FACTSHEET 3

CLIMATE BENEFITS OF INVESTING IN NATURE RESTORATION

81%
OF PROTECTED HABITATS AND
63%
OF SPECIES IN THE EU HAVE A POOR OR BAD CONSERVATION STATUS

Ecosystem restoration is not just about saving wildlife. A growing body of evidence shows that nature contributes to our overall health and wellbeing[1] and provides significant socio-economic benefits, including sustainable jobs and ecotourism opportunities. Protecting and restoring nature and well-functioning ecosystems is also a fundamental tool in tackling the twin crisis of biodiversity loss and climate change.

But today, we are losing nature at an unprecedented rate. Globally, one million species are threatened with extinction and the health of the ecosystems on which we depend is deteriorating more rapidly than ever[2]. Europe is no exception, with 81% of protected habitats and 63% of species in the EU having a poor or bad conservation status[3].

To bend the curve of nature loss and avert catastrophic climate change, protecting remaining natural places will not be sufficient – we need to invest in large-scale restoration as well.

In June 2022, the European Commission published its proposal for a Regulation on Nature Restoration, including legally binding restoration targets for various ecosystems across the EU. WWF fully supports the proposal and calls upon national governments, Members of the European Parliament and the European Commission to[4]:

- **Adopt the Nature restoration Regulation by the end of 2023**
- **Ensure that by 2030, nature restoration is happening on EU land and seas on a large scale.** We support the proposal that by 2030, at least 30% of the EU's land and at least 30% of the EU's sea area are covered by effective area-based restoration measures.
- **Ensure strong nature restoration targets for all ecosystems covered by the legal proposal.** The targets need to match the extent and urgency of the biodiversity and climate crises.

Nature restoration is the best investment we can make, as every €1 invested in nature restoration adds between €8 to €38 in economic value. This factsheet highlights just some of the health and wellbeing benefits of investing in nature restoration.

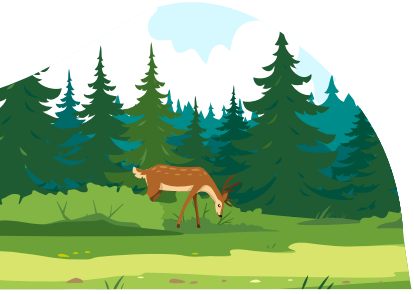
The twin crisis of climate change and biodiversity loss

Climate change and biodiversity loss are two of the greatest challenges and risks for our societies. Although the two crises are often considered separately, many of their underlying causes are interlinked and related to unsustainable development. As such, their solutions involve complementary and synergistic measures. Climate change mitigation and adaptation, in particular, require better protection and restoration of biodiversity.

To stay below a 1.5°C rise in average global temperature, we need an extremely rapid reduction in greenhouse gas emissions. But this has to be combined with at least some carbon dioxide removal (CDR) from the atmosphere. Given the risks, costs and uncertainties associated with technology-based CDR solutions, such as bioenergy with carbon capture and storage (BECCS), a safer and much more feasible way to store carbon is by increasing the natural sinks through the restoration of terrestrial and marine ecosystems.

RESTORATION OF CARBON AND SPECIES-RICH ECOSYSTEMS IS AMONG THE CHEAPEST AND QUICKEST NATURE-BASED CLIMATE MITIGATION MEASURES

A recent joint report[5] by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC) finds that ambitious land- and ocean-based actions to protect, sustainably manage and restore ecosystems offer co-benefits for climate mitigation, climate adaptation and biodiversity objectives. They can also help keep temperature rise within the limits envisioned by the Paris Agreement, provided that such actions support, and are not in lieu of, ambitious reductions of emissions from fossil fuels and land use change.



The IPBES-IPCC report identifies restoration of carbon and species-rich ecosystems as among the cheapest and quickest nature-based climate mitigation measures. It not only offers much-needed habitat for plants and animals, thus enhancing the resilience of biodiversity in the face of climate change, but also carries benefits like flood regulation, coastal protection, enhanced water quality, reduced soil erosion and boosted pollination. The report also shows that ecosystem restoration can create jobs and income, especially when taking into consideration the needs and access rights of indigenous peoples and local communities.

How can nature restoration benefit the climate?

Forests are by far the largest terrestrial carbon stores, but deforestation and forest degradation account for as much as 11% of global greenhouse gas emissions. In Europe, forests may be increasing in area, but their health is deteriorating[6] and their ability to absorb carbon from the atmosphere is decreasing.

Natural, biodiverse forests that contain trees of different species and age store more carbon and are more climate-resilient than other forests in similar climate conditions. Combined, passive restoration – halting logging and letting forests mature so that they can recover old-growth – and active restoration of forests to a more natural state,

by removing non-native species and promoting deadwood and veteran trees, are an effective win-win strategy for biodiversity conservation and carbon dioxide removal and storage, and they improve forests' resilience to the impacts of climate change.[7]

CASE STUDY 1

Boreal forests in Finland

The natural boreal forests in southern and western Finland are an important carbon sink. Over the years, however, commercial forestry has turned nearly a quarter million hectares of them into uniform areas that lack trees of different age, have very little dead wood or forest clearings, and are relatively uninhabitable for most species.

In 2003, Metsähallitus, a state-owned environmental enterprise, selected 33 sites stretching across 6,000 hectares with the aim of recreating some of the lost natural forests[8]. The LIFE-funded restoration work focused on planting trees of different ages, creating an abundance of decaying wood on the ground and allowing occasional openings in the forest canopy while reducing fragmentation.

In mature forests, trees were burned to increase the volume of deadwood and create habitats for endangered beetles and other fire- and deadwood-associated species. Small openings were also made to encourage a more varied age structure of the tree stock, and in young forests, the project cleared or thinned large clumps of trees around deciduous trees to accelerate their growth. These measures benefited the white-backed woodpecker, which breeds in well-lit deciduous forest and feeds on insect larvae that live in decaying wood.

Scientific research carried out since the end of the project clearly demonstrates the efficiency of the burning activity in restoring and enhancing the natural properties of pine-dominated forests that have been previously used for timber production. Today, all of the project sites are still protected by law. With no forestry allowed, the forests are now developing naturally, benefitting both climate and local biodiversity.

Organic matter decays very slowly in water-saturated soils, making **peatlands** – a type of wetland in which plant material never fully decomposes – the most efficient land-based carbon store. Undisturbed, peatlands can store carbon nearly infinitely, but humans have already drained 15% of them worldwide, mainly for cropland, grazing and forestry. As a result, though they only cover 0.4% of the global land surface, their destruction accounts for some 5% of all global anthropogenic greenhouse gas emissions.[9]

The EU is the world's second largest emitter of greenhouse gases from drained organic soils, behind only Indonesia – accounting for 15% of all emissions caused by peatland degradation.[9] Prioritising large-scale restoration of peatlands would, therefore, carry immense benefits for nature and climate. Fortunately, emissions from drained organic soils can rather easily be reduced and even stopped by restoring the water table to pre-drainage levels.[9]

THE EU IS THE WORLD'S SECOND LARGEST EMITTER OF GREENHOUSE GASES FROM DRAINED ORGANIC SOILS

CASE STUDY 2

Peat Restore

A LIFE funded project is reducing emissions by restoring degraded peatlands in five European countries. Peat Restore[10], coordinated by the German environment association NABU, brings together partners from Poland, Germany, Estonia, Latvia and Lithuania to rewet degraded peatlands in an area that's become an emissions hotspot.

Since 2016, more than 4,000 hectares of peat have been rewetted, and an additional 1,200 hectares will be restored before the project's wrap up in 2021. To raise the water levels, the partners constructed dams and filled drainage ditches with degraded peat and vegetation. Bushes and trees that absorb a lot of water were removed, and some sites are trialing using peat moss (Sphagnum) to promote the production and accumulation of peat.

When all the sites are restored, the project estimates a 25% reduction in emissions compared to before the works began.[11] Though further evaluation is required, the preliminary results show that peatland restoration has a significant positive contribution to climate change mitigation.

Beyond restoration, the project also aims to raise awareness about biodiversity in these unique ecosystems, which are home to migratory birds and rare plant species highly adapted to the wet conditions, like the fen orchid *(Liparis Loeselii)*. To this end, flora and fauna have been mapped and monitored.

The ocean absorbs approximately a quarter of the global CO2 emissions, and **marine sediments** are the largest pool of organic carbon on the planet. Coastal ecosystems, like seagrasses, salt marshes and mangroves, meanwhile, can store carbon at rates two to four times higher than mature tropical forests[12]. Better protecting and restoring life below water and around coastal regions can only reinforce the ocean's capacity as a 'blue carbon sink'.

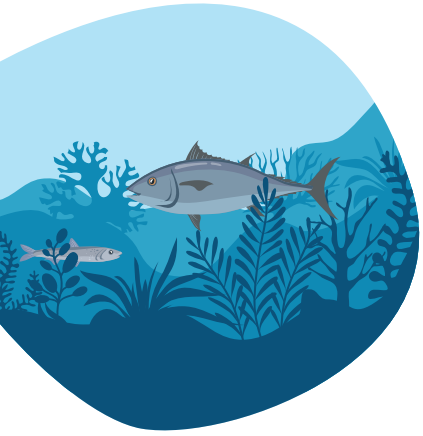
CASE STUDY 3

Passive restoration of marine sediments

Bottom trawling is a widespread practice that consists of dragging heavy fishing nets along the seabed. The process disturbs marine sediments, which are the largest pool of organic carbon on the planet and a crucial reservoir for long-term storage.

Left undisturbed, marine sediments can store carbon for thousands of years, but bottom trawling causes them to release the carbon into the water. This in turn increases ocean acidification, reducing its buffering capacity, and can contribute to the build-up of CO2 in the atmosphere.

A recent study[13], published in Nature, identifies places where establishing marine protected areas (MPAs) and promoting passive restoration would have the greatest climate mitigation impact. Areas with large carbon sinks that are heavily impacted by bottom trawling, such as Europe's Atlantic coast, were found to have the greatest potential. Creating effectively managed protected zones in Europe's seas and promoting their passive restoration will help bring back ocean biodiversity and its ability to store carbon.

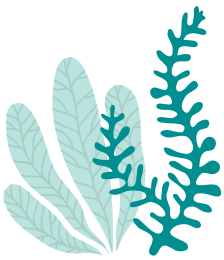


Seagrasses occupy less than 0.1% of the seafloor but they are responsible for 10-18% of total ocean carbon storage[14]. Healthy seagrass meadows help prevent coastal erosion and protect coastal communities from flooding and storm surges.

Because they are one of the most productive ecosystems on Earth, seagrasses are also frequently referred to as 'ecosystem engineers'. A single hectare of seagrass meadow can harbour up to 80,000 fish and 100 million invertebrate species. Seagrass habitat is vital for fishing communities across the globe, providing nurseries for species of commercial and ecological importance.

CASE STUDY 4

Active restoration of seagrass



Once surrounded by them, the UK has lost up to 92% of its seagrass meadows due to pollution, damaging fishing and boating practices, and coastal development. WWF-UK has been working with partners[15] to protect remaining seagrass habitats and address the main causes of their decline in what is the UK's largest seagrass restoration programme to date[16].

Starting at a pilot site in Dale, on the Pembrokeshire Coast in West Wales, the

project has planted 1.2 million seagrass seeds to restore 2 hectares of seagrass meadow, demonstrating the feasibility of the restoration model. Stakeholder engagement is a crucial element of the project, with a community group established to co-create and sustainably manage the restoration area into the future. To deliver benefits at scale, partners are also trialing mechanising each stage of the restoration process, which will make it more cost-efficient and is essential to enabling the scale-up from handfuls to hundreds of hectares per year.

The project aims to create a blueprint for the large-scale restoration of seagrass and other coastal habitats in the UK – which will enhance biodiversity, support climate-smart fisheries, protect coastlines and communities, and re-establish a huge source of carbon storage.

Coastal sand dunes are key to climate adaptation, as they provide natural safety barriers against marine flooding and storms, protecting local communities from coastal flooding and structural damage. They are also an incredibly rich reservoir of biodiversity.

CASE STUDY 5

Dune resilience

Across the coastal regions of northern France and southern England, climate change is causing sea levels to rise and annual land loss of up to 15km² due to erosion. Today, at least 70 million people living along the North Sea's southern shore and the English Channel find themselves at high risk of flooding.

The region has the longest stretch of coastal dunes in Europe, and from 2014 to 2020, the EU-funded Endure project[17] aimed to improve them to act as "adaptive, living sea defences" with greater resilience to climate change impacts.

The project tested affordable and durable ecosystem-based methods to improve dune resilience. If proven effective, these alternatives to traditional engineering solutions, such as concrete sea walls, could generate savings of around EUR 314 million.

One method reduced erosion by trapping sand inside layers of netting near the sea bed, creating sand deposits that will build up the beach and protect or nourish the dunes. A one-year pilot proved effective, meeting all its objectives, so the partners are now extending it to larger-scale sites to confirm the method's effectiveness. At other sites, the project tested farming mussels on poles drilled into the shoreline to reduce wave erosion and encourage dune nourishment.

The project also explored how ecosystem-based solutions could be applied before significant erosion damage occurs, including through hedge fencing and recycled boardwalks, and raised awareness among local communities about the benefits of adaptive dune systems.

Conclusion

Nature restoration encompasses more than just EU biodiversity objectives. An ambitious law with binding nature restoration targets that delivers ecosystem restoration at scale and prioritises carbon rich ecosystems is also crucial to achieving the EU's 2030 targets and its 2050 climate neutrality objective, when paired with rapid and ambitious reductions of emissions from fossil fuels and land use change.

Restoring ecosystems to a natural state will enable them to absorb and store more CO_2 and will increase our resilience to the impacts of climate change by offering protection against the increasing occurrence of severe weather events like flooding and droughts. And last but not least, large-scale nature restoration will preserve and replenish Europe's biological diversity of animal and plant species.

As such, investment in nature restoration is really an investment in addressing the twin crises of biodiversity loss and climate change, benefiting people and the planet.

References

1 UNEP. (2020). Preventing the next pandemic - Zoonotic diseases and how to break the chain of transmission. United Nations Environment Programme and International Livestock Research Institute, Nairobi, Keyna. <https://www.unep.org/resources/report/preventing-future-zoonoticdisease-outbreaks-protecting-environment-animals-and>.

EEA. (2020). Healthy environment, healthy lives: how the environment influences health and well-being in Europe. European Environment Agency, Copenhagen, Denmark. <https://www.eea.europa.eu/publications/healthy-environment-healthy-lives>.

2 IPBES. (2019). Global assessment report on biodiversity and ecosystem services: Summary for policymakers. IPBES secretariat, Bonn, Germany <https://ipbes.net/sites/default/files/2020-02/ipbes_global_assessment_report_summary_for_policymakers_en.pdf>.

3 EEA. (2020). State of nature in the EU. European Environment Agency, Copenhagen, Denmark. <https://www.eea.europa.eu/publications/state-ofnature-in-the-eu-2020>.

4 Joint #RestoreNature statement (2023). <https://www.restorenature.eu/en/our-work-past-actions/joint-restorenature-statement>.

5 IPBES and IPCC (2021). Scientific outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change. IPBES secretariat, Bonn, Germany. <https://zenodo.org/record/5101125#.YQOnpugzZPY>.

6 Maes, J., Teller, A., Erhard, M., Condé, S., Vallecillo, S., Barredo, J.I., Paracchini, M.L., Abdul Malak, D., Trombetti, M., Vigiak, O., Zulian, G., Addamo, A.M., Grizzetti, B., Somma, F., Hagyo, A., Vogt, P., Polce, C., Jones, A., Carré, A., Hauser, R. (2021). EU Ecosystem Assessment: Summary for policymakers. Publications Office of the European Union, Luxembourg. <https://op.europa.eu/en/publication-detail/-/publication/81ff1498-b91d-11eb-8aca-01aa75ed71a1/language-en>.

7 Sabatini FM, Keeton WS, Lindner M, et al. (2020). Protection gaps and restoration opportunities for primary forests in Europe. Diversity and Distributions: A Journal of Conservation Biogeography 26(12). <https://onlinelibrary.wiley.com/doi/full/10.1111/ddi.13158>.

8 Metsähallitus. (2007). Restoration of boreal forests and forest-covered mires. LIFE Public Database, Reference LIFE03 NAT/FIN/000034. <https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=2485>.

9 Barthelmes, A (ed.). (2018). Reporting greenhouse gas emissions from organic soils in the European Union: challenges and opportunities. Policy brief. Proceedings of the Greifswald Mire Centre. <https://greifswaldmoor.de/files/dokumente/GMC%20Schriften/18-02_Barthelmes_GMC.pdf>.

10 LIFE Peat Restore. (2021). LIFE Peat Restore website. <https://life-peat-restore.eu/en/>.

11 Based on the results of applying the Greenhouse Gas Emission Site Types (GEST) method.

12 Murray, B. C., Pendleton, L., Jenkins, W.A., Sifleet, S. (2011). Green Payments for Blue Carbon: Economic Incentives for Protecting Threatened Coastal Habitats. Nicholas Institute for Environmental Policy Solutions. Duke University. <https://nicholasinstitute.duke.edu/sites/default/files/publications/blue-carbon-report-paper.pdf>.

13 Sala, E., Mayorga, J., Bradley, D. et al. (2021). Protecting the global ocean for biodiversity, food and climate. Nature 592, 397–402. <https://doi.org/10.1038/s41586-021-03371-z>.

14 Fourqurean, J., Duarte, C., Kennedy, H. et al. (2012). Seagrass ecosystems as a globally significant carbon stock. Nature Geosci 5, 505–509. <https://doi.org/10.1038/ngeo1477>.

15 Project Seagrass. (2021). Seagrass Ocean Rescue. <https://www.projectseagrass.org/seagrass-ocean-rescue/>.

16 Sky Ocean Rescue, Project Seagrass and the University of Swansea

17 ENDURE. (2021). ENsuring DUne REsilience against Climate Change project website. <https://www.interreg2seas.eu/en/endure>.

This publication is co-funded by the European Union.

FOR MORE INFORMATION:

Sabien Leemans
Senior Policy Officer for Biodiversity
sleemans@wwf.eu

Ola Miklasińska
Communications Officer for Biodiversity
amiklasinska@wwf.eu