

Short Term Action Plan on Ecosystem Restoration Group of activities A: Assessment of opportunities for Restoration

Biodiversity considerations in the context of restoration science and practice

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The assessment phase of restoration planning offers an opportunity to consider and prioritize degraded lands for restoration action, to engage indigenous peoples and local communities^{1,2}, to consider gender balance³⁻⁶ and to assess the potential of restoration as a tool for addressing a wide variety of ecological and social issues. An effective approach to initial planning can help prevent potential challenges at later stages of implementation while simultaneously enhancing restoration opportunities. Assessing the potential of ecosystem restoration to promote biodiversity objectives raises a number of challenges and opportunities. The following considerations can be useful:

Avoid unintentional damage to natural ecosystems [A1, A2, A3]

Damage to ecosystems, whether unintentional or through conversion to another ecosystem type, should be avoided to prevent negative effects on biodiversity. This consideration is reflected in the Annex to the STAPER*, but also in other policy frameworks relevant for

* See the 'Guidance for integrating biodiversity considerations' section in appendix I of Decision CBD COP XIII/5

restoration such as REDD+[†], the International Standards for Ecological Restoration⁷, and Principles of Forest and Landscape Restoration[‡].

This risk may occur when projects use afforestation, that is, the planting of trees in non-forest native ecosystems, such as grasslands, even if those non-forested ecosystems are in a degraded state. These often-overlooked native ecosystems typically contain significant biodiversity⁸. Global maps of restoration opportunities based largely on potential forest vegetation could inadvertently lead to the afforestation of biodiverse grasslands, savannas, and open canopy woodlands. In most cases, these maps were only intended to provide a general idea of where restoration could be considered. Assessments of restoration opportunities should always be scaled-down appropriately to national or local level, drawing on expert knowledge. ROAM and other assessment frameworks (e.g., Chapter 8.2.2 of IPBES 2018⁹) may be useful in this regard.

Account for all potential ecosystem benefits of restoration [A4]

Focusing exclusively on the delivery of one ecosystem service, such as carbon, should be

[†] A set of seven safeguards were adopted in Decision UNFCCC 1 / CP.16 with the aim of avoiding risks from REDD+ implementation. One of the safeguards states that in the execution of REDD+ activities (which may include the enhancement of carbon stocks through forest restoration), the conversion of natural forests should be avoided.

[‡] The Global Partnership on Forest and Landscape Restoration has developed principles to establish a common understanding on forest and landscape restoration and guide the efforts of its members, one of which states that "FLR does not lead to the conversion or destruction of natural forests or other ecosystems." ; see Besseau, P., Graham, S. and Christophersen, T. (eds.). (2018) Restoring forests and landscapes: the key to a sustainable future. Global Partnership on Forest and Landscape Restoration, Vienna, Austria.
http://www.forestlandscaperestoration.org/sites/forestlandscaperestoration.org/files/resources/GPFLR_FINAL%2027Aug.pdf

avoided. Focusing on a single benefit may reduce the restoration potential in a landscape or may lead to a project design that either does not optimise recovery of biodiversity or could cause biodiversity degradation.

To avoid this, assessments should consider multiple benefits, such as increased agricultural productivity or carbon storage together with biodiversity outputs^{1,10-12}.

Depending on goals, restoration interventions can be selected and prioritised^{16,17}. In many cases, projects can deliver multiple benefits and are more productive. As examples:

- diverse restoration plantings have been shown to store more carbon than in mixed native/commercial systems or monocultural plantations in Australia¹³,
- placing natural wood back in streams in temperate forests both benefits biodiversity and greatly increases ecosystem services¹⁴, and
- in China, indigenous species can recover soil microbial biomass faster than exotic species, thus demonstrating that increasing biodiversity and improving soil health can work in synergy¹⁵.

Another way to reduce potential harm to biodiversity is to employ best practices for the use of scenarios in restoration planning, including¹⁸:

- 1) using a multi-stakeholder participatory process,
- 2) defining targeted restoration outcomes,
- 3) defining methodological choices,
- 4) encouraging the consideration of the interaction among variables;
- 5) identifying the scenarios that maximize benefits while minimizing costs and resistance for multiple targets, and
- 6) promoting capacity building.

Four principles to guide tree planting schemes focused on carbon storage and commercial forestry in the tropics have also been proposed¹⁹:

- 1) restoration interventions should enhance local livelihoods;

- 2) afforestation should not replace native tropical grasslands or savanna ecosystems;
- 3) reforestation approaches should promote landscape heterogeneity and biological diversity; and
- 4) residual carbon stocks should be distinguished from newly established carbon stocks.

Consider the optimal location of restoration on the landscape [A2, A6]

The assessment phase also provides opportunities for the optimal placement of restoration interventions on the landscape to maximize positive outcomes for biodiversity. For example, planning restoration projects on low-productivity lands adjacent to protected areas can have significant biodiversity benefits, whether the project involves restoration of a native ecosystem or restoration of agricultural productivity through agroforestry or other mixed systems^{20,21}. Restoration can also be used to re-establish connectivity between protected areas or other remaining native habitat, especially through the management and creation of corridors²². Corridors are more effective and efficient if designed for multiple species²³, and a recent meta-analysis found that positive benefits of corridors, such as facilitating dispersal and increasing native diversity, are greater than the small and manageable negative effects they may have²⁴.

Establish baselines [A6]

One of the most complex aspects of ecosystem restoration planning is the collection of baseline data that will inform the targets of restoration⁷. A baseline can be developed by comparing current site conditions to potential or historical vegetation using resources such as the Potential Natural Vegetation of Eastern Africa²⁵, or the Atlas of Living Australia²⁶. Some European research also explores the determination of baselines in the context of degrees of degradation and how this might influence restoration targets^{27,28}.

An effective assessment phase is the first step towards implementing successful restoration programs that will achieve ecological, economic, and social benefits for all stakeholders.

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