



BiodivRestore call text

The Funding Organisations in the BiodivERSA and the Water JPI networks have joined efforts to organise and fund a

International call for transnational research proposals on

“Conservation and restoration of degraded ecosystems and their biodiversity, including a focus on

(1) Context

Many of the world's ecosystems have undergone significant degradation with negative impacts on biological diversity and people's livelihoods. Protecting nature can be a very effective tool to prevent further loss of biodiversity. However, there is a growing realization that we will not be able to conserve the earth's biological diversity and meet the United Nation Sustainable Development Goals (UN SDGs) through nature protection efforts only. For instance, the recent IPBES assessment on land degradation and restoration¹ highlighted that “land degradation is a pervasive, systemic phenomenon that occurs in all parts of the terrestrial world and that can take many forms”. The assessment report stressed the need to urgently combat land degradation and to restore degraded land if we want to protect biodiversity and the ecosystem services it provides. The importance of conservation and restoration to safeguard biodiversity applies to all ecosystems in terrestrial, freshwater as well marine environments.

At the European level, despite ambitious targets, Europe continues to lose biodiversity at an alarming rate and many agreed policy targets will not be achieved by the end of 2020². Assessments of species and habitats protected under the Habitats Directive show predominantly unfavourable conservation status for 60% for species and 77% for habitats. Biodiversity loss is not confined to rare or threatened species. For example, water ecosystems and wetlands are not on track to reach good ecological status by 2030 as the hydro-morphological pressures continue to deteriorate. Yet, the aquatic ecosystems as defined in the European Policy (rivers, lakes, transitional and coastal waters, but also wetlands and floodplains found in proximity of surface water or depending of groundwater) are providing important regulating ecosystem services (such as water purification, carbon capture and storage, and flood protection), in addition to providing habitats for many protected species. Similarly, the monitoring of populations of common bird and butterfly species over Europe also demonstrated strong biodiversity erosion, for instance in farmlands.

This is why the newly adopted Green Deal³ (Van der Leyen Commission, November 2019), as a response to this and related challenges, contains the recently launched EU Biodiversity Strategy for 2030⁴. The new Strategy proposed a transformative plan to tackle the biodiversity crisis by protecting

¹ IPBES (2018): The IPBES assessment report on land degradation and restoration. Montanarella, L., Scholes, R., and Brainich, A. (eds.). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 744 pages. <https://doi.org/10.5281/zenodo.3227392>

² European Environment Agency, European Environment 2020 Outlook

³ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁴ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS EU



and restoring nature, including through improving and widening the existing network of protected areas and by developing an ambitious EU Nature Restoration Plan for ecosystems across sea and land. The Strategy addresses the five main drivers of biodiversity loss and builds around a simple headline commitment: by 2030, Europe's biodiversity is on the path of recovery for the benefit of people, the planet and our economy.

Similarly, the UN Decade on Ecosystem Restoration⁵ (2021 to 2030), declared in March 2019 by the UN General Assembly, aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight the climate crisis and enhance food security, water supply and biodiversity. Indeed, conservation and restoration of degraded ecosystems in terrestrial, freshwater and marine environments are essential to ensure that they can continue to deliver their services and that the livelihoods of people depending on these ecosystems can be sustained.

Given the above, research is needed at pan-European level to ensure the effective conservation and restoration of all ecosystems and the different facets of their biodiversity whilst meeting the socio-economic, political and cultural needs of current and future generations. Such research would feed the implementation of the new EU Biodiversity Strategy for 2030; the EU Habitats Directive⁶; the EU Water Framework Directive for implementing integrated river basin management for Europe⁷ (with its daughter directives: Groundwater Directive, Priority Substances Legislation); the Marine Strategy Framework Directive⁸; the EU Soil Strategy; the Forest Strategy; and several others. It will also contribute to other sectoral policies such as the Common Agricultural Policy (CAP) of which three out of the nine “specific objectives” concern climate and the environment (including fostering sustainable development and efficient management of natural resources such as water and soils). Such research will also support Europe's leadership and endeavours to implement many UN SDGs, especially SDG 6 (‘Clean water and sanitation’), SDG 13 (‘Climate Action’), SDG 14 (‘Life below water’) and SDG 15 (‘Life on land’).

This call aims to support transnational research projects (3-years duration) addressing issues helping to understand processes for conservation and restoration of degraded ecosystems. The call includes a specific focus on aquatic ecosystems but **all environments can be considered**, i.e. marine, freshwater and terrestrial – including urban. Proposals can focus on only one environment; proposals comparing different environments or studying links between environments (e.g. terrestrial-aquatic) are particularly welcomed.

For this call the following definitions are retained:

- **Biodiversity** is defined as “the variability among living organisms from all sources including, inter-alia, terrestrial, marine and their aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems” (United Nations Convention on Biological Diversity, 1992⁹).
- **Conservation** means ensuring that the arrays of ecosystems are maintained, and that species, populations, genes, the complex interactions between them as their evolutionary potential, persist

Biodiversity Strategy for 2030 Bringing nature back into our lives (COM/2020/380 final), <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590574123338&uri=CELEX%3A52020DC0380>

⁵ <https://www.decadeonrestoration.org/>

⁶ https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

⁷ https://ec.europa.eu/environment/water/water-framework/index_en.html

⁸ https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

⁹ <https://www.cbd.int/>

into the future, considering the intrinsic value of biodiversity and maintaining its potential to meet the needs and aspirations of future human generations¹⁰.

- **Restoration** is the support to the recovery process of ecosystems degraded by anthropogenic disturbances towards a dynamic stable state, aiming at either the return of habitats to a natural state (rewilding) or a state similar but not the same to the state existing before restoration. For this call, both **'active' restoration** (implying pro-active action of humans, often through some kind of ecological engineering) and **'passive' restoration** (halting/decreasing pressures on the ecosystems and letting the natural dynamics of biodiversity do the job) will be considered^{11,12}.
- **Degraded ecosystems** means ecosystems in a state that results from persistent decline or loss of **biodiversity and ecosystem functions and services that cannot fully recover unaided**¹³.
- **Ecosystem services** are processes by which the environment produces benefits useful to people, akin to economic services. They include provision of clean water and air, pollination of crops, mitigation of environmental hazards, pest and disease control, and carbon sequestration¹⁴.
- **Transdisciplinarity**: Though several definitions of transdisciplinarity coexist, the definition used here is the involvement of stakeholders at the different stages of the project where relevant, for instance to define research objectives and strategies, facilitate inputs from non-academic stakeholders, better incorporate the diffusion of learning produced by the research of learning produced by the research and facilitate a systemic way of addressing a challenge.

All proposals will need to **quantify the outcomes and/or trajectories** of the conservation/restoration approaches using clear indicators and/or descriptors of biodiversity and, when relevant, ecosystem functions and services, over a time scale from years up to decades.

Projects comparing different approaches for restoration (e.g. passive and active) and conservation will be particularly welcomed, including approaches like the creation of new terrestrial or aquatic ecosystems.

Projects **may cover a broad range of methodological approaches** (experimentation, data analysis from observations and monitoring, modelling, scenarios, quantitative and qualitative social science methods, participatory processes, or a combination of these). Preference will be given to projects that will seek to inform strategy and actions contributing to the achievement of major international policy goals (e.g. the global Aichi targets set in the Strategic Plan for Biodiversity 2011-2020 as well as the new targets to be determined under the post-2020 Global Biodiversity Framework; UNFCCC Paris Agreement goals; UNCCD land degradation neutrality and UN Sustainable Development Goals) and regional policy goals (in particular EU policies and Directives listed above, targets of the EU Biodiversity Strategy to 2030). Research projects should thus provide information that will inform policy makers, authorities, institutions and practitioners concerned with decision-making, planning, designing and managing a broad range of environments and outreach to society. More generally, applicants should consider how the knowledge they will produce can be scaled up or generalized beyond limited studied location(s), and disseminated in outreach actions in order to maximize expected societal impact.

¹⁰ Glossary from the CBD : <https://www.cbd.int/cepa/toolkit/2008/doc/CBD-Toolkit-Glossaries.pdf> See also http://www.wwf.org.au/our_work/saving_the_natural_world/what_is_biodiversity/conserving_biodiversity/

¹¹ Holl K. 2020. Primer on ecosystem restoration. Island Press

¹² Gann, G. D., T. McDonald, B. Walder, J. Aronson, C. R. Nelson, J. Jonson, C. Eisenberg, et al. 2019. International Principles and Standards for the Practice of Ecological Restoration. Washington, DC: Society for Ecological Restoration

¹³ IPBES Glossary: [https://ipbes.net/glossary?combine=conservation&f\[0\]=title_az_glossary%3AL](https://ipbes.net/glossary?combine=conservation&f[0]=title_az_glossary%3AL)

¹⁴ Glossary from the CBD : <https://www.cbd.int/cepa/toolkit/2008/doc/CBD-Toolkit-Glossaries.pdf>

This programme covers both continental and insular areas. Research on insular systems such as those of the Outermost Regions (ORs) and Overseas Countries and Territories (OCTs) participating in this call will be of particular interest.

The intention of this joint BiodivERsA / the WATER JPI call co-funded by the European Commission is to support research projects in which the approaches and skills of **natural sciences, social sciences and humanities** are integrated as needed to address the specific objectives of each research proposal. This call also aims at funding **transdisciplinary research** projects demonstrating potential societal and policy impact. In this context, the participation of stakeholders (public and private) in research proposals is welcome.

Applicants are invited to submit **proposals dealing with at least one of three themes outlined below**. Projects can address one theme or more. Projects combining aspects from two or more of the below mentioned themes are encouraged.

(2) Priorities of the call

THEME 1: STUDYING THE BIOLOGICAL AND BIOPHYSICAL PROCESSES AT STAKE FOR CONSERVATION/RESTORATION, AND THEIR INTERACTIONS

Research addressing Theme 1 should contribute to the following aspects:

- What is the **role of different biodiversity dimensions** (species diversity, functional -including trophic- diversity, ecosystem diversity, genetic diversity) **for conservation and restoration**?
- What is the **relationship between ecosystem functioning** (including biogeochemical cycle and ecosystem resilience) **and biodiversity during conservation and restoration** processes of degraded ecosystems? In particular, what is the relationship between biodiversity and resilience, and how can restoration increase the resilience of biological communities and ecosystems? Are there tipping points for degraded ecosystems and biodiversity beyond which restoration is no longer possible?
- What is the **importance of timescale for assessing and understanding post- versus pre-conservation/restoration trajectories**? This notably includes better understanding of evolutionary effects of conservation and restoration by, e.g., applying evolutionary principles to inform ecological restoration actions. This also includes understanding the importance of legacy effect for conservation and restoration approaches (i.e. to what extent the status of biodiversity and ecosystems before restoration influences the outcome of restoration actions?).

THEME 2: ASSESSING TRADE-OFFS AND SYNERGIES BETWEEN TARGETS, BENEFITS AND POLICIES FOR CONSERVATION AND RESTORATION

Research addressing theme 2 should contribute to help proposing quantitative and qualitative targets for conservation and restoration in support to integrated policies and management or practices on the ground. This notably covers the following aspects:

- Analysing **trade-offs and synergies between targets of conservation / restoration measures** (different biodiversity facets, different ecosystem functions and services). Research could contribute to answer questions like: how conservation and restoration can tackle specific challenges (e.g. regulation of climate change, regulation of the effects of hydro-climatic extreme events; control of zoonoses & diseases; etc., in addition to improved biodiversity status), keeping in mind that some services can be delivered outside the conserved or restored areas? Which aspects of biodiversity and ecosystem should be conserved/restored depending

on the targets aimed at? To what extent can the development of novel ecosystems be a valuable approach to restoration in a changing world¹⁵?

- **Assessing (quantitative and qualitative) social and economic benefits and costs (incl. co-benefits and conflicts) of conservation/restoration approaches.** This notably includes developing indicators that are suitable to evaluate conservation and restoration actions and their success (linked to different targets as discussed above). This also includes assessing the costs-to-benefits effectiveness of restoration approaches, highlighting the co-benefits (not only economic) and possible conflicts between different sectors of society or social groups. For instance, who pays for and who benefits from conservation and restoration actions? Research projects can also evaluate the time scale under which the benefits occur and the implications for, e.g. payment schemes for restoration approaches.
- Developing **integrative socio-ecological approaches** (incl. governance systems and new decision-making tools) to understand the benefits and risks associated to conservation/restoration measures and predict their outcomes. This includes assessing which restoration practices, management actions or policies are efficient and which are not. Research studying the importance of involving stakeholders, including the link to local communities, and the impacts of policy incentives (including perverse ones) would be welcome. This could include modelling socio-ecological systems in order to better understand and predict the outcomes of conservation and restoration and how to connect policy and social processes to ecological processes. Research addressing new decision-making tools that could help reach the goals of conservation and restoration (incl. scenarios as a support for decision making) and new institutional approaches to restore degraded ecosystems can be considered. The ambition would be to integrate biophysical, social, economic and governance drivers. Projects contributing to a better understanding of how behaviours and behaviour changes can be accounted for in conservation and restoration projects, and how conservation/restoration projects can be used as a tool for transformative change towards more sustainable socio-ecosystems and better biodiversity status would also fall under the scope of this theme.

THEME 3: KNOWLEDGE FOR IMPROVING THE EFFECTIVENESS AND UPSCALING OF CONSERVATION AND RESTORATION ACTIONS

Research under theme 3 should cover the following aspects:

- **Upscaling of processes to landscapes or regions and across gradients.** This could cover the following research questions: What are the drivers of effective conservation restoration approaches at different scales (e.g. landscape; catchment; city; etc.)? Which approaches are efficient to scale up conservation and restoration (including land-, river- & sea-scape restoration)? Projects could also provide knowledge informing spatial planning to properly upscale (incl. conserving and restoring ecological networks, increase efficiency of meta-populations and meta-communities...). They could help answering questions like: Is a prioritization needed when conserving/restoring depending on scale? When do conservation and restoration approaches become functional/efficient and have wider effect at large scale?
- **Integrating conservation and restoration approaches for improving their effectiveness.** This could include: How restored biological communities/ecosystems work as compared to the ones that were conserved? Can we reach the same state with restoration as with conservation? Can the speed of restoration be increased by combining conservation and restoration approaches over a given area?
- **Evaluating and considering uncertainties** associated to conservation and restoration approaches **for developing adaptive management.**

¹⁵ Prober et al. (2018) Shifting the conservation paradigm: a synthesis of options for renovating nature under climate change. Ecol. Monogr. doi/full/10.1002/ecm.1333

(3) Expected impacts and international added value

The richness and specificities in various places and regions mean that it is necessary to understand the details of local biodiversity, ecosystems and socio-cultural conditions if we are to develop a robust framework for action regarding conservation and restoration. However, research to be funded through this joint Biodiversa / WATER JPI call supported by the European Commission will have to **go beyond single study cases**. The physical, biological and social processes associated with conservation and restoration approaches take place at a range of spatial scales, from the local to regional and global. Therefore, a sufficient understanding of the spread and connection of these processes cannot be revealed by research at a single local site, but rather relies on studies at multiple sites and scales. These in turn need to take explicit account of the ways in which processes at one scale drive or constrain processes at one or more other scales, and how results obtained at one or a few sites are specific to these locations but also include generalities that apply across many places. A robust understanding of conservation and restoration processes is thus most efficiently and effectively developed through transnational collaboration. In addition, the contemporary situation of vast regional interactions/teleconnections often requires to take into account the global context.

In term of methods, transnational collaboration in model development and the inter-comparison of different models is one of the approaches to be supported to advance research on conservation and restoration processes. Learning and information sharing is also key to social adaptation. Therefore, project participants will benefit from a collaborative approach to the problem.

As usual, it is expected that applicants will explicit the novelty of their work and how it adds to the existing knowledge base, including previously funded, ongoing projects. Large overlap with on-going international, European and national projects on this theme should be avoided. Complementing on-going research is however possible but should be clearly explained.

Applicants are encouraged to use existing resources and infrastructures for their project, including the data and information from the Copernicus programme, and the existing biodiversity research infrastructures (listed in the Biodiversa report mapping of biodiversity research infrastructures (to be published soon)).