over the next 15 years in line with the requirements of climate change. The tandem of forest health and health potential in kindergarten will be brought together in the pilot project.
- Tapping into the programmes and effects of forest education for children's health requires comprehensive local prerequisites and at the same time the use of national and international experience as well as international partners.

Abstract:The overall health status of children and adolescents within the EU is generally high; however, there exist numerous differentiations, dangers and emerging risks. Current examples include lack of physical activity, media addiction, obesity, type 2 diabetes, behavioural problems, drugs and more.

The relationships between children's health and spending time in nature and forests are well documented in studies. Positive effects on health include stress reduction, positive cognitive, emotional and physical development, strengthening resilience and much more. In forest education, good and effective programmes have been developed and extensively tested in forest kindergartens. Tapping into nature and the local forest as a permanent therapeutic agent for kindergartens is a worthwhile international objective for promoting child health in the EU.

The municipality of Lohmen (900 inhabitants) in Mecklenburg-Western Pomerania/Germany https://www.lohmen-mv.de was honoured as 'Municipality of the Year in 2023'. With a network of science, business, international partners and the population, work is being carried out on the 'SeeblickRegion 2030' future programme with the 'Children's Health Forest' component. Tourism, health region and climate neutrality are further focal points. The municipal kindergarten and after-school care centre 'Waldgeister' has 90 places and is located directly next to the 37,000 m² forest area. In less than ten years, the International Society for Forest Therapy has established itself as an important international player in forest prevention and forest therapy with content, certification programmes for healing and spa forests, international events and networks. This experience is to be incorporated into the tandem project Children's Health Forest and Forest Restoration.

Keywords: Kindergarten, forest education, children's health forest, climate adaptation forest, ISFT healing and spa forest certificates

The effect of residential greenness and physical activity on children's mental and general health: a Kaunas cross-sectional study

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HIGHLIGHTS:

- Greater residential greenness is associated with improved general and mental health in children.
- Spending more time in parks is linked to decreased sedentary behaviour and lower risk of poor health and obesity in children.

Abstract: The evidence suggests a beneficial association between greenness exposure and children's health issues. The aim of this study was to determine the association between levels of residential surrounding greenness, children's park use, and mental and general health. Methods. This cross-sectional study included 1489 children - residents of Kaunas city, Lithuania. Using GIS, we estimated exposure to greenness by the normalised difference vegetation index (NDVI), and children's health and physical activity by questionnaire. Results. Multivariate logistic regression analysis showed that lower residential greenness was associated with poorer mental and general health. Every additional hour of time spent in parks was associated with decreased sedentary behaviour and a lower risk of poor health. Compared with NDVI-100 m > median and park use exceeding 5 h per week, lower greenness exposure and shorter park usage were associated with the increased risk of poor health. Living close to an urban park reduces children's risk of overweight and obesity. Conclusions: Higher residential greenness levels and children's physical activity in a park have beneficial effects on children's general and mental health. Physical activity in green spaces is recommended as a measure to decrease children's overweight and obesity and improve general and mental health among children.

Keywords: children; green spaces; mental health; general health; obesity

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Europe's first children's health & healing forest – children's health in transition

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HIGHLIGHTS:

- 1.Children's healing forest in Europe
- Children's health is a child's right
- The forest healths our children

Abstract: Even at a very young age, children have different health problems than they did 40 years ago: overweight, disorders in relation to sleep, motor skills and concentration, respiratory tract disorders, strengthening of eye muscles, interaction within the group tend to appear at a much younger age.

The UN Convention on Children's rights states that children have a right to grow up healthy.

Therefore the first European health & healing forest for children was certified in Heringsdorf /Germany on September 20.th 2021exactly on World Children's day. Main indications: Promotion and development of mental abilities (in relation to psychosomatic illnesses, fears, depression) obese children, respiratory tract disorders, strengthening of eye muscles, interaction within the group, dermatological problems ore skin diseases.

The key prerequisites for the preparation of the medical expert report by Prof. Kraft were :on the climate, on the air/ fine dust, on the forest topography and the list of criteria for the health & healing forest structure.

Forest therapy can slow down the consequences of these changed childhood and contribute positively to the psychological, social and physical development of the children.

17 Therapy stations: Opening up a play and living space meets the elementary needs for movement, for antonomous design of play and action option and stimulation of all senses.

Special features of this forest, which is exposed to the mild climate of the Baltic sea and thereby is the world's first healing forest in this supportive climate, are its proximity to three rehabilitation clinics and one mother-father-child clinic and several training opportunities especially adopted to children's needs. Analysis: Questionnaire 2023 survey on the health, preliminary results -high acceptance and effectiveness of the listed indications.

Keywords: Children's healing forest; Health in transition; Medical concept of the healing forest

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6th INTERNATIONAL CONGRESS ISFT FOREST AND ITS POTENTIAL FOR HEALTH 18th - 20th September 2024, Druskininkai, Lithuania

Old growth and mature forests: spiritual values and values for human spiritual health -an European perspective

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HIGHLIGHTS:

- -Old-growth and mature forests are seen as sacred spaces in many cultures, including European traditions.
- -These forests are crucial for biodiversity and ecological balance.

Abstract: Old growth and mature forests have outstanding values from a natural heritage point of view, especially biodiversity. However, the reason why they had been preserved in many parts of the word stems from their intrinsic, spiritual value, related to sacredness in most worldviews, including European cultures before the scientific revolution. The paper has two aims: (i) discussing the present spiritual values of old growth and mature forests from an intercultural point of view, focusing on Europe, and (ii) exploring the relationship of old growth and mature forests with human spiritual health, weaving the holistic approaches adopted in contemporary initiatives such as the «One Health» and the «Healthy Parks, Healthy People» with traditional perspectives such as those still alive in several European countries, connected with Pre-christian, Christian and Islamic heritages.

Keywords: Old growth forests; spiritual value

Biodiversity and old-growth forests: what's unique in Lithuania and why it's important to preserve it

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HIGHLIGHTS:

- What is an old-growth forest? Who lives in it and why is it important to preserve it?
- What to do? How was the film Ancient Woods born, and then the Ancient Woods Foundation? What is the mission?

Abstract:

Strict nature reserves are the only areas in Lithuania, where forests have the potential to turn into ancient woods. As of now, they make up only 1.225% of Lithuanian forest territory.

Although the average age of the trees within can reach three hundred years, in Lithuanian reserves it only manages to get to the age of seventy five.

Nevertheless, it's possible to find forest fragments with an average lifetime of almost two hundred years, yet they make up less than one percent — 0.0009% of Lithuania's land.

Due to mass felling, many species that require constant, slow-changing conditions, found only in old forests, are rapidly declining. Around 80% of protected forest insect species are in great danger, due to the lack of dead wood, which also threatens many species of fungi that decompose it.

The remaining community of plants, animals and microbes depend on these two species, enabling an uninterrupted chain of life, with each link providing one another with food and housing.

Mission of the Ancient Woods Foundation is to preserve the most valuable old-growth forests and protect their biodiversity, to establish public forests in Lithuania, create long-lasting examples of sustainable nature that are essential for preserving biodiversity and mitigating the effects of climate change - old-growth forests that are open to the public. The vision: Lithuania - where nature belongs to itself, and is allowed to develop without any human influence, where all organisms are equal, and no one is thought of as harmful.

Keywords: old-growth forests; biodiversity; protection

Sacred forests in Lithuanian history. What will be their role in the future?

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HIGHLIGHTS:

- Lithuania's sacred forests are an important, but still unacknowledged and unprotected part of its heritage
- Continuing the tradition of sacred forests, it is proposed to establish spiritual forests in state and private forests

Abstract: Historical sources begin to provide information about sacred forests in Lithuania in the 14th century, during the war with the Teutonic Order. Descriptions of the war routes to Western Lithuania refer to the five sacred forests in different locations as geographical points, usually with their proper names. The Crusader camps were often located near the sacred forests. In this context, the connection between sacred forests and bodies of water, as revealed by the reports of military scouts, becomes more understandable. However, there was also a deep mythological connection between the sacred forests on the one side and the rivers, lakes and marshes on the other. There is reason to believe that the names of the sacred forests coincided with the names of local deities.

In 2020, the Ministry of Environment of the Republic of Lithuania initiated the National Forest Agreement. Around 300 participants from all stakeholder groups, divided into 17 sectoral groups with facilitators, followed co-creationist principles and sought certain agreements. Members of sectoral group on cultural heritage were the ones who spoke about the spiritual relationship between people and the forests. The starting point was the fact that before the introduction of Christianity, forests considered sacred in Lithuania played an important role. They were presented not only in religious, but also in the political, administrative and defense centers of the country.

Members of the cultural heritage group participating in the National Forest Agreement have seen these sacred forests, known generically as *alka* or *alkas* (Lith.), as an important and relevant concept in which the goal of preserving forests could be realized today, the protection of significant heritage sites could be ensured, and a permanent space for the spiritual practice (not excluding the newly emerging hybrid forms of spirituality) could be created and legitimized. Together with the existing recreational forests for active recreation and leisure, such spiritual forests throughout Lithuania would become spaces where the human relationship with the forest and nature in general would be nurtured and fostered.

Keywords: Baltic religion; sacred forests; spiritual relationship

How can science prove that plants sense?

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HIGHLIGHTS:

- Plants sense their environment and communicate with each other.
- Current science can demonstrate that plants use signaling network.

Abstract: Plants stimulate our senses constantly, but most of us rarely consider them as sensory beings. Moreover, plants have sophisticated signaling network and live interesting social life. How can it be proven by scientific methods that plants sense their environment and communicate with each other? Despite the lack of eyes, plants possess at least 11 types of photoreceptors. It helps optimize photosynthesis, detect neighbors, train their circadian clocks, determine when to start flowering, and when to start going dormant for the winter. Scientific methods can relate activity of each photoreceptor and physiological functions in many plant species. Plants don't have noses, but they have an olfactory sense. Plants under attack emit a variety of volatile chemicals to warn their neighbors. Plants contain receptors for different soluble molecules, including jasmonic acid, a stress hormone, therefore plant possess taste sense. What methods can we use to record that plants can smell or hear? Plants can sense touch, gravity and sound. Sounds around plants include not only vibrations produced by insects - plants even benefit from the ability to detect certain sounds produced by other plants. Plants sense their state of health, whether they are getting enough water or nutrients. How might we understand that plants analyze information about the external environment, communicate with others and then take the action. Current science can demonstrate that plants have an integrated network of sensory systems that trigger short-term responses and long-term adaptation for living with ever-changing environment.

Keywords: plant signaling; plant sensory systems; communication in plants

Rafaeleseden: The value of conservating the sacred pristine forests and it's healing power

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HIGHLIGHTS:

- The Sacred Value of Pristine Forests
- Herbs and Medicinal Forest Plants
- Non-Wood Forest Products and Services

Abstract:

Pristine forests hold profound sacred and ecological significance, embodying the essence of natural purity and resilience. This presentation explores their value, focusing on their sacred essence, healing potential, and ecological benefits. Sacred forests, revered by indigenous cultures, are not merely repositories of biodiversity but are also perceived as spiritual sanctuaries, embodying cultural heritage and providing a sense of connection with the divine. Furthermore, these forests harbor a treasure trove of medicinal herbs and plants, which have been used for generations to treat ailments and enhance well-being. Additionally, non-wood forest products and services derived from these ecosystems, such as clean water, climate regulation, and ecotourism, contribute significantly to human welfare and economic development. The conservation of pristine forests is therefore imperative, not only to preserve their intrinsic value as sacred spaces but also to harness their healing power and ecological services for the benefit of current and future generations.

Keywords: Pristine; Medicinal; Sacred.

6th INTERNATIONAL CONGRESS ISFT FOREST AND ITS POTENTIAL FOR HEALTH 18th - 20th September 2024, Druskininkai, Lithuania

Nature schools of Protected areas – base for perception and understanding of nature

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HIGHLIGHTS:

- Learning in nature, learning from nature
- The basis for staying in nature created in 9 protected areas

Abstract: Lithuania has developed the comprehensive system of protected areas. National and regional parks are established not only for conservation of nature and culture values, landscape and biodiversity, but for development of ecotourism, for education. Nature schools are established in 9 National and Regional parks and in biosphere reserve. They located in different landscapes: in forests, at seaside, etc. Before the establishment of Nature schools people could get just lesson for several hours, now they can stay for a few days or for all week and go deeper to different aspects of nature processes, etc. Different education programs in each Nature school are developed. Education programs are based on real values (they are different in different protected areas) which are conserved in one or another protected area. Feeling of nature, of different processes of nature is the background for education in nature. There are possibilities to develop programs integrating nature therapy and these programs could be implemented by specialists from different institutions.

Keywords: protected areas; Nature school;

Sophrology and Shinrin-yoku: Complementarity in the service of human health

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HIGHLIGHTS:

- What science tells us about the real benefits of trees on the human brain and body.
- How to ease participants into the right conditions to make the best use of the benefits of the forest.
- How to prepare a course through nature that is progressive, comprehensive, and adapted to the participants' needs.

Abstract:

Both sophrology and Shinrin Yoku, with their own attributes and practices, carn help improve human health. However, many years of practice (whether to get out of a Burn-Out and depression myself, or with clients later) have taught me that these two methods, when practiced together, prove complementary and mutually-enriching for the benefit of our health, whether physical or mental.

As a psycho-corporeal method designed in the 1960s by neuropsychiatrist Alfonso Caycedo, sophrology allows one to reconnect with both body and mind, and to place oneself in the right conditions to fully receive the now recognized benefits of an immersion into nature in general, and forests in particular: absorption of phytoncides, reduction of stress hormones, increase in serotonin, limitation of ruminations, etc.

Yet, in a contemporary society that falls increasingly victim to what is now recognised as "techno stress", a substantial number of participants in such forest therapy sessions as Shinrin Yoku arrive in a state of physical and mental disconnection (with such symptoms as blocked breathing, limiting beliefs, bodily tensions, etc.) that de facto limits the effectiveness of the practice. It is thus recommended to accompany them along the path with successive steps of physical and mental movements, adjusted each time to the itinerary, landscape, and species of trees encountered, to best fit the forest environment being explored and thus better experience its benefits.

This presentation will detail this step-by-step journey as developed in my work "Chemins de reconnexion", published in French (now also available in Chinese version), as an explanation of how to optimize the use of Shinrin Yoku for the greatest number of people in a state of chronic stress or depression.

Keywords: sophrology; Forest therapy; reconnection.

Partnership Between Society, Government and Business: a case of Lithuanian's National Agreement On Forests

GRIŠKONYTĖ AISTĖ

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HIGHLIGHTS:

- Co-creation as a way to build partnerships between society, government and business in future forest management decisions.
- Practical problems in the application of co-creation, leading to guidelines for a more effective application of the principle in the future.

Abstract: Today's society wants to be involved in decisions about its future, especially on important issues such as forest governance. Governance therefore needs to change fundamentally and be based on co-creation, allowing for partnerships between society, government and business. Co-creation is not new, both at the theoretical and practical level. However, in today's context, it requires new forms and approaches, particularly in the context of building partnerships based on trust, where different interest groups - economic, ecological and societal, as well as political institutions, intersect. The aim of the study is therefore to assess the experience of the first attempt to apply co-creation in Lithuanian forest policy (the case of the National Agreement on Forests) and to identify the problematic aspects of the involvement of different stakeholder groups. The study examines the practical aspects of the application of the co-creation principle, based on interviews with representatives of various sectoral interest groups and politicians involved in the process. This will provide guidance on how to implement the co-creation principle more effectively in the future.

Keywords: co-creation; inclusive governance; National Agreement on Forests.

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Children in the Forest: Evolution of Human-Natural Environment Relations and their Representation in Artworks

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HIGHLIGHTS:

- The importance of childhood in establishing a connection with nature is major. It is suggested that early exposure to nature leads to a deeper connection in adulthood.
- The relationship with nature is also a key factor in creating sustainable cities.

Abstract: The beneficial impact of nature and forests on humanity begins with the intricate relationship between people and the natural world. This connection with nature in today's context is a complex thing. It varies based on factors such as the type of natural environment, the individuals involved, and access to these settings. Many authors also emphasize the importance of childhood in establishing a connection with nature. It is suggested that early exposure to nature leads to a deeper connection in adulthood. Unfortunately, as a growing number of people, particularly children, spend most of their time in front of screens, solely perceiving information visually without engaging their other senses or moving, significant societal and environmental changes may occur. This study was conducted to analyze the relationship between humans and forests, its importance, and methods to enhance it in people's lives. The main findings stem from a systematic analysis of literature and an examination of works of art, specifically paintings featuring people in natural landscapes. The study's results illustrate a mutual relationship between nature and humans, which has evolved throughout different historical periods, defining the landscape as an interface between nature and people. These findings underscore the importance and relevance of this topic, as a stronger connection to nature indicates higher environmental values and more proactive human behavior toward nature conservation. Individuals who feel connected to nature are more inclined to protect it. This is also a key factor in creating sustainable cities.

Keywords: forest, natural environment, children, relationship, artworks.

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Enhancing Student Well-Being Through Nature-Based Workshops: A Qualitative Study on Educational use of Parks

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HIGHLIGHTS:

- Students reported increased relaxation and reduced anxiety, stress, and fatigue after participating in the nature-based workshop.
- Enhanced focus and concentration were noted in the park environment compared to traditional indoor classrooms.
- A decrease in mobile phone use during the workshop indicated greater engagement with nature and the activities.

Abstract: This study researches the experiences of students from the University of Zadar who attended "The parks for Mental Health" workshop, aiming to evaluate the effectiveness of different nature-based methods in cultivating mental health. The workshop incorporated five different techniques designed to foster a connection with nature and promote well-being: mindfulness practice using the five senses, grounding techniques, breathing exercises, forest therapy through conscious walking, and art therapy through nature-inspired drawing.

A qualitative research was conducted using the semi-structured interview method, the research type – thematic. The study involved 20 social-science students, age group 20-30 years old. Three primary themes emerged from the data. The first theme revealed significant improvements in students' mental health, with participants reporting feelings of relaxation and ease after the workshop, in contrast to the anxiety, stress, and fatigue they felt beforehand. The second theme highlighted that students felt more focused and concentrated in the park despite potential distractions, compared to indoor classrooms. The third theme noted a reduced need for phone use during the workshop, as students were more engaged with nature and the activities, resulting in less reliance on digital distractions. The insights of students' experiences are better mental health, more concentration, deeper connection with nature and themselves.

Although parks are typically associated with personal time, the research suggests that they can also be valuable settings for educational purposes and well-being improvement. Incorporating more nature-based activities and using parks as alternative classroom environments could significantly benefit students, especially during stressful examination times.

Keywords: nature-based workshop, student well-being, educational environments.

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A comparative study of terpenes in needles and air in Kranjska Gora, Slovenia

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HIGHLIGHTS:

- We demonstrated the presence of terpenes in the samples of needles and air.
- Among the more important monoterpenes of the forest were α -cadinol, α -pinene, β -pinene and limonene.

Abstract: Research on the benefits of recreation in the forests is gaining relevance worldwide, especially in the post-Covid aftermath (Zorić et al, 2022; Bachinger et al, 2024; Choi et al, 2022). Among terpenes, identified predominantly coniferous forests, previous research identified linalool's calming effect, while limonene can uplift mood, and alleviate stress, anxiety, and depression (Komori, Fujiwara and Tanida, 1995; Andersen, Corazon and Stigsdotter, 2021). β-caryophyllene has anti-inflammatory and antioxidant properties (Scandiffio et al., 2020), whereas β -caryophyllene and limonene have demonstrated anticancer properties in preclinical studies (Venditti et al., 2022). α-pinene and terpinolene have been shown to have antimicrobial effects against various pathogens (Aloui et al., 2021). A preliminary study (Lešnik and Simonič, 2023) of determining terpenes in spruce needles in Kranjska Gora, Slovenia, identified the sequence of terpene abundances comparable with other studies (Zorić et al. (2022); Back et al. (2020)). A comparative needles and air analysis was performed in late spring 2024. To our best knowledge, this is one of the first studies, identifying terpenes in the combined terpene analysis in spruce needles and air. Identification of the terpenes was performed using solid micro-phase extraction, followed by gas chromatography with mass spectrometry (GC-MSD). Compared to previous analysis, the present study demonstrated the presence of higher values of α -cadinol, α -pinene, β -pinene and limonene in the sample of needles. The results confirmed the positive effects of recreation in the forest on health and the prevention of diseases, particularly in springtime. The air samples were pumped through adsorption tubes; however, the presence of terpenes was not confirmed. Next step would be applying the passive air sampling method.

Keywords: Spruce needles; Air analysis; Terpenes; GS/MSD

Forest pedagogy - a compulsory subject of forestry education in Lithuania

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HIGHLIGHTS:

- Forest pedagogy is a part of contemporary forestry education in Lithuania.
- Modern society can form a sustainable connection with nature with the professional guidance of foresters.

Abstract: In Lithuania, foresters have been teaching non-formal nature education to young people since 1922. Forests are an exceptional educational environment for children and young people, providing the joy of discovery, challenges, and a connection with nature. They are ideal for acquiring knowledge, strengthening independence, and learning cooperation. However, in today's society, especially among the younger generation, profound experiences with nature are no longer taken for granted. It is important to have professionals who can efficiently guide them in "getting to know nature" throughout all seasons. As of 2022, "Forest Pedagogy and Communication" will be a compulsory subject for first cycle forestry programme students at the Faculty of the Forest Sciences and Ecology at the Vytautas Magnus University. Forest pedagogy activities, utilising experiential nature learning methodologies, develop emotional, social, and cognitive learning, promote responsibility and sustainable living practices essential for overcoming future challenges. This course is designed to provide fundamental content and work methods of forest pedagogy in accordance with the principles of education for sustainable development. It enhances pedagogical-didactic competence and communication skills, enabling students to design, organise, and conduct forest pedagogical events for different age groups of children, young people, and adults. The course educates a respectful, holistic and public-interest perspective in the field of forest sustainability. Participants gain both theoretical and practical knowledge, developing their personal potential in forest pedagogy.

Keywords: university studies, forest pedagogy, holistic relationship with nature.

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Embodied Connections: Exploring Somatic Experience in Nature

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HIGHLIGHTS:

- Guided Mindful Movement: Engagement in practices that encourage conscious movement, deepening the connection between body and environment; outside space as an extension of internal.
- **Sensory Awareness Activities:** Practice of interoception and exteroception to strengthen deeper sense of presence and attunement with nature.
- **Experiential Learning**: Participation in activities designed to enhance somatic awareness, grounded vitality, resilience and awe.
- **Reflective Discussions:** Sharing experiences and insights with fellow participants to expand the personal experience nature's embodiment into the collective experience.
- **Nature's Healing Potential:** Discover how natural spaces can influence our nervous system, promoting well-being and inner balance

Abstract: This is an immersive workshop that delves into the profound interplay between somatic awareness and the natural environment. This unique session will explore the concept of somatic experience in forests, highlighting a deeper connection to our bodies and the natural world. The objective of this project is to offer participants a unique opportunity to integrate sensing and perceiving how spaces affect us and our nervous system, how presence with inner and outer space brings a transformational sense of awe, and how to regain an innate understanding of nature's healing and cleansing properties.

Participants will be encouraged to engage in mindful movement and sensory awareness techniques, fostering a deeper connection to both their inner selves and the natural world around them. Experiential activities will invite attendees to attune to their embodied experiences, promoting overall well-being and strengthening their relationship with the environment. This workshop focuses on deepening our connection to nature, enhancing interoception and inner resilience, and exploring the therapeutic potential of somatic practices within forest settings.

The further research of this will take place in October, in Trondheim (NORWAY), expanding it into an audio guide and focusing on therapeutic benefits and artistic nature-based tourism awareness.

Keywords: somatics; embodiment; nature

The power of forest walks - beneficial effects on personal, professional and planetary well-being.

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HIGHLIGHTS:

- Forest walks are a simple and accessible way to improve general health and well-being.
- Immunity enhancement as a result of exposure to phytoncides, organic compounds derived from trees.

Abstract: Forest walks may become a therapeutic experience that can potentially benefit physical, mental, and emotional health. According to the research, immersing oneself in nature, particularly forests, may enhance their overall well-being. This practice, often called "forest bathing" or "Shinrin-yoku," is based on mindful engagement with the forest environment, leading to a group of health benefits. From the physiological perspective, forest walks may contribute to reduced blood pressure, lower heart rates, and enhanced immune function, attributed to exposure to phytoncides, natural chemicals emitted by trees. From the psychological perspective, such walks may reduce stress, anxiety, and depression, fostering a sense of tranquility and mental clarity. Moreover, regular forest walks encourage physical activity, which may contribute to improved cardiovascular health and weight control. Socially, when done in groups, forest walks can strengthen community bonds and encourage environmental stewardship, fostering a deeper connection with nature. In an increasingly urbanized world, incorporating forest walks into daily life may become an accessible and effective way to enhance overall health and human well-being. Being close to nature and forest in particular, may also help individuals in developing of their personal, professional and planetary well-being, which is the topic of the SWEPPP project (Sustainable Well-being - Education for Personal, Professional and Planetary more information about the project can found https://www.wellbeing4sustainability.eu/).

Keywords: forest walks; personal, professional and planetary well-being; SWEPPP project

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