


## UN DECADE ON ECOSYSTEM RESTORATION

### POLICY ARTICLE

# Upscaling ecological restoration: toward a new legal principle and protocol on ecological restoration in international law

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The United Nations Decade of Ecosystem Restoration is an opportunity for States to advance the development of substantive and qualitative international law obligations for conducting restoration activities. This will help countries move beyond the more quantitative target-driven approach that currently focuses international commitments on the percentage of degraded areas that have to be restored. In this paper, we argue for two pathways for States to accelerate and pursue international obligations to undertake ecological restoration. Firstly, we advocate for the development of a new international legal principle on ecological restoration, adding to existing international environmental law principles such as the prevention principle, and aiming at achieving the highest level of recovery possible. Secondly, we advocate to utilize available mechanisms through the 1992 Convention on Biological Diversity and create a new protocol that will spell out a high ambition level for ecological restoration and a legal basis for adopting generally accepted rules and standards for restoration. The voluntary SER Principles and Standards can play an important role in the development of the legal principle on ecological restoration and standards of best practice.

**Key words:** Convention on Biological Diversity, legal principles, performance standards, principle on ecological restoration, protocol on restoration, SER Principles and Standards

#### Implications for Practice

- Legal tools including a regulatory mix of rules, principles, and standards should be used to upscale ecological restoration.
- A new international legal principle on ecological restoration should be recognized, adding to existing international environmental law principles, such as the prevention principle, to move beyond purely quantitative targets on restoration.
- The development of a new protocol to the Convention on Biological Diversity on ecological restoration can push ecological restoration forward by creating State responsibility to plan and invest in restoration activities.
- International law should provide a legal obligation to adhere to standards of best practice for ecological restoration.
- SER Principles and Standards can play an important role in developing the legal principle on ecological restoration and standards of best practice.

crystallized in international law and has been codified across several international and regional conventions, the precise content of this legal duty is not always clear (Telesetsky et al. 2017). Instead of clarifying legal expectations, States have set policy targets on ecological restoration such as the Aichi restoration targets under the Convention on Biological Diversity (CBD, 5 June 1992). These predominantly quantitative targets are not legally binding and have not been well-implemented. According to the Global Biodiversity Outlook 5 report, progress on Aichi Target 15 calling for restoration of at least 15% of degraded ecosystems is limited and the target has not been

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#### Introduction

During the past decades, States have witnessed an increase in international, regional, and national legal obligations to achieve ecological restoration. Although a legal duty to restore has

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universally achieved. About 50% of Parties have established national targets toward Aichi Target 15 and included them in their National Biodiversity Strategies and Action Plans. Of these, about 17% meet or exceed the 15% restoration level (Secretariat of the Convention on Biological Diversity 2020). The existence of quantitative targets may unintentionally lead States to pursue strategies to meet short-term targets without fully considering the long-term consequences of certain investment strategies or the creation of unwanted ecological effects.

The United Nations Decade of Ecosystem Restoration (2021–2030) can provide the momentum for the international community to upscale restoration. This article queries how we can use international legal tools to more rapidly scale-up restoration efforts, both quantitatively and qualitatively. We argue for a mindset shift that recognizes the risk involved in delaying policy decisions to enable restoration. Accepting the scientific urgency of implementing best practices to scale up ecological restoration, we focus on how scientific needs can be translated into legal mechanisms. Law provides a variety of tools, including legal rules, principles, and standards, that can be used to compel or encourage better quality and more extensive ecological restoration. We first clarify the differences between legal rules, principles, and standards. We then examine what these could mean for upscaling ecological restoration by arguing for the development of a specific international legal principle on ecological restoration. We also look into what legal role voluntary standards, such as the SER International Principles and Standards for the Practice of Ecological Restoration (Gann et al. 2019) can play in developing an independent legal principle on ecological restoration. In the last section, we examine more concretely how principles and standards can be included within the international legal framework through a Protocol to the 1992 CBD.

### The Need for a High Ambition Level for Restoration and for Ecosystem-Specific Standards of Best Practice for Advancing the Quality of Ecological Restoration

The scale of the current biodiversity and climate crisis underpins the necessity for upscaling ecological restoration (see, e.g. Perring et al. 2018; United Nations Environment Programme 2021). Coordinated implementation of science-based principles and standards for the repair of degraded ecosystems can improve ecological restoration outcomes, increase the cost-effectiveness of restoration measures, and guide all stakeholders involved in the restoration process. Standards of best practice for ecological restoration should focus on diagnostic planning, appropriate timing of interventions, adequate historical knowledge, mitigation of risks associated with particular interventions, and post-intervention monitoring to achieve maximal functional recovery within a degraded ecosystem.

While general principles and standards for ecological restoration already exist (Gann et al. 2019), there is also a need to adopt shared practice standards that are tailored for different ecosystem types and different sectors (public and private sector, e.g. mining sector). Ideally, ecosystem-specific standards of best practice can be developed through the collaboration of

scientists, expert practitioners, and policymakers. The effectiveness of these standards can be further advanced through well-designed monitoring, evaluation, and scientific and experimental research studies. In the absence of shared standards of best practice, many restoration projects and programs will risk underperforming, as has happened when project design has been focused primarily on quantitative targets and quick policy wins.

A good example of the need for ecosystem-specific best practice standards is reflected in certain afforestation and reforestation projects. Although monoculture tree plantations can mitigate soil erosion and desertification, these plantations cannot be considered as forest restoration, as their role for both climate mitigation and biodiversity protection is clearly less than in (restored) natural forests (Lewis et al. 2019). Designing standards of best practice may identify in advance restoration effort conflicts such as those that have emerged in Africa where the planting of fast-growing eucalyptus trees to restore forest cover has been embraced as a popular livelihood development strategy but has also been rejected by some conservation ecologists as failing to achieve ecological restoration objectives (Oballa et al. 2010; Lewis et al. 2019).

Scientific restoration standards can thus help to develop a standardized way to perform restoration by generating relevant best practice requirements. A recurring challenge has been how to conform “scientific quality control” with pressure on political policymakers. Discussed in the next section are some legal tools for bridging gaps between science and policy including rules, principles, and standards.

### A Regulatory Mix of Rules, Principles, and Standards

The benefit of the broader target setting approach, such as the Aichi biodiversity targets, has been the ease with which States have come to incorporate the targets into domestic planning. Although the targets have encouraged States to “restore” degraded land, there is little shared or uniform guidance on what constitutes adequate restoration, including how long a restoration outcome needs to be actively sustained after a restoration intervention. Additionally, the targets are advisory and not obligatory. Any global efforts to scale-up restoration initiatives, such as moving beyond exclusively quantitative targets will require more focused legal rules, principles, and standards to support coherent policy directions.

Figure 1 gives a schematic overview of environmental regulation that consists of a combination of rules, principles, and standards.

A *legal rule* will “prescribe relatively specific acts” (Raz 1972). Rules can include a variety of legal prohibitions directed at a diversity of public and private actors (e.g. a prohibition on harming endangered species) as well as obligations (e.g. a requirement to establish protected areas; an obligation to issue an environmental permit; an obligation to conduct an environmental impact assessment; a requirement to provide financial payments for conservation and restoration measures). Many legal theorists use the idea of *legal standards* in the same way as principles, because both tend to be more open-textured than rules (Braithwaite 2002). However, Braithwaite and

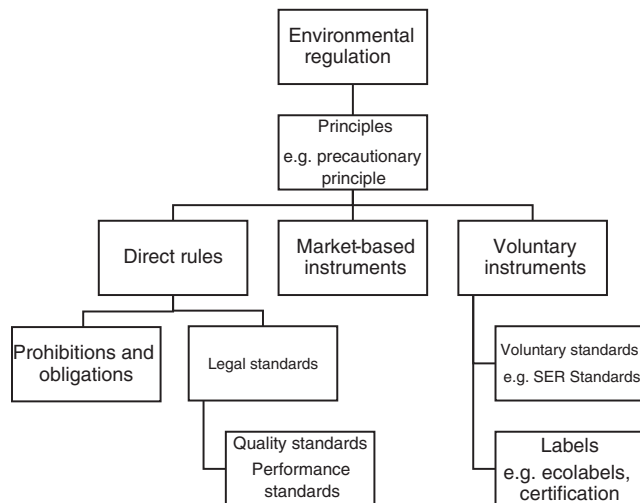


Figure 1. Overview of legal tools in environmental regulation.

Drahos suggest that “Standards are norms that can be applied to measure their performance.” (Braithwaite & Drahos 2000, p 19–20). Standards can take different forms and can include environmental quality standards (e.g. setting a quality standard to be reached for protected habitats or species, such as favorable conservation status) and performance standards or standards of best practice (e.g. requiring the use of a particular technology or “best” practice in carrying out an activity).

In international legal practice, it is not uncommon to combine rules and standards. For example, in the field of ocean law, States have adopted the so-called “generally accepted international rules or standards” (GAIRS) that influence implementation of legal obligations at the regional and national levels by creating regulatory “floors” and harmonizing practices across national boundaries. The law of the sea incorporates several GAIRS including rules mandating double hulling for fuel tankers and pollution prevention measures during maritime operations. These GAIRS are usually drafted by International Maritime Organization committees (e.g. Marine Environment Protection Committee), adopted as recommendations, and then implemented by individual states.

*Legal principles*, on the other hand, seek to orient actors toward goals and objectives, giving them options and a wide discretion for how they choose to respond. Principles become “legal” when they are included in legal instruments or adopted as part of the general practices of States. They can steer states in developing policies and legal rules. Legal principles can also play an important role in court: they enable courts to grant a ruling based on general principles, especially in the absence of precise rules or standards (Saunders 2021). Examples of environmental law principles include the precautionary principle, the polluter pays principle, and the prevention of harm principle.

An important distinction between principles and standards is how they address performance risks associated with achieving a particular goal or an objective (Braithwaite 2002; Black 2008). Principles can be useful for enabling a range of responses to broad objectives (Baldwin et al. 2011) and for facilitating

communication across stakeholders to construct context-dependent responses to problems (Akhtar-Khavari 2010). In the case of international law principles, States are effectively delegated the choice about how to respond to broadly shared goals and objectives depending on State capacity and interest (Black 2008). In contrast, legal standards tend to limit what is considered an appropriate compliance response.

Given the complex nature of multilateral law-making, rules, principles, and standards cannot always be suitably combined to further certain policy outcomes. Institutional contexts and opportunities matter very much in design but also in terms of what States are willing to accept as obligations. Sometimes principles, because of their open-textured nature, are the only legal tool that States will accept to constrain behavior. However, other times standards and rules can work together without principles when expectations and goals within a particular regime are relatively well established. In the next section, we examine which combination of legal tools is necessary to advance ecological restoration.

### Toward a New Legal Principle on Ecological Restoration and a Legal Basis for Performance Standards

Many of the international obligations and commitments on restoration are lacking a definition of what is restoration and are predominantly quantitatively (such as the Aichi targets, the Bonn Challenge, etc.). Many large restoration programs have underperformed or failed (Gann et al. 2018). We advocate for a combination of the establishment of a legal principle on ecological restoration on the one hand, and for the creation of a legal basis for performance standards on the other.

A new international legal principle on “ecological restoration” could result in a significant upscaling of the ecological quality of restoration outcomes. Palmer and Ruhl mention a “restoration principle” in the U.S. legal context, as a principle that would require to achieve ecological integrity (Palmer & Ruhl 2015). We support an international legal principle on *ecological* restoration. Such a legal principle of ecological restoration would require more from States than simply remediating and rehabilitating degraded land. The introduction of a legal principle on ecological restoration would oblige states to conduct restoration aimed at achieving the highest level of recovery possible. This would, for example, prevent reforestation programs with monocultures, or mere “ticking-the-box” exercises for greening a certain number of hectares without seeking the highest level of recovery attainable. A legal principle on ecological restoration should underpin the setting of ambitious restoration targets in law and policy (how much and which restoration) and should also guide the development of performance standards for restoration (how to conduct restoration activities). A legal principle on ecological restoration can also be an important addition to the prevention principle (when to act to avoid the need for restoration). Whereas the prevention principle is intended to avoid harm to the environment, a principle on ecological restoration would be immediately triggered if best efforts to prevent harm fail to protect the environment. Bastmeijer sees

restoration as “a promising strategy to address our failure to prevent” (Bastmeijer 2016).

Performance standards or standards of best practice on restoration are lacking in international biodiversity law. We argue for a legal basis for performance standards in law. This should include the obligation for states to comply with “international accepted standards.” How these international accepted standards can become part of the legal system will be discussed in the next section. The performance standards can be included in annexes or additional documents, which have a more flexible character than the law itself, and can be adapted to incorporate new knowledge on restoration from restoration science and practice. This could meet the concern raised by some ecologists that formal standards would restrict and limit restoration activities (see, e.g. the debate on standards and principles in Restoration Ecology between scholars grouped around Higgs et al. (2018) on the one hand and Gann et al. (2018) on the other, discussing the relative merits of the first edition of the International Standards for the Practice of Ecological Restoration; McDonald et al. 2016).

The second edition of the SER Principles and Standards (Gann et al. 2019) makes a clearer distinction on the principles underpinning restoration, and the standards of best practice. We acknowledge and recognize the importance of the SER Principles and Standards that offer granularity on what is otherwise a vague and somewhat inchoate duty for states to engage in ecological restoration practices. We emphasize that although the SER Principles and Standards, as well as other voluntary principles such as the UN Decade principles (UN Decade on Ecosystem Restoration Best Practices Task Force, September 2021), might stand on their own as voluntary global best practices, these standards would have more global impact if mainstreamed through existing frameworks of international law. Figure 2 shows the possible relationship between the legal principle on ecological restoration and the voluntary SER Principles and Standards.

What combination of tools might be adopted to further ecological restoration depends on the ambitions of political actors. Although rules to further increase quantitative targets may contribute to more restoration activities, States may choose also to prioritize the development of a legal regime that will harmonize expectations around the quality of restoration work to reflect the

science-based need for best practices. In the next part, we will look more concretely at how these different legal tools can be integrated at the international level, in particular in the framework of the CBD.

### Legal Tools to Upscale Ecological Restoration in International Law: Toward a CBD Restoration Protocol

What does the existence of legal rules, principles, and standards mean for global ecological restoration efforts? Introducing a legal principle of ecological restoration may catalyze a uniform ambition for States to participate collectively in global restoration efforts. In the legal toolbox, standards have been a favorite tool operating at the confluence between what is legally mandated and what may be technically feasible. Creating GAIRS to achieve ecological restoration may provide a much-needed common lexicon of practices to ensure national progress on ecological restoration work that can be compared globally. Presently, the CBD has no specific mechanism for developing ecological restoration GAIRS. It might be possible to amend the CBD to require standards to be developed. In terms of ecological restoration, the CBD could be amended to include an approach like Article X (the development of International Phytosanitary Measures) of the International Plant Protection Convention (IPPC 1997). Drawing on restoration science expertise, CBD parties could develop a set of specific harmonized measures applicable to ecological restoration. Notably under the IPPC, broadly applicable regional standards can be used as the basis for international standards. Something similar might allow for certain ecosystem-specific standards such as wetland restoration site design to be developed locally but then applied more broadly.

Although theoretically possible to amend a treaty, the CBD has never been amended. A treaty amendment is unlikely because the CBD has the better policy option of allowing for the development of a protocol, a legal instrument subsidiary to the CBD. A protocol typically elaborates on existing obligations within a treaty (e.g. 1985 Vienna Convention on the Ozone Layer and the 1987 Montreal Protocol) and may offer a timetable for achieving particular outcomes (e.g. 1992 UN Framework Convention on Climate Change and 1997 Kyoto Protocol).

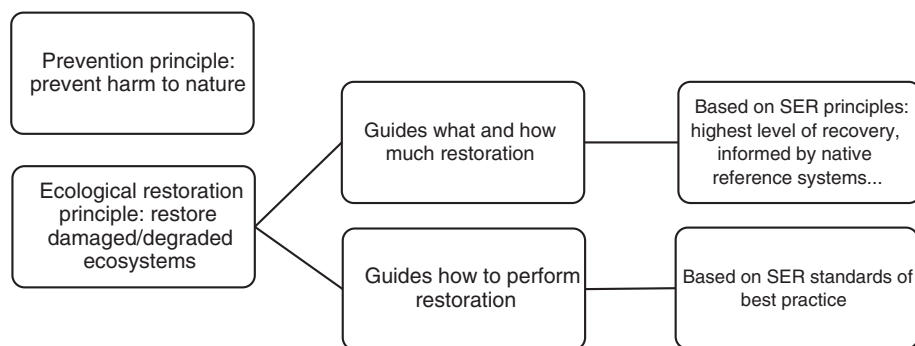


Figure 2. Relationship between a new legal principle on ecological restoration and SER Principles and Standards.



The CBD parties adopted a protocol on biosafety (Cartagena Protocol on Biosafety, 29 January 2000) and a protocol on access and benefit-sharing of genetic resources (Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, 29 October 2010).

In the case of the Nagoya Protocol, States are encouraged to develop codes of conduct, guidelines, and standards for access and benefit-sharing. Protocol parties agreed to “periodically take stock” of the instruments and “consider the adoption of specific codes of conduct, guidelines and best practices and/or standards.” (Nagoya Protocol, Article 20). This text leaves open the possibility of the development of access and benefit-sharing-related GAIRS that might articulate global expectations for national action. In response to the Nagoya Protocol, a number of States and communities (indigenous and nonindigenous) have developed model contractual clauses, codes of conducts, guidelines, best practices, and standards that are applied nationally or regionally. These are not GAIRS but could become the basis for future GAIRS.

In the case of ecological restoration, States should consider developing a protocol to highlight the principle of achieving ecological restoration and to develop ecological restoration standards. A possible model for a restoration protocol is the approach taken by the IPPC with states agreeing to cooperate in the development of international standards in accordance with a set of procedures established by an international commission who has the ultimate responsibility of adopting the standards. The development of such standards should be science-based and take into account regional differences, requirements for different ecosystems, as well as the need for flexibility regarding the evolving character of restoration science.

Any Ecological Restoration Commission developed by States to a CBD protocol could consult with other relevant international bodies including Secretariats from restoration-related treaties (e.g. UN Convention to Combat Desertification, Ramsar Convention). States should also direct any proposed Commission to consult with existing scientific expert bodies with global memberships such as SER on the content of scientifically relevant standards, using the SER Principles and Standards as an important basis. To address additional non-State stakeholder concerns, any proposed Commission should also consult with communities where any large-scale restoration activities are proposed to investigate what safeguards may be necessary to ensure that proposed technical restoration standards will not undermine existing sustainability measures but will complement and potentially enhance such measures (in accordance with the SER principle to engage stakeholders).

The introduction of a “Protocol for Ecological Restoration” with the creation of a Commission to develop standards would ensure that the 2021–2030 UN Decade on Ecosystem Restoration achieves meaningful scientific and institutional coordination. Although a protocol is the preferred legal instrument for mainstreaming standards, it may not be immediately political feasible. One alternative to a protocol is a Conference of the Parties (COP) decision under the CBD as part of development of the post-2020 global diversity framework. COP decisions,

although legally nonbinding, have influenced subsequent State action substantially and can serve as a formal means of interpreting binding treaty obligations. With the next COP under the CBD delayed because of the COVID pandemic, a draft text for a COP decision on the post 2020 biodiversity framework can only give us an idea of what negotiations have so far came up with. From the “Zero draft” of August 2020 (Update of the zero draft of the post-2020 global biodiversity framework, CBD/POST2020/PREP/2/1, 17 August 2020), it appears that the action targets include quantitative targets for restoration: “Target 1. By 2030, [50%] of land and sea areas globally are under spatial planning addressing land/sea use change, retaining most of the existing intact and wilderness areas, and allow to restore [X%] of degraded freshwater, marine and terrestrial natural ecosystems and connectivity among them.” Although the zero draft also proposes support mechanisms, such as the commitment to mobilize sufficient resources and the promotion of biodiversity science, the draft commitments are again predominantly quantitative and fail to provide a legal basis for quality standards. If a protocol on restoration is not feasible, then at least more detailed COP decisions on restoration will be necessary.

Any potential protocol or COP decision under the CBD must show a high ambition level for restoration, by including the recognition of a legal principle to achieve ecological restoration, by setting legally binding targets on restoration, as well as a process for prioritizing which specific habitats/ecosystems to restore, and obligations to develop national restoration plans, long-term monitoring duties, and mechanisms for financing and building capacity.

Another consideration to make is whether a protocol under the CBD should be limited to restoration or should address biodiversity loss more generally with restoration as just one of the solutions to tackle the biodiversity crisis. Scientists have already pointed to the need for a “global deal for nature,” similar to the Paris agreement on climate change, calling for a substantial increase in restoration effort (see, e.g. Dinerstein et al. 2019). For any broader international agreement on biodiversity, several legal options exist including a CBD protocol or a COP decision (Wemaere et al. 2018).

## Conclusion

Using a combination of rules, principles, and standards, law can help to answer questions on where, what, how, and how much ecological restoration can be done (Table 1). We strongly argue for the acceptance of a legal principle on “ecological restoration,” in order to go beyond rather simple quantitative targets for “restoration.” This principle can be combined with other principles such as the prevention principle and can be further developed and implemented through rules and standards. At the global level, a new protocol on ecological restoration under the CBD, providing a legal basis for a principle on ecological restoration and for the development of international standards of best practice would be ideal.

Although we advocate for a stronger international legal basis for ecological restoration, we are well aware of the limitations of (international) law. Even if an international law on ecological restoration is adopted, challenges will remain at the national level, including lack of financing, lack of public support,

**Table 1.** Translation of ecological requirements into legal provisions.

<i>Ecological Requirements on Restoration</i>	<i>Legal Provisions</i>
What?	Definition of restoration
Where?	Principle of ecological restoration In/outside protected areas Connectivity
When?	Timeframe: take restoration measures by certain date; or certain area/ecosystem restored by certain date
How much?	X% (of total land/sea area) restored X% of specific ecosystems restored
How?	Legal tools (obligations, prohibitions) Performance standards/standards of best practice: differentiate according to different ecosystems and geographical regions Control and monitoring

potential conflicts with spatial planning legislation, bottlenecks to realize restoration on private lands, including property rights or exceptions within agricultural laws and other barriers to reach restoration obligations (Cortina-Segarra et al. 2021). Legal rules, principles, and standards are an important element in upscaling restoration, but are certainly not the only tools.

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