

Preventing biodiversity loss with ecological restoration

Restoration of watersheds, wetlands, and forests is a way to compensate for the human-caused damage on biodiversity. Halting biodiversity loss is essential for safeguarding ecosystems and human well-being. A key to successful restoration is targeting large enough landscape units. For example, planning at a catchment level can ensure that a forest drainage conducted upstream does not threaten the condition of the waterbodies downstream.

Recommendations

The effectiveness of ecosystem restoration in Finland can be improved by setting measurable national goals that all sectors in society commit to. Getting landowners, entrepreneurs, citizens, and authorities to join the effort is crucial for the success of restoration. Also sectors responsible for the damage need to be engaged.

Legislation is a way to ensure an adequate level of restoration. The Forest Act should be amended to favour continuous cover forestry on peatlands. This would reduce the need for drainage while improving the carbon balance. Meanwhile, the habitats of species living in waterbodies and peatlands would also improve. The Forest Act should also secure adequate buffer zones around watercourses and Water Act should be used to reduce the harmful impacts of drainage.

Actors in agriculture and forestry have such practical knowledge and skills that is essential in restoration. Knowledge sharing with landowners is vital, for example, on the importance of natural-state buffer zones for small streams and riparian forests and in agricultural areas. Restoration work and new practices generate new jobs. Participation in restoration opens new avenues for businesses to develop their environmental responsibility.

Land use and zoning regulation can promote the restoration of urban nature. Legislation should consider the diversity and connectivity of urban green areas. Urban nature promotes human health and wellbeing, and offers other ecosystem services, such as rainwater retention.

Finland faces a comprehensive need for ecosystem restoration.

The need for restoration is urgent in southern Finland, where the state of nature is considerably weaker and pressure on land use change is greater than in the northern parts of the country.

48% of biotopes are threatened.

76% of forest biotopes are threatened.

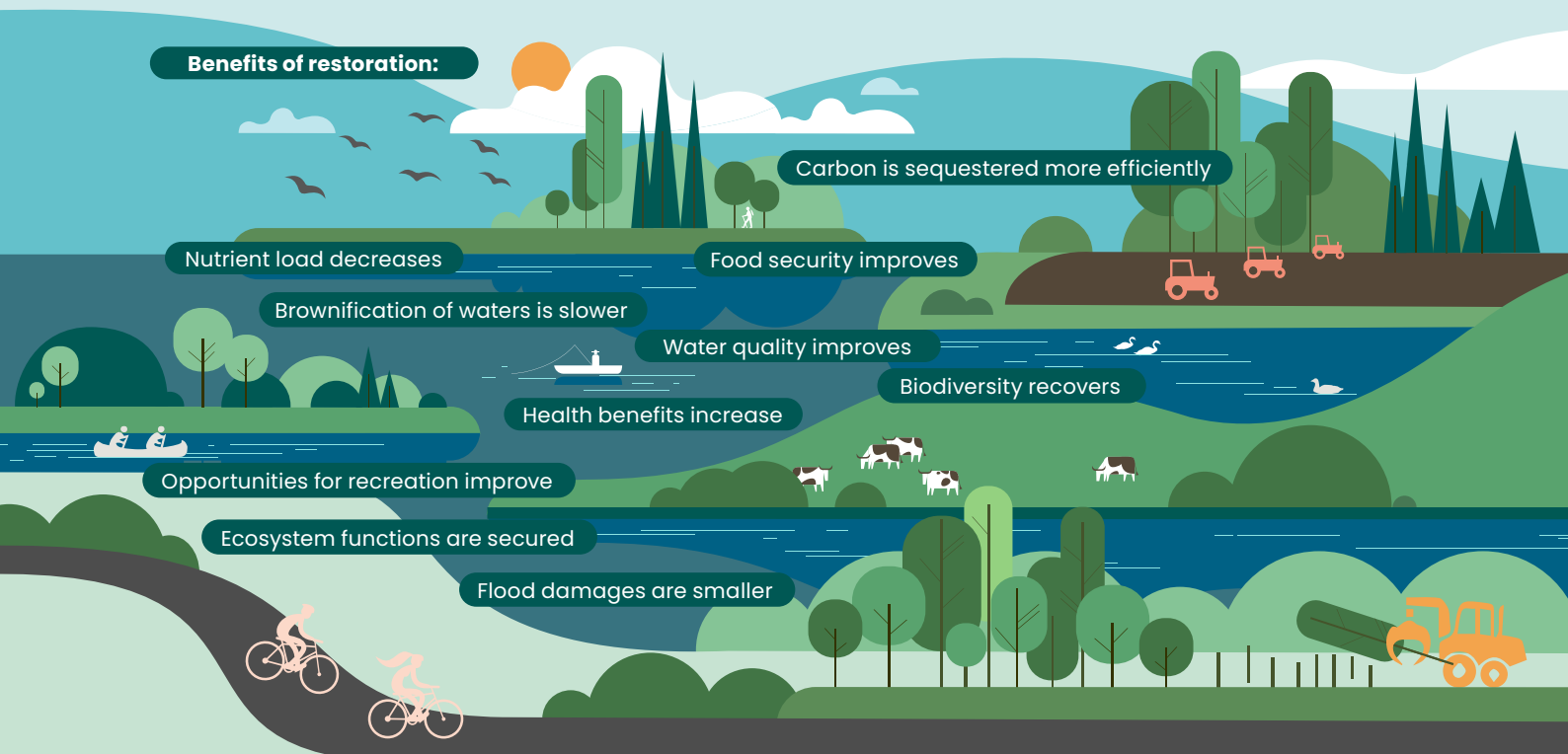
60% of wetlands have been drained or taken into other land use.

More than **90%** of semi-natural grasslands have disappeared since the 1960s.

20% of freshwater biotopes are threatened.

32% of rivers are not in good ecological status.

The most endangered biotopes of freshwaters are streams and springs.



Ways to restore:

Forests: continuous cover forest management, increasing the amount of deciduous trees and decaying wood, reducing forestry activities

Wetlands: Filling ditches to improve the water retention capacity of the wetland, thereby improving water quality downstream. Ceasing drainage ditch maintenance.

Small streams, brooks and springs: Targeted water protection measures, such as restoring drained areas and reducing loading from nearby catchment areas, improving buffer zones, and restoring the meandering of streams.

Lakes and ponds: Extensive measures are needed to reduce the nutrient load, for example from agriculture and forestry. Wetland, river, and stream restorations are needed in the catchment areas of lakes.

Urban nature: Management of green areas to improve diversity and connectivity. Letting more meadows and other areas grow in a natural state instead of planting non-native species.

Semi-natural grasslands: continuous management, for example, clearing trees and shrubbery, mowing reeds, and fencing grazing areas.

Source: Threatened Habitat Types in Finland 2018¹

What is ecological restoration and what are its benefits?

The aim of restoration is to bring a degraded or damaged natural habitat back to a good ecological state. Habitat restoration recovers ecosystem functions, which are a prerequisite for the sustainability of our society. Restoration also advances the resilience of ecosystems, improving their ability to recover from, for example floods, drought, or insect damage.

At the landscape level, restoration measures increase biodiversity and safeguard ecosystem functions. Thereby, restoration further helps to secure ecosystem services, such as water purification, food production, and climate change adaptation.

Restoration refers to active operations – filling in ditches, controlled burnings, grazing, or removing invasive species. Yet, also measures significantly reducing the intensity of land use and exploitation of natural resources can also be seen as restoration. Examples of these include giving up drainage maintenance or leaving wider forested buffer zones along the riparian areas of waterbodies. In this sense, restoration is linked with other means of protecting ecosystems – conservation and sustainable resource use.² Restoration can be a one-off operation or conducted occasionally, or it can require continuous management.

It is difficult to evaluate the monetary benefits of restoration. However, restoration increases the quantitative and qualitative benefits that humans derive from nature. These can be assessed using methods of economic valuation. Some methods are based on the opportunity costs of the targeted ecosystem service, such as the costs of building flood barriers or reducing carbon emissions. Other methods evaluate the costs of harmful impacts, such as health care expenditure. When such valuation is not possible, assessment can be done for example by asking people how an improved living environment has affected their well-being.

Residents of Koillismaa (Kuusamo area) were asked about their willingness to pay for the benefits of restoring forest streams. Benefits of restoration included re-establishing natural flooding rhythms, the return of brown trout, and the increase in overall biodiversity and better water quality.^{3,4}

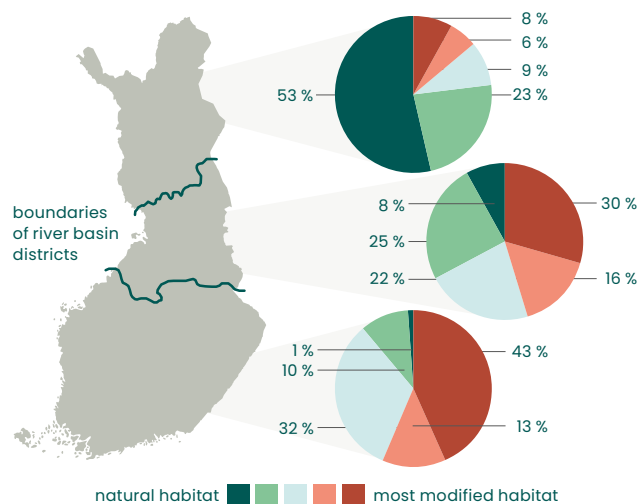
Respondents to the questionnaire were willing to pay an average of EUR 24–36 a year for these improvements. This would put the annual monetary non-market benefits of brook restoration at about EUR 330,000–780,000. The estimate reflects the annual increase in well-being among residents in the area, or conversely, the lost benefit if no measures are taken.⁴

Effects must be monitored systematically

Monitoring restored areas over a longer period is crucial because the effects and benefits of restoration emerge with a time lag. In addition, systematic monitoring allows keeping track of the direct and indirect benefits of restoration, such as change in urban biodiversity and its benefits to human health. For example, biodiversity near residential areas can support mental well-being and reduce the prevalence of inflammatory diseases.⁵

Information on restoration targets and measures is currently fragmented. Integrated analysis of data on restoration measures, monitoring, and impact assessments is needed to succeed in comprehensive restoration planning and to target regional restoration measures effectively. In addition to publicly funded projects, information is needed also on independent restoration projects conducted by municipalities and associations. They have often been effective thanks to good local knowledge. As an illustrative example, in the Kunta-Helmi habitats programme the City of Kemi is restoring areas covering 32 hectares in cooperation with MetsäFibre and Stora Enso, local associations, and the Lapland Centre for Economic Development, Transport and the Environment.

The state of streams is weak especially in Southern Finland



© Finnish Environment Institute. 2023. Source: Pienten virtavesien valtakunnallinen tilan arviointi ja mallinnus (Purohelmi) Final report (2022) (In Finnish). www.syke.fi

Forestry operations, ditching and clearcutting, are key causes for the weak status of streams. Only 1% of all brooks in Southern Finland are in a natural state. Regulating drainage under the Water Act should be amended to better address environmental impacts, and the Forest Act should be amended to establish sufficiently wide forested buffer zones to secure the nature values of streams and riparian forests.^{6,7} Landowners should be legally required to add natural ecosystem characteristics, for example by leaving retention trees. Forest owners are usually willing to protect small waters in their forests.⁸

Restoration means reversing human-caused damage on nature, but it does not justify continuing degrading activities elsewhere. Also, protection and maintaining a good state of nature is always more cost-effective than fixing damage afterwards. The primary tool for conserving nearly natural-state high biodiversity value areas is establishing protected areas.

Comprehensive restoration planning

Actions that weaken the ecological state of habitats have wide-reaching effects. For example, drainage and ditch maintenance are detrimental for both forest and inland water habitats. Damage cannot be reduced simply by using sedimentation ponds or constructed wetlands. Rather, comprehensive, catchment level planning is needed.

Restoration measures and targeting them effectively can be governed through both legislation and incentives. The incentives should be based on the national and landscape-level conservation value. The level of incentives should depend on the benefits that the restoration generates. Introducing a “polluter pays” principle would be an incentive to avoid damage. If linked with compensation measures, it would allow the targeting of restoration in areas where it would be most cost-effective.

In the future, biodiversity offsetting market could generate private sector funding for restoration work and

further help biodiversity conservation. New restoration practices and innovations generate jobs, and broader implementation of environmental responsibility can improve the competitiveness the companies involved.

Goals and legislation on the restoration of ecosystems are now being prepared both globally and in the EU.

Policy framework

- One goal of the EU’s Nature Restoration Law proposal is to spur concrete action and to achieve goals of protecting species and habitats, earlier identified as important for conservation at the EU level.
- The Habitats and the Birds Directives are the key nature protection regulations in the EU. Their goal is to achieve a favourable conservation status of species and habitats of community interest, listed in the Directives.
- The EU Biodiversity Strategy for 2030 – Bringing nature back into our lives.
- The Water Framework Directive aims at a good status of all waterbodies. Restoration measures in a catchment area reduce the pressures and load entering waterbodies and support the achievement of the goals.
- The national biodiversity strategy
- The national climate and energy strategy
- The UN Biodiversity Conference in Montreal in December 2022 agreed on goals to restore at least 30 percent of degraded habitats.
- The UN has named the ongoing decade (2021-2030) as the UN Decade on Ecosystem Restoration.

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