



EU NATURE RESTORATION LAW; EGU RESPONSE

Written by:
The EGU Biodiversity Task Force

August 2022

Introduction

The EGU Biodiversity Task Force welcomes the ambitious targets outlined in the [Nature Restoration Law](#) that was presented by the European Commission on 22 June 2022. The Nature Restoration Law's binding targets to restore degraded terrestrial land and marine ecosystems across the EU is a positive step for biodiversity and will enable the EU to take a global leadership role in many aspects of societal and environmental sustainability. It serves as a timely and critically important blueprint for other regional bodies and countries to follow and enact. Meaningful, strong, and strategic actions on biodiversity are critical for our understanding of how different species respond to both past and future environmental change.

The Nature Restoration Law comes at a critical moment when, despite EU and international efforts, biodiversity loss and the degradation of ecosystems continue at an alarming rate with up to 81% of habitats at the EU level in poor condition¹. The impacts of ecosystem degradation and biodiversity loss are not limited to the environment, affecting many essential, co-dependant components of life, society, and the economy². To ensure the Nature Restoration Law is successful, the EGU Biodiversity Task Force has outlined key points that should be added, amended, or strengthened throughout the document. The recommendations focus on Articles 4-11 from a scientific perspective. It is hoped that these recommendations will be considered by the European Parliament and the Council of the EU when amending and adopting the proposed Nature Restoration Law.

About the EGU and EGU Biodiversity Task Force

The [European Geosciences Union \(EGU\)](#) is the leading organisation for Earth, planetary, and space science research in Europe. With our partner organisations worldwide, we foster fundamental geoscience research, alongside applied research that addresses key societal and environmental challenges. Our vision is to realise a sustainable and just future for humanity and for the planet. The expertise of our 18,000 members spans many key scientific disciplines relevant to the Nature Restoration Law, including soil science, hydrology, biogeoscience, climate change, natural hazards, and ocean sciences.

As Europe's largest geoscience society, the EGU is uniquely positioned to facilitate the transfer of knowledge from research into practice and to connect policymakers to the most relevant geoscience experts. In early 2022, [EGUs Science for Policy Working Group](#) created the [EGU Biodiversity Task Force](#), a selection of eight scientists with expertise spanning a range of biodiversity-related fields as well as skills in science-communication, journalism, outreach, and policy. The Task Force aims to bridge the gap between science and policy, delivering scientific information and expertise to where it is most needed.

Recommendation 1: Prepare for a resilient future

Climate Change is a major driver of habitat transformation and biodiversity loss³. To ensure the impacts of climate change are adequately considered by EU Member States during the creation of their individual Restoration Plans, the EGU Biodiversity Task Force recommends removing Section 8b and 9b in Article 4 and 5, which justifies the non-fulfilment of obligations and unavoidable habitat transformations if they are directly caused by climate change. Member States should instead use the best available scientific evidence to predict areas of likely unavoidable habitat transformations resulting from climate change and integrate them during their planning. Furthermore, Member States should be encouraged to use robust scientific models that predict changes to habitat vulnerability due to more frequent and severe droughts⁴, fire events⁵, and flooding⁶.

Member States should use a science-based approach to understand current systems, explore advanced operational and managerial protocols and tools, and select the most effective restoration methods given the present conditions. This will not only support biodiversity restoration and promote ecosystem services, but also increase resilience to future threats⁷. The EGU Biodiversity Task Force believes that Member States should not only “carry out the preparatory monitoring and research needed to identify the restoration measures that are necessary” as outlined in Section 1 of Article 11, but also to use dynamic models to gain a better understanding about the future pressures that ecosystems are likely to face. Understanding which regions are sensitive to future pressures and how they are likely to be impacted will not only increase the likelihood of meeting their targets but may also enable Member States to take actions to pre-emptively minimise climate change impacts. Examples of habitats that may be threatened by unavoidable habitat transformations due to climate change and therefore require additional considerations during the creation of Restoration Plans include:

- ➔ Marine estuaries, which may see an increase in seasonal and baseline salinity due to changing precipitation and a subsequent decline in species richness⁸;
- ➔ Mediterranean ecosystems, which are likely to be impacted by more frequent and prolonged drought and become more prone to wildfires⁹;
- ➔ Boreal forests and peatlands, which may suffer from increasing temperatures and the encroachment of temperate species^{10,11};
- ➔ Freshwater ecosystems, which are likely to experience greater rates of eutrophication due to higher temperatures/evaporation¹²;
- ➔ Alpine and arctic regions, which may see significant shifts in snowfall, permafrost persistence, seasonal hydrological regimes, and a subsequent change in species distribution in warmer temperatures¹³.

While the targets of some Member States will be more impacted by the inclusion of these unavoidable habitat transformations than others, failing to consider them will result in lower overall restoration and reduce the subsequent potential ecosystem services and benefits that the Member State receives.

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Recommendation 2: Incorporate remediation into the Nature Restoration Law

Heavy and extractive industries have both a direct impact on biodiversity via chemical and physical (i.e. dusts and aerosols) waste, and a landscape and region-wide impact on biodiversity via secondary pathways, cumulative pathways, and fragmentation¹⁴. Europe has more than 2.5 million estimated potential contaminated sites and approximately 342 thousand identified contamination sites¹⁵ that have the potential to impact biodiversity restoration efforts. While Member States have made some progress, by 2018 only 65,500 of these sites had been remediated¹⁶. It should also be noted that while remediation efforts often focus on terrestrial systems, in some cases marine remediation efforts may be needed for effective nature restoration. Sand extraction in Europe has, for example, been shown to have an ongoing impact on marine habitats and associated benthic communities that are unlikely to be restored without active remediation efforts¹⁷.

Significant progress on the remediation of contaminated sites by 2030 was listed as one of the key EU Nature Restoration Plan commitments in the [EU Biodiversity Strategy for 2030](#), but it is not outlined or discussed in the Nature Restoration Law. Outlining the role that remediation can play in restoring biodiversity in Article 4 not only has the potential to incentivise Member State remediation efforts but support long-term biodiversity restoration targets.



Image credit: Gabriel Sigmund (imagedeo.egu.eu)

Recommendation 3: Include soil as a reliable restoration target

Soil biodiversity supports clear air, enhances the entry and storage of water, raises resistance to soil erosion, and improves nutrient cycling and retention, increases carbon sequestration, and is more resilient to climate change and diseases¹⁸. It is essential for maintaining healthy soils for agricultural practices and both urban and rural ecosystem services¹⁹. Despite its importance, soil biodiversity is threatened by a wide range of factors including unsustainable farming practices, soil sealing, pollution, land use change, erosion, climate change, fires, and habitat fragmentation.

The EGU Biodiversity Task Force therefore believes it is important for soil biodiversity to be prioritised in the Nature Restoration Law and recommends that it be included in both Article 6 and Article 9 as an additional target. At a minimum, Member States should be encouraged to improve urban and agricultural soil biodiversity in their Restoration Plans. Not only would this help to protect soil biodiversity directly, but it will also act as a complimentary indicator to the other Article 6 and Article 9 indicators, promoting a more comprehensive biodiversity restoration effort.

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Recommendation 4: Strengthen and clarify ecosystem targets

4.1 Strengthen urban ecosystem targets

As of 2015, 72% of EU citizens live in urban areas²⁰. While these spaces are often blamed for declining biodiversity levels, they also have the potential to support local ecosystems through nature-based solutions²¹. EGU's Biodiversity Task Force values the inclusion of Article 6 in the Nature Restoration Law but believes it could be strengthened with more ambitious targets.

The current targets of a 3% increase in the total national area of urban green space by 2040 and 5% by 2050 should be increased. The target of 10% urban tree canopy cover in all cities, towns, and suburbs by 2050 is also considered to be too low considering the additional ecosystem benefits this target would provide, including the mitigation of flooding, reduced heat stress and energy needs, cleaner air, and lower noise pollution. When increasing canopy cover, Member States should also be encouraged to use a diverse range of tree species that promote greater biodiversity, ecosystem services, and climate change mitigation. The selection of species should be chosen with the help of experts, based on local climatic conditions, and on their resistance and resilience to the abiotic and biotic stresses typical of urban areas.

4.2 Maintain or strengthen peatland restoration targets

Despite their high environmental, economic, and social importance, more than 50% of peatlands in Europe have been lost or converted with only a few currently in good ecological condition²². Healthy peatlands are critical for both European biodiversity and Europe's climate mitigation strategy with peatlands storing nearly 30% of all soil carbon despite only consisting of 3% of the Earth's land surface. On a global scale, peatlands store nearly 550 billion tonnes of carbon, approximately double the amount of carbon stored by all the world's forests²³. Furthermore, peatlands purify water, support healthy soils, mitigate the impacts of flood and drought, and reduce erosion²⁴. While restoring and rewetting peatlands may impede the use of some agricultural areas²⁵, the overarching benefits to the climate, biodiversity, and soil health has the potential to promote long-term sustainable agricultural systems. The EGU Biodiversity Task Force therefore believes the peatland restoration targets set by the Commission should either be maintained or strengthened with compensation offered for affected landowners where appropriate. Furthermore, the Task Force would like to see the inclusion of peatland that is located on other land types (such as forest and grasslands) in the Nature Restoration Law.

Member States should consider ecosystem functioning, eco-hydrological processes, and use knowledge-based restoration strategies when creating their Restoration Plans to ensure the most effective restoration measures are adopted and meet their intended goals. New peat accumulation, and subsequent increases to hydrological buffering and water storage capacity only form after 20 years of peatland rewetting²⁶. It is therefore important that the Nature Restoration Law requires Member States to maintain the favourable conservation status of restored peatlands and establish long-term peatland monitoring systems. Without these long-term objectives and monitoring systems, the full benefits associated with the restoration and rewetting of peatlands may not materialise.

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4.3 Create restoration milestones and extend targets

The EGU Biodiversity Task Force appreciates the Nature Restoration Law requesting Member States “show a continuous improvement in the condition of the habitat types” in Section 6 of Article 5. However, the EGU Biodiversity Task Force believes a set of milestones would enable Member States to provide accurate and useful feedback on their restoration efforts as they progress. The Task Force therefore recommends detailed, ongoing milestones are established that allow Member States to measure and report on their restoration efforts at regular intervals. These milestones could, for example, be based on ecological diversity or estimates of ecological functionality. Member States also need to consider the water management strategies that will be required in a warmer future to support Europe’s economy, society, and environment.

The EGU Biodiversity Task Force believes the 2030 restoration target (of 25,000 km of free-flowing rivers) is appropriate but recommends that Article 7 includes targets past 2030 to ensure ongoing improvements to rivers and their natural functions are made.

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Recommendation 5: Enhance the connection between ecosystems and promote multidisciplinary

Due to the inherent interconnectivity of ecosystems, it is vital that Member States ensure restoration measures are implemented using a strong systems perspective approach. The Task Force encourages the Nature Restoration Law to go beyond establishing ecosystems of good condition and additionally consider species and forest ecosystems that will generate greater biodiversity, provide more ecosystem services, and be resilient to future threats such as climate change. The Nature Restoration Law should encourage Member States to foster inter- and multidisciplinary collaboration to help understand the consequences of actions on nearby or adjacent habitats. For example, the protection and restoration of freshwater ecosystems need to be matched with the protection of forest ranges, including limiting the replanting of new trees for a period, and to allow enough space and time for natural growth. A guidance document (as mentioned in section 6.2) could support Member States in creating these connections.

The Nature Restoration Law primarily focuses on reference levels from the past when fewer pressures and risks were present. Understanding forest systems and using a science-based approach to select ecosystems and habitats that are resilient to current and future threats such as climate change will increase the likelihood of Member States reaching their biodiversity targets. Furthermore, it should be noted that ecosystems under stress may become more fragile, and as in the case of forests, faced with multiple disturbances (frequent and high intensity wildfires, floods, and prolonged drought, etc) they become open to invasive species and pests. Member States should therefore be encouraged to not only “carry out the preparatory monitoring and research needed to identify the restoration measures that are necessary” as outlined in Section 1 of Article 11, but also use fundamental research on ecosystem feedbacks and dynamic vegetation models, make projections on the hydrological cycle, invasive species of pests of concern, and balance pressures using different climate scenarios and multiple climatic drivers. This step will require close cooperation of climate and terrestrial vegetation experts, research institutions and may benefit from an EU-supported database on the current state of forests.

Finally, integrating nature-based solutions into restoration plans could also help to build resilience to future disturbances and provide environmental, social, and economic benefits through ecosystem services²⁸. These multidisciplinary solutions could be highlighted in the Nature Restoration Law through, for example, an Annex or concrete link to the European Commission [Policy Future Brief: The solution is in nature](#).

Recommendation 6: Knowledge transfer and documentation

6.1 Support the scientific community in providing advice

The EGU Biodiversity Task Force believes that information transfer and knowledge sharing among Member States will be necessary for effective biodiversity restoration. This may include a framework that promotes the exchange of relevant scientific information to support assessments or identify risks, methods of passive, active, and new restoration methods such as rewilding, restoration success stories, and best practices. Outlining the need for institutionalised information sharing in the Nature Restoration Law, perhaps through the [Trans-European Nature Network](#), will enable Member States to start preparing for this system their Restoration Plans.

The EGU Biodiversity Task Force welcomes the science-based approach used throughout the Nature Restoration Law, particularly Section 1, 3 and 8 in Article 11 that emphasises the need for Member States to use robust scientific evidence when creating their national Restoration Plans. However, Article 11 should also encourage Member States to be transparent with the information that they use and how it was collected.

Finally, Member States should be encouraged to provide greater support to local scientific networks to enable them to better leverage the assets of their community, keep pace with the ever-changing science, and more effectively engage with policymakers and the public.

6.2 Continue to publish strong guidance documents

The EGU Biodiversity Task Force appreciates the detailed [Guidance on Barrier Removal for River Restoration](#) that accompanies Article 7. The Task Force believes definitions and processes outlined in this document will support Member States in implementation processes that will enable them to meet their targets. The Task Force would welcome the prompt creation of guidance documents with similar levels of detail for Articles 4, 5, 6, 9, and 10 as these will enable Member States to better prepare their Nature Restoration Plans. Guidance on the articles mentioned should include feedback between the biotic and the physical environment, relevant best-practices, innovative strategies, and effective monitoring techniques.

Guidance should also be given on new techniques that account for and support dynamic, natural processes within restoration projects such as rewilding efforts²⁷, which rely on the recovery of processes related to the re-establishment of the trophic chain, and the strategic re-introduction of keystone and ecosystem engineering species. In addition, the Task Force believes that a guidance document on how Member States can support scientific advisory mechanisms that will connect local policymakers and practitioners with robust, relevant scientific information would be very beneficial.

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Recommendation 7: Effectively engage with society

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7.1 Drive citizen engagement through evidence-informed initiatives

Citizens have the potential to play an active role in both restoration and monitoring ecosystems. In some cases, citizens in coastal areas may also be able to help prevent the spread of invasive marine species by practicing appropriate vessel cleaning methods before undertaking recreational activity. The EGU Biodiversity Task Force appreciates Section 3.5 Stakeholder Management outlined in the [Criteria and guidance for protected areas designations - Staff Working Document](#). However, it is vital for citizen engagement to be driven through evidence-informed methods and with the support of experts to ensure unintended negative outcomes from conservation actions are avoided. For example, public enthusiasm to protect pollinators has led to the proliferation of urban beekeeping in London and other metropolitan areas. Although this public engagement is positive, the focus on the honeybee has put additional pressure on native species²⁹. With greater scientific guidance and evidence-based actions, this unnecessary pressure could have been avoided. The EGU Biodiversity Task force would therefore appreciate the inclusion of “evidence-informed citizen engagement” in the Nature Restoration Law and Section 3.5 of the Criteria and guidance for protected areas designations.

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7.2 Work with local knowledge

The Nature Restoration Law should encourage Member States to empower and equip local people with knowledge and means to support ecosystems where possible. People who live near biodiverse areas may already have useful knowledge and techniques that are specific to the region they live in. This knowledge can be utilised and strengthened by Member State through capacity building strategies and new technology, including but not limited to, drones, remote sensing, on site sensors, and phenocams³⁰. Not only this, but biodiversity restoration has a wide range of socio-economic benefits including water purification, flood protection, and the reining of urban spaces. It has the potential to encourage reverse migration, encourage community projects, and promote eco-tourism sites. The EGU Biodiversity Task Force would welcome the acknowledgement of the potential benefits that can emerge from working with local knowledge and promoting citizen science within these communities in the Nature Restoration Law as it may encourage Member States to include it in their Restoration Plan.

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7.3 Encourage a diversity in produce and crop varieties

The use of traditional varieties of crops and produce could not only increase genetic diversity but provide health benefits through more varied and nutritious diets³¹. Encouraging producers and agricultural stakeholders to consider the role of traditional crop varieties and those that are suitable to specific regions, could help Member States to promote greater biodiversity within agricultural ecosystems. This would also promote more resilient economic systems to cope with droughts and international conflicts' consequences. The European Commission is currently considering the revision of market rules for traditional crop varieties and investigating measures to facilitate the registration of seed varieties³². However, the EGU Biodiversity Task force believes that including these principles through the Nature Restoration Law may encourage Member States to already consider them in their Restoration Plan.

Further information and continued support

The EGU Biodiversity Task Force welcomes and supports Europe's ambitious nature restoration strategy and hopes this feedback is both useful and helps Europe to reach its biodiversity targets. The EGU is uniquely positioned to facilitate the transfer of knowledge from research into practice and to connect policymakers to the most relevant geoscience experts. The Task Force is also available to support policymakers on both a European and Member State level by answering evidence-based questions, translating scientific research, participating in meetings, writing fact sheets, and providing summary documents to help policymakers understand the legislative relevance of ground-breaking geoscience research.

For further information, please contact policy@egu.eu.

References from the text

- 1 [European Environment Agency news item Europes nature in serious, continuing decline](#)
- 2 [World Economic Forum New Nature Economy Report 2020](#)
- 3 [Scientific Outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change](#)
- 4 [Tschumi et al \(2022\) The effects of varying drought-heat signatures on terrestrial carbon dynamics and vegetation composition, Biogeosciences, Copernicus](#)
- 5 [Allen \(2015\) On underestimation of global vulnerability to tree mortality and forest die-off from hotter drought in the Anthropocene, Ecosphere, Wiley](#)
- 6 [Tabari \(2020\) Climate change impact on flood and extreme precipitation increases with water availability, Scientific Reports, Nature](#)
- 7 [Segan et al \(2016\) A global assessment of current and future biodiversity vulnerability to habitat loss climate change interactions, Global Ecology and Conservation, Elsevier](#)
- 8 [Koehler et al \(2022\) Species richness and functional attributes of fish assemblages across a large-scale salinity gradient in shallow coastal areas, Biogeosciences, Copernicus](#)
- 9 [Romano and Ursino \(2020\) Forest Fire Regime in a Mediterranean Ecosystem: Unraveling the Mutual Interrelations between Rainfall Seasonality, Soil Moisture, Drought Persistence, and Biomass Dynamics, Fire, MDPI](#)
- 10 [JSTOR Daily - Climate Changes Dangerous Effects on the Boreal Forest](#)
- 11 [Koehler et al \(2022\) Species richness and functional attributes of fish assemblages across a large-scale salinity gradient in shallow coastal areas, Biogeosciences, Copernicus](#)
- 12 [Feuchtmayr et al \(2009\) Global warming and eutrophication: effects on water chemistry and autotrophic communities in experimental hypertrophic shallow lake mesocosms, Journal of Applied Ecology, British Ecological Society](#)
- 13 [Dobbert et al \(2022\) The application of dendrometers to alpine dwarf shrubs a case study to investigate stem growth responses to environmental conditions, Biogeosciences, Copernicus](#)
- 14 [Mining and biodiversity: key issues and research needs in conservation science - Proceedings of the Royal Society](#)
- 15 [European Environment Agency news item - Soil contamination widespread in Europe](#)
- 16 [European Environment Agency news item - Soil contamination widespread in Europe](#)
- 17 [Mielck et al \(2021\) Persistent effects of sand extraction on habitats and associated benthic communities in the German Bight, Biogeosciences, Copernicus](#)
- 18 [Food and Agriculture Organization of the United Nations - State of knowledge of soil biodiversity](#)
- 19 [Food and Agriculture Organization of the United Nations - State of knowledge of soil biodiversity](#)
- 20 [European Commission Urban Data Platform Plus The Future of Cities](#)
- 21 [Royal Botanic Gardens, Kew - State of the World's Plants and Fungi](#)
- 22 [European Commission Peatlands for Life](#)
- 23 [UN Environment Programme - Protecting peatlands for people and planet](#)
- 24 [Tanneberger et al \(2020\) The Power of Nature-Based Solutions: How Peatlands Can Help Us to Achieve Key EU Sustainability Objectives, Advanced Sustainable Systems, Wiley](#)
- 25 [Buschmann et al \(2020\) Perspectives on agriculturally used drained peat soils: Comparison of the socioeconomic and ecological business environments of six European regions, Land Use Policy, Elsevier](#)
- 26 [Ahmad et al \(2020\) Long-term rewetting of degraded peatlands restores hydrological buffer function, Science of the Total Environment, Elsevier](#)
- 27 [Ceausu et al \(2015\) Mapping opportunities and challenges for rewilding in Europe, Conservation Biology, Society for Conservation Biology](#)
- 28 [European Commission CORDIS - Nature-based solutions: Benefits and opportunities](#)
- 29 [Royal Botanic Gardens, Kew - State of the World's Plants and Fungi](#)
- 30 [Aasen et al \(2020\) PhenoCams for Field Phenotyping: Using Very High Temporal Resolution Digital Repeated Photography to Investigate Interactions of Growth, Phenology, and Harvest Traits, Frontiers in Plant Science, Frontiers](#)
- 31 [EU Community Plant Variety Office - impact of the community plant variety rights system on the EU economy and the environment](#)
- 32 [European Commission - Study on the Unions options to update the existing legislation on the production and marketing of plant reproductive material](#)



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