HOW STANDARDS CAN IMPROVE IMPLEMENTATION OF GLOBAL RESTORATION INITIATIVES

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Introduction
About SER

**Mission:** to advance the science, practice, and policy of ecological restoration to sustain biodiversity, improve resilience in a changing climate, and re-establish an ecologically healthy relationship between nature and culture.
SER Programs

- **Networking and Education**
  - Nearly 3,000 members in 70 countries worldwide
  - 13 chapters across North America, Europe and Australasia
  - Biennial world conferences since 2007 (8th World Conference on Ecological Restoration in Cape Town, South Africa September 2019)
  - Annual or biennial chapter/regional conferences
  - Robust global continuing education program with webinars, symposia, field trips, workshops, discussion groups

- **International Policy**
  - Participation in global fora (e.g. CBD, UNCCD, UNEP)
  - Advocacy to elevate the role and effectiveness of ecological restoration, including through strategic initiatives like the *International Standards for the Practice of Ecological Restoration*

- **Publications**
  - *Restoration Ecology* (now in its 26th year)
  - Island Press-SER joint restoration book series with 28 titles to date
  - SER reports and policy papers

- **Certified Ecological Restoration Practitioner (CERP) program**
  - Began in 2017 by request of SER practitioner members
  - Nearly 300 practitioners certified through the program to date

- **Restoration Resource Center**
  - Wiki style, openly accessible database
  - Resources database with nearly 2000 resources (including e.g. articles, videos, webinars, websites)
  - Projects database with more than 300 projects
The Challenge: Restoration is becoming mainstream, but implementation and effectiveness is inconsistent at best. Ecosystem services are a principle reason for restoration, but focus on single services can create perverse incentives.

A Solution: SER’s International Standards provide criteria for ensuring high quality restoration from project design to implementation to evaluation. They can also help promote the bundling of ecosystem services.

From Theory to Practice: International stakeholder engagement, buy in, adoption, and implementation of ecological restoration standards. Integration between ecological restoration and ecosystem services.
The Challenge

MAINSTREAMING RESTORATION WITHOUT DIMINISHING IT
Why Restoration?

RECENT HEADLINES LIKE...

- UN report says earth faces “unprecedented” threat to biodiversity
- Report: 1 million animal, plant species face extinction risk
- World nearing “critical point of no return” on climate
- As The World Burns: The Case for a Restoration Imperative
- Re-Greening the Earth: Protecting the Climate through Ecosystem Restoration

ILLUSTRATE THAT...

Conservation alone is not enough; restoration is a matter of survival
Definitions

- **Ecological restoration (ER)** is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. (SER Primer 2004)

- **Restorative activities** are those activities, including ecological restoration, that reduce degradation or improve conditions for the partial or full recovery of ecosystems. These are sometimes described as a “family” of inter-related restorative activities.

- **Forest and landscape restoration (FLR)** is the process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes. (Global Partnership on Forest and Landscape Restoration)
Definitions

- **Degradation (D)**: a level of deleterious human impact to ecosystems that results in the loss of biodiversity and simplification or disruption in their composition, structure, and functionality, and generally leads to a reduction in the flow of ecosystem goods and services (MA 2005, Alexander et al. 2011).

- **Conservation (C)**: the action of conserving something in particular: preservation or protection of the natural environment (dictionary.com)

- **Ecosystem Services (ES)**: the direct and indirect contributions of ecosystems to human wellbeing.

- **Biodiversity (B)**: The variability among living organisms from all sources including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part... (UN)

- **Land Degradation Neutrality (LDN)**: A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remains stable or increases within specified temporal and spatial scales and ecosystems. (UNCCD)
Preliminary Restoration Equation

- **Current Status** (continued degradation)
  \[ C + ER < D \]
  \[ \uparrow ES_{C+ER} + \uparrow B_{C+ER} < \downarrow ES_D + \downarrow B_D \]

- **Short-term Goal** (land degradation neutrality)
  \[ C + ER = D \]
  \[ \uparrow ES_{C+ER} + \uparrow B_{C+ER} \leq \downarrow ES_D + \downarrow B_D \]

- **Long Term Goal** (net improvement in ecological condition)
  \[ C + ER > D \]
  \[ \uparrow ES_{C+ER} + \uparrow B_{C+ER} > \downarrow ES_D + \downarrow B_D \]

Other factors to include:
- Climate change may increase impacts of degradation while reducing effectiveness of restoration
- Focus on a single ecosystem services may result in increase in ES with a reduction in biodiversity and other ecosystem functions (\( \uparrow ES + \downarrow B \))
Global Initiatives & Targets

- Sustainable Development Goals
- UN Decade on Ecosystem Restoration from 2021-2030
- UN CBD Aichi Biodiversity Targets/post-2020 Targets
- Bonn Challenge/New York Declaration on Forests
- Reducing emissions from deforestation and forest degradation (REDD+)
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
- Paris Climate Summit
Global Initiatives: IPBES

‘Transformative changes’ needed to restore and protect nature

>500,000 (+/-9%): share of the world’s estimated 5.9 million terrestrial species with insufficient habitat for long term survival without habitat restoration

https://www.ipbes.net/news/Media-Release-Global-Assessment#3-Global%20targets
Global Initiatives: Sustainable Development Goals
Global Initiatives: UN Decade on Ecosystem Restoration

- On March 1, 2019, the UN General Assembly designated 2021-2030 as the UN Decade on Ecosystem Restoration
- Goals and implementation still in the planning phase
- Restoring 350 million hectares of degraded land by 2030 could:
  - Remove an additional **13-26 gigatons of greenhouse gases** from the atmosphere.
  - generate **USD 9 trillion in ecosystem services**
- Defining ecosystem restoration as: “a process of reversing the degradation of ecosystems, such as landscapes, lakes and oceans to regain their ecological functionality; in other words, to improve the productivity and capacity of ecosystems to meet the needs of society.”

Global Targets: Aichi Targets

The Convention on Biological Diversity (CBD) adopted the Aichi Targets in 2010, with intent to achieve the targets by 2020

**Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services**

**Target 14**
By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

**Target 15**
By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

CBD website: [https://www.cbd.int/sp/targets/](https://www.cbd.int/sp/targets/)
Global Initiative/Target: Bonn Challenge

- Launched in 2011
- Amended by the NY Declaration on Forests
  - Restore 150 million hectares of deforested and degraded land by 2020
  - Restore 350 million hectares of deforested and degraded land by 2030
- More than 170 million hectares of commitments to date
- Regional Initiatives include:
  - Initiative 20/20
  - AFR 100

Global Targets: Bonn Challenge

AFR100 (the African Forest Landscape Restoration Initiative) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030.

AFR100 contributes to the Bonn Challenge, the African Resilient Landscapes Initiative (ARLI), the African Union Agenda 2063, the Sustainable Development Goals and other targets. Follow #AFR100

COMMITMENT TRACKER

113% COMMITTED

Aggressive Targets = Aggressive Action

TARGETS ≠ STANDARDS

- International targets for reforestation and restoration drive action, but implementation is inconsistent, there are no commonly accepted standards for restoration.

- Adopting and implementing international standards can create a basis upon which to measure project and program effectiveness.

CLIMATE MITIGATION ALONE ≠ ECOLOGICAL RESTORATION

- Projects focused on delivering one ecosystem service, like carbon, are not necessarily restoration projects. Example: Carbon and reforestation targets drive afforestation – native ecosystems and biodiversity can be degraded.

- Minimal attention to socio-cultural/socio-economic needs and realities

BUT... AN INTEGRATED APPROACH TO ECOLOGICAL AND ECOSYSTEM RESTORATION GOALS CAN HELP DELIVER BOTH BIODIVERSITY AND ECOSYSTEM SERVICES OUTCOMES
Case study: Grain for Green Program in China

- Started in 1999 to deliver two specific ecosystem services: flood control and erosion control; additional intended benefits of timber, tree fruits, and other cash crops
- Considered largest or one of the largest reforestation programs in the world
- Re-established 27.8 million hectares of forest through 2013
- Majority of projects (82%) are monocultures
- Project resulted in significant loss of biodiversity for bees, birds, and insects
- Grain for Green can be improved with native multi-species reforestation efforts

Hua et al. 2016. Opportunities for biodiversity gains under the world’s largest reforestation programme. *Nature Communications*. 7:12717
A Solution

STANDARDS AND GUIDELINES
Standards and Guidelines

A variety of standards and guidelines exist to help implement global initiatives and achieve global targets, including:

- Ecological restoration for protected areas: principles, guidelines and best practices (*IUCN with Parks Canada and SER*)
- 12 Principles for the Ecosystem Approach (*CBD*)
- REDD+ Social and Environmental Standards (*REDD*)
- FLR Principles (*GPFLR*)
- International Standards for the Practice of Ecological Restoration (*SER*)
International Standards for the Practice of Ecological Restoration

- Introduced at Convention on Biological Diversity COP13 in Cancun, Mexico; December 2016
- Built on SER foundation docs (e.g., SER 2004 Primer; 2012 Ecological Restoration in Protected Areas; and SER-Australia 2016 National Standards)
- Reviewed by 2 dozen external reviewers from around the world, incorporating broad perspectives on restoration.
- Designed to be a living document with regular review and revision.
After publication of the Standards, SER underwent 2 years of extensive internal and external review, including, e.g., listening sessions, web surveys, knowledge cafés, and published critiques and responses. Four key topics were identified for improvement in V2:

- strengthen the discussion of cultural-social elements including traditional cultural ecosystems
- clarify and expand the text related to restoration targets so that readers better understand the need to allow for temporal change
- improve the restorative continuum with respect to the ecosystem-landscape nexus
- consider provenance issues for seeds and other propagules
International Standards

The SER standards are applicable in all types of ecosystems.

Photos courtesy Tein McDonald
International Standards

The standards are applicable across all sectors

Photos courtesy Tein McDonald
Section I: Introduction

- Ecological restoration as a means of conserving biodiversity and improving human wellbeing and it’s role in broader global initiatives
  - Important to deliver both ecosystem services and biological diversity
- Need for principles and standards
- Approach to the standards
- What’s new in this version
- Underpinning assumptions
- Key definitions and terms
Key Updates in V2

- The principles are reorganized to highlight social-economic and cultural components, including a new “Social Benefits Wheel”

- Principles and Key Concepts are merged into a single section of “Eight Principles that Underpin Ecological Restoration

- Scaling-up ecological restoration and the relationship between ecological restoration and allied activities is expanded.

- Key topics related to reference models and restoration approaches are in a new Section IV on Leading Practices, including content on:
  - sourcing of seeds and other propagules for restoration, and
  - integrating ecological restoration into global restoration initiatives.
Section II: Eight Principles that Underpin Ecological Restoration

1. Engages stakeholders
2. Draws on many types of knowledge
3. Is informed by native reference ecosystems, while considering environmental change
4. Supports and optimizes ecosystem recovery processes
5. Seeks the highest level of recovery possible
6. Is assessed against clear goals and objectives using measurable indicators
7. Gains cumulative value when applied at large scales
8. Is part of a continuum of restorative activities
Principle 1

Ecological restoration engages stakeholders

Social Benefits Wheel
Principle 2

Ecological restoration draws on many types of knowledge

The practice of ecological restoration requires a high degree of ecological knowledge that can be drawn from practitioner experience, Traditional Ecological Knowledge, Local Ecological Knowledge, and scientific discovery.
Principle 3

Ecological restoration practice is informed by native reference ecosystems, while considering environmental change

Reference ecosystem – a native ecosystem able to act as a model for ecological restoration (as distinct from a reference site). A reference ecosystem usually represents a nondegraded version of the ecosystem complete with its flora, fauna (and other biota), abiotic elements, functions, processes and successional states that would have existed on the restoration site had degradation not occurred—but adjusted to accommodate changed or predicted environmental conditions.
Principle 3

DECISION TREE FOR
REFERENCE ECOSYSTEMS

Are the current site conditions still broadly suitable for the existing or immediately prior ecosystem?

YES

USE THAT ECOSYSTEM (full or partial recovery)

NO

Is this due to an ambient change which is feasible and desirable to amend?

YES

AMEND AND USE PRIOR ECOSYSTEM

NO

Could the conditions suit an alternative native ecosystem or state more feasible and desirable?

YES

USE THE ALTERNATIVE ECOSYSTEM

NO

Can the site be managed in some other restorative manner?

YES

SELECT THE MOST RESTORATIVE OPTION

NO
Principle 4

Ecological restoration supports and optimizes ecosystem recovery processes

All restoration interventions are designed to assist natural processes of recovery that ultimately are carried out by the effects of time on physical processes and the responses and interactions of the biota as they go through their life cycles. Restoration interventions focus on reinstating components and conditions suitable for these processes to recommence and support recovery of ecosystem attributes, including capacity for self-organization and for ecosystem resilience to future stresses.
Principle 5

Ecological restoration seeks the highest level of recovery possible

Full recovery, partial recovery, and recovery “insofar as possible.” Recovery can be assessed using the “5-Star Recovery Scale” and the “Ecological Recovery Wheel”
Principle 5

### 5-Star Scale

<table>
<thead>
<tr>
<th>Attribute</th>
<th>★</th>
<th>★★</th>
<th>★★★</th>
<th>★★★★</th>
<th>★★★★★</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absence of threats</strong></td>
<td>Further deterioration discontinues and site has tenure and management secured.</td>
<td>Threats in adjacent areas beginning to be managed or mitigated.</td>
<td>All adverse threats managed or mitigated to a low extent.</td>
<td>All adverse threats managed or mitigated to an intermediate extent.</td>
<td>All threats managed or mitigated to high extent.</td>
</tr>
<tr>
<td><strong>Physical conditions</strong></td>
<td>Gross physical and chemical problems (e.g., contamination, erosion, compaction).</td>
<td>Substrate chemical and physical properties (e.g., pH, salinity, organic content) stabilised within natural range.</td>
<td>Substrate stabilised within natural range and supporting growth of characteristic taxa.</td>
<td>Substrate security, maintaining ecosystem processes similar to that of the reference ecosystem with evidence of inherent species and processes.</td>
<td>High diversity of characteristic species (e.g., &gt;50% of reference) across the site, with high similarity to the reference ecosystem, improved potential for colonization of more species over time.</td>
</tr>
<tr>
<td><strong>Species composition</strong></td>
<td>Coloring native species (e.g., &gt;25% of species of the reference ecosystem). No threat to regeneration efforts or future successions.</td>
<td>Genetic diversity of site adjusted and a small subset of characteristic native species established (e.g., &gt;50% of reference). Low threat from exotic invasive or undesirable species.</td>
<td>A subset of key native species (e.g., &gt;25% of reference) establishing over substantial proportions of the site. Very low threat from exotic invasive or undesirable species.</td>
<td>Substantial diversity of characteristic native species (e.g., &gt;60% of reference) present on the site and representing a wide diversity of species groups. Very low threat from exotic invasive or undesirable species.</td>
<td>High diversity of characteristic species (e.g., &gt;50% of reference) across the site, with high similarity to the reference ecosystem, improved potential for colonization of more species over time.</td>
</tr>
<tr>
<td><strong>Structural diversity</strong></td>
<td>One or fewer strata present, and no spatial patterning or morphological complexity relative to reference ecosystem.</td>
<td>More strata present but low spatial patterning and morphological complexity relative to reference ecosystem.</td>
<td>Most strata present, and some spatial patterning and morphological complexity relative to reference ecosystem.</td>
<td>All strata present, and some spatial patterning and morphological complexity relative to reference ecosystem.</td>
<td>All strata present, and spatial patterning evident and morphological complexity high. Further complexity and spatial patterning able to self-organize to highly resemble reference ecosystem.</td>
</tr>
<tr>
<td><strong>Ecosystem functionality</strong></td>
<td>Substrates and hydrology are at a foundational stage only, capable of future development of functions similar to the reference.</td>
<td>Substrates and hydrology show increased potential for a wider range of functions (e.g., nutrient cycling, and provision of habitat resources for other species).</td>
<td>Evidence of key functioning ecosystem processes commencing (e.g., nutrient cycling, water filtration and provision of habitat resources for a range of species).</td>
<td>Evidence of key functions and processes commencing including reproduction, dispersal and recruitment of species.</td>
<td>Considerable evidence of key functions and processes on a secure trajectory towards reference and evidence of ecosystem resilience likely after termination of appropriate disturbance regimes.</td>
</tr>
<tr>
<td><strong>External exchanges</strong></td>
<td>Potential for exchanges of species, genes, water, fish with surrounding landscapes or aquatic environments identified.</td>
<td>Connectivity for enhanced positive ecological exchanges, not significantly reduced through cooperation with stakeholders and configuration of site.</td>
<td>Connectivity increasing and exchanges between site and external environment starting to be evident (e.g., more species, fish, etc.).</td>
<td>High level of connectivity with other natural areas established, ongoing control of pest species, and undesirable introduced species.</td>
<td>Evidence that potential for external exchanges is highly similar to reference and long term integrated management arrangements with broader landscape in place and operation.</td>
</tr>
</tbody>
</table>
Principle 5

Ecological Recovery Wheel
Principle 5

Hypothetical Case Study

Baseline condition pre-restoration

10 years post treatment
Principle 6

Ecosystem recovery is assessed against clear goals and objectives, using measurable indicators

Both ecological and social attributes of the project should be included in the planning phase. Indicators can then be used to monitor progress over time, applying adaptive management approaches. Resources for appropriate monitoring must to be allocated, alongside resources for all other elements of a restoration project, during the planning phase.
Principle 6

Case Study: New South Wales, Australia

Construction: Riverina LLS
Principle 6

Calibrating the recovery wheel

Principle 6

Calibrating the recovery wheel

CWC Gardens, Condor

Abyssal Plain, CCZ

Hydrothermal vents

Soft bottom seamount

30 Y

MERCES

IS ASSESSED AGAINST CLEAR GOALS AND OBJECTIVES USING MEASURABLE INDICATORS
Principle 7

Ecological restoration gains cumulative value when applied at large scales

Some ecosystem processes (such as gene flow, colonization, predation and ecological disturbances) function at larger scales (larger aquatic environment, landscape, watershed, etc.), as do degradation processes.

Some species may have large minimum habitat areas (or greater trophic complexity) than is provided by small scale projects unless these are linked within a larger program or to protected areas.

Substantially increasing the scale of carbon sequestration through extensive additional plants and animal biomass (including biomass in soils) is also urgently needed.

Thus, ecological restoration needs to be at scales (these may be at the hundreds to the thousands, to millions of hectares) that provide needed environmental and ecological benefits.
Principle 8

Ecological restoration is part of a continuum of restorative activities

Ecological restoration is one part of a range or family of restorative activities that can be conceived as occurring along a continuum. The concept of a restorative continuum ensures a holistic approach to repairing the world’s ecosystems.

Restorative activities reduce degradation or improve conditions for the partial or full recovery of ecosystems.
Principle 8
Section III: Standards of Practice for Planning & Implementation

I. Planning and Design

II. Implementation

III. Monitoring, documentation, evaluation, and reporting

IV. Post-implementation maintenance
Section IV: Leading Practices

- Developing the reference model
- Identifying appropriate ecological restoration approaches
- Selection of seeds and other propagules for restoration
- The role of ecological restoration in global restoration initiatives
Developing the reference model

The reference model should account for multiple ecosystem attributes and their variation within the target ecosystem, as well as overall ecosystem complexity and dynamics (i.e., changes over time).

Best practices include:

- Utilizing a broad set of ecosystem attributes
- Recognizing complexity
- Incorporating change
- Using multiple reference sites
Uncoupling the reference ecosystem from the target

The reference model should describe the native ecosystem as if full recovery were the target.

In projects in which full recovery is possible and desirable, the ecological target will align with the reference model. In projects aiming for partial rather than full recovery, however, the target and reference model will not fully align. For example, the target ecosystem may lack some species or include non-native surrogates, or the ecological targets may be modified to meet social targets.
Identifying Appropriate Ecological Restoration Approaches

Three approaches may be used singly or in combination if appropriate. All of them utilize natural recovery processes and require ongoing adaptive management until recovery is attained.

- Natural (or spontaneous) regeneration
- Assisted regeneration
- Reconstruction
Selecting Seeds & Other Propagules

- Genetic considerations for sourcing seeds and other propagules
  - the degree of local adaptation varies by species, population, and habitat

- Climate change and propagule sourcing
  - Addressing changes in the climate “envelope” or “niche”

- Tools and future directions

- Restoring connectivity and assisting migration
Selecting Seeds & Other Propagules

Table 7. Where a plant lies along a spectrum of species and habitat characteristics can assist seed sourcing decisions (modified from Havens et al. 2015).

<table>
<thead>
<tr>
<th>More conservative/local seed sourcing</th>
<th>More relaxed/longer distance seed sourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Species characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Narrowly distributed including edaphic endemic</td>
<td>Widely distributed</td>
</tr>
<tr>
<td>Taxonomic uncertainty (potential for cryptic species)</td>
<td>Taxonomic stability (well-studied)</td>
</tr>
<tr>
<td>Little long-distance gene flow</td>
<td>Extensive long-distance gene flow</td>
</tr>
<tr>
<td><strong>Habitat characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Historically fragmented</td>
<td>Recently fragmented</td>
</tr>
<tr>
<td>High quality</td>
<td>Highly degraded</td>
</tr>
<tr>
<td>Ancient or stable landscape</td>
<td>Young or dynamic landscape</td>
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</tbody>
</table>
Provenancing strategies for revegetation (reprinted from Prober et al. 2015). The star indicates the site to be revegetated and the circles represent native populations used as germplasm sources. The circle size indicates the relative quantities of germplasm included from each population at the revegetation site.

These strategies can also be applied to animals and soil biota.
The Role of Ecological Restoration in Global Initiatives

- Ecological restoration plays a critical role in a host of global restoration initiatives
- Ecological restoration is being scaled up
- Large scale initiatives often utilize landscape restoration approaches, including:
  - Landscape restoration
  - Forest landscape restoration
  - Ecological restoration
- For ecological restoration to be included in landscape restoration the restoration targets and goals must meet human needs (though they are not limited to meeting human needs)
- When delivered at the landscape level, integrated approaches that incorporate multiple types of restorative activities along the continuum are most likely to be successful
Glossary and Appendices

- Section V: Glossary
- Appendix 1: Generic principles that underpin ecological restoration and allied activities
- Appendix 2: Blank social benefits and ecological recovery wheel templates
From Theory to Practice
Standards V2 Timetable

- SER Standards V2 are finished and going through peer review for publication in *Restoration Ecology* as a stand alone, open-access, special issue of the journal.

- SER will simultaneously publish the Standards following the same format as V1. We will launch V2 of the Standards at the 8th World Conference on Ecological Restoration in Cape Town, South Africa in September 2019. (Early bird registration closes on June 30!)
Implementation

- Seek active implementation from a broad diversity of local, regional, and global entities

- Engage partners and stakeholders to utilize the international standards as a framework for developing biome or region specific standards, e.g.
  - Tropical forests
  - Arid lands

- Engage partners and stakeholders to utilize the international standards as a framework for developing industry specific standards, e.g.
  - Mining
  - Oil and gas extraction

- Document projects and programs being implemented according to the Standards and assess effectiveness

- Translate/provide Standards in multiple languages (original edition available in Portuguese, Spanish, French, Korean, and Arabic)

- Utilize the standards as a core component of an integrated approach to landscape level sustainable use, conservation and restoration

- Assess, monitor, and as needed, adapt the Standards to improve their utility
THANK YOU

QUESTIONS:

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BETHANIE WALDER: BETHANIE@SER.ORG
Global Tools: STAPER

The CBD Short Term Action Plan on Ecosystem Restoration (STAPER) was adopted in 2016 at the CBD COP13, Cancun, Mexico.

The STAPER includes 4 Main Groups of Activities & 24 Steps

- Group A: Assessment of opportunities for ecosystem restoration (6 steps)
- Group B: Improving the institutional enabling environment for ecosystem restoration (10 steps)
- Group C: Planning and implementation of ecosystem restoration activities (5 steps)
- Group D: Monitoring, evaluation, feedback and disseminating results (3 steps)
IUCN Restoration Assessment and Opportunities Methodology can deliver six main products:

- A shortlist of the most relevant and feasible restoration intervention types across the assessment area
- Identified priority areas for restoration
- Quantified costs and benefits of each intervention type
- Estimated values of additional carbon sequestered by these intervention types
- A diagnostic of the presence of key success factors and identification of strategies to address major policy, legal and institutional bottlenecks
- Analysis of the finance and resourcing options for restoration in the assessment area
Global Targets: Bonn Challenge

# Section III: Planning & Implementation

## Performance standards at a glance

The National Standards for the Practice of Ecological Restoration in Australia includes a checklist of specific performance standards that guide restoration planners, practitioners and managers on how to (1) plan, (2) design, (3) implement, and (4) monitor and document an ecological restoration project, based upon the six key principles.

<table>
<thead>
<tr>
<th>1 Planning and design</th>
<th>2 Implementation</th>
<th>3 Monitoring, documentation, evaluation and reporting</th>
<th>4 Post-implementation and maintenance</th>
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</thead>
<tbody>
<tr>
<td>1.1 Stakeholder engagement is essential to the sustained success of any project</td>
<td>2.1 No further lasting damage is caused by the restoration works</td>
<td>3.1 Monitoring evaluates progressive restoration outcomes</td>
<td></td>
</tr>
<tr>
<td>1.2 Plans are informed by regional conservation goals and priorities</td>
<td>2.2 Treatments are interpreted and carried out responsibly, effectively and efficiently</td>
<td>3.2 Adequate records of treatments (inputs) and all monitoring are maintained</td>
<td></td>
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<tr>
<td>1.3 Plans identify the site’s current ecosystem and its condition</td>
<td>2.3 All treatments are undertaken in a manner that is responsive to natural processes and fosters and protects natural recovery</td>
<td>3.3 Evaluation and documentation of the progress of the work against goals and objectives</td>
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</tr>
<tr>
<td>1.4 Plans identify and describe the appropriate local native reference ecosystem(s)</td>
<td>2.4 Corrective changes of direction in response to unexpected ecosystem responses</td>
<td>3.4 Reporting of progress to key stakeholders</td>
<td></td>
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<tr>
<td>1.5 Plans identify clearly stated restoration targets, goals and objectives</td>
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<tr>
<td>1.6 Plans contain clearly stated treatment prescriptions for each zone</td>
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<tr>
<td>1.7 The long-term conservation management of the site is indicated before undertaking a restoration plan</td>
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<tr>
<td>1.8 The potential for resourcing the project and likely risks is considered</td>
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<tr>
<td>1.9 Plans include a schedule and time-frame for review</td>
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<td></td>
<td>4.1 The management body is responsible for ongoing maintenance and carries out monitoring to ensure that the site does not regress</td>
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