

WHY IS NATURE RESTORATION CRITICAL TO IMPROVING HUMAN HEALTH AND WELL-BEING?

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Authors:

Maren Gvein, McKenna Davis (Ecologic Institute)



Well-functioning ecosystems are critical for ensuring human health and well-being through the provisioning of key services (e.g. climate regulation, nutrient cycling and resource provisioning) and wider physical, mental and psychosocial co-benefits [1]. The delivery of these services is more important than ever, under threat from ecosystem degradation and extreme weather events and disasters.

The most obvious direct consequences for physical health are deaths caused by these events. Over 200 deaths were associated with floods in Germany and surrounding areas in 2021 [2], while around 130,000 people die annually in Europe due to heatwaves [3] and about half a million [4] as a result of poor environmental quality, such as air and water pollution. As for mental health, consequences include Post-Traumatic Stress Disorder and depression related to displacement and property loss, loss of labor for farmers due to drought, heat-related stress, and (eco-)anxiety [5]–[7]. Other chronic diseases, stress, and sleep disturbances are also related to long-term exposure to environmental noise [8].

Nature restoration has the potential to generate healthier living environments for people and mitigate physical, mental and social health threats through the protection and enhancement of biodiversity and the promotion of healthier and more resilient ecosystems [9], [10].



Bihor County, Romania, Photo by Larisa Birta

HOW CAN THE NATURE RESTORATION LAW CONTRIBUTE TO IMPROVED HUMAN HEALTH AND WELL-BEING IN EUROPE?

The NRL proposal [11] sets the basis for ensuring long-term ecosystem and societal resilience. 'Protecting human health' (from Article 191 in the Treaty of the Functioning of the European Union) is one of four objectives of the NRL. The following articles of the proposal are of particular relevance for human health:

- Restoration of **freshwater ecosystems** is important for water safety and clean drinking water (article 4).
- Enhanced **biodiversity in terrestrial, coastal, freshwater, and marine ecosystems** can play a crucial role for both mental and physical health. Ecosystem restoration can further contribute to build resilience to extreme events such as floods or drought (article 4 and 5).
- Restoration of **marine and agricultural ecosystems** is important to ensure food safety and nutritious food supply from sea and land, and for improved mental health for fishing workers and farmers (article 5 and 9).
- Increased **green spaces and tree canopy** in cities, towns, and in infrastructure is crucial for good air quality and to reduce heat stress in cities, with large impacts on mental and physical health (article 6).
- Restoration of **pollinator populations** plays a crucial role in the supply of nutritious food... (article 8).
- Biodiversity in **forest ecosystems** and nature in general have high importance for mental and physical health. Forests are also important for increased air quality and evapotranspiration (article 10).

People living in (peri-)urban areas are frequently exposed to environmental risks such as air and noise pollution, stress from traffic and population density, and heat urban islands. Exposure to urban green and blue areas (such as urban forests, ponds, etc.) can have significant health benefits [11], [12], including **reduced noise exposure and cleaner air** as well as fostering **stress relief**. Blue and green urban and rural areas can serve as positive contributions both as treatment for mental health challenges (through for example ecotherapy [13]) and as a recreational purpose [3], [12]. Direct exposure to a natural environment (compared to a busy urban environment) can decrease the activity of amygdala in the human brain [11], which is the opposite of the expected reaction for a person in a stressed situation. As such, it is an emerging trend in some places to prescribe birdwatching and walks in nature as treatment for chronic illnesses [14]. Increased forest and vegetation cover can also **cool and regulate the microclimate** through transpiration. One study suggests that in Norway, one tree planted is foreseen to mitigate the heat exposure of one heat sensitive person every day [15].

Within rural areas, nature restoration can contribute to enhanced biodiversity in above and below ground habitats, increased evapotranspiration, more diverse landscapes, and increased carbon stocks [16]. Related health benefits include increased **food safety** more **nutritious food**, as well as **resilience to droughts**, and thereby enhanced and more stable **working conditions for farmers** [17]. Agroecology, which is closely related to nature restoration, is an emerging concept associated with stronger food systems and increased well-being in farming communities, as well as enhanced biodiversity and healthy soil [18]. Increased vegetation cover is also an important measure to avoid freshwater toxicity, where green infrastructure could contribute to a 50-80% reduction in polluted run-off to rivers [19]. In light of the COVID-19 pandemic, the NRL has an important role to play in **building resilience to future communicable diseases and potential pandemics** and in implementing the One Health approach [20] within the EU policy landscape – linking ecosystem, human and animal health.

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