New international restoration standards provide guidance for improving ecological and biodiversity outcomes of forest landscape restoration

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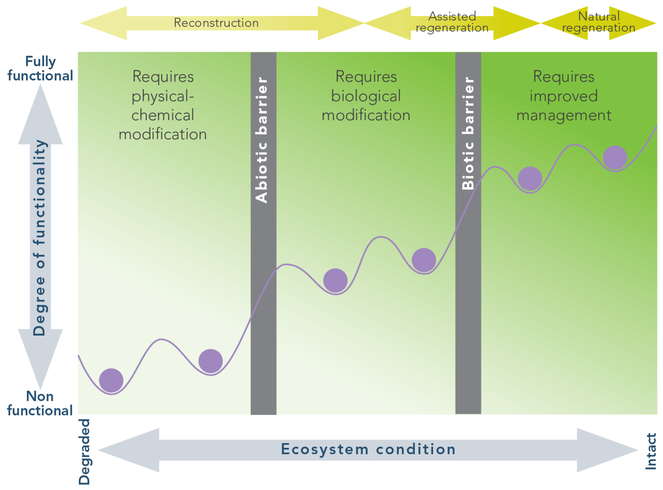
Abstract

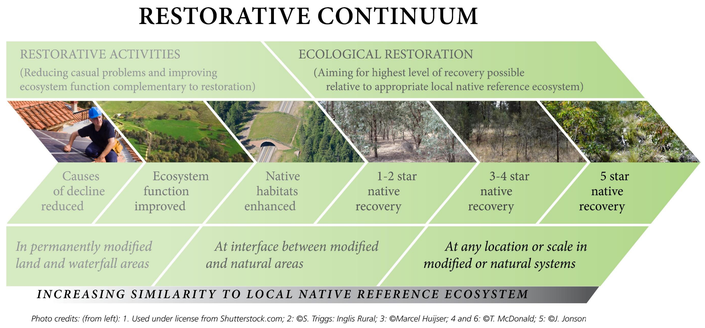
The International Standards for the Practice of Ecological Restoration provide comprehensive guidance to planners, managers, practitioners, operational personnel, regulators and funding agencies involved in restoring degraded ecosystems anywhere in the world – whether terrestrial, freshwater, coastal or marine. The International Standards place ecological restoration into a global context, including its role in conserving biodiversity and improving human well-being. The standards are particularly important in helping clarify the role of ecological restoration in the context of climate change, and also act as an important tool for achieving international targets as outlined in, for example, the Bonn Challenge, the UN Sustainable Development Goals, and the Convention on Biological Diversity's Aichi Targets.

The standards include 6 key attributes, they articulate a 5-star system for rating ecological restoration projects, and they introduce a restorative continuum that helps identify where different practices fit into the overall family of restorative activities.

Arbor Day planting at Waiwhakareke Natural Heritage Park in Hamilton, New Zealand, June 2016. This urban restoration project provides ecological and community benefits. *Photo credit: Peter Drury for Hamilton City Council*



Conceptual model of ecosystem degradation and responses to it through restoration (adapted from Keenleyside et al. 2012 and Whisenant 1999; cf. Hobbs & Harris 2001). An ecosystem can remain in a steady state (represented by troughs in the diagram) prior to being shifted by restoration or degradation over a barrier (represented by peaks in the diagram) towards a higher or a lower degree of functionality.



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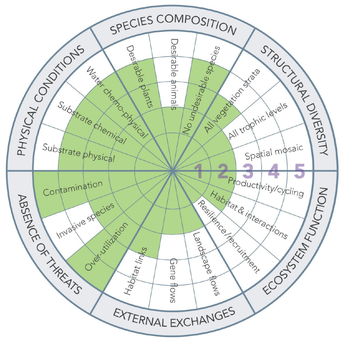
The restorative continuum includes a broad range of activities to repair damage to the broader environment, complement ecological restoration, and provide improved conditions for broad scale recovery.

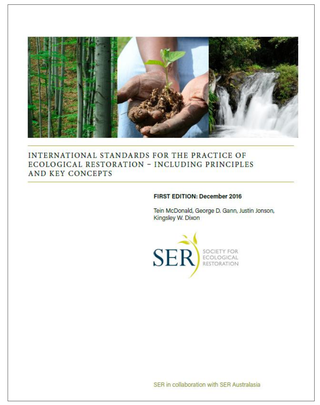
5-Star Recovery Scale

Number of stars	SUMMARY OF RECOVERY OUTCOME *(Note: Modelled on ecologically appropriate local native reference conditions)*
*	Ongoing deterioration prevented. Substrates remediated (physically and chemically). Some level of native biota present; future recruitment niches not negated by biotic or abiotic characteristics. Future improvements for all attributes planned and future site management secured.
**	Threats from adjacent areas starting to be managed or mitigated. Site has a small subset of characteristic native species and low threat from undesirable species onsite. Improved connectivity arranged with adjacent property holders.
***	Adjacent threats being managed or mitigated and very low threat from undesirable species onsite. A moderate subset of characteristic native species are established and some evidence of ecosystem functionality commencing. Improved connectivity in evidence.
****	A substantial subset of characteristic biota present (representing all species groupings), providing evidence of a developing community structure and commencement of ecosystem processes. Improved connectivity established and surrounding threats being managed or mitigated.
*****	Establishment of a characteristic assemblage of biota to a point where structural and trophic complexity is likely to develop without further intervention. Appropriate cross boundary flows are enabled and commencing and high levels of resilience is likely with return of appropriate disturbance regimes. Long term management arrangements in place.



Progress evaluation 'recovery wheel' depicting a hypothetical 1-year old restoration project on its way to a 4-star condition.

Initial restorative activities such as single-species revegetation projects can be transformed over time into diverse 4-star to 5-star restoration projects. Left, Bethany Beach, Delaware, USA, ©ER&M/Biohabitats. Right, Delray Beach, Florida, USA ©George D. Gann.



http://www.ser.org/standards

Key Points

- SER's International Standards for the Practice of Ecological Restoration fill a critical gap in the Forest Landscape Restoration (FLR) arena, providing guidance and support for the technical application of ecological restoration treatments across all geographic and ecological areas, including forests, specifically to: 1) improve biodiversity outcomes, 2) secure the delivery of a broad range of ecosystem services, 3) ensure projects are integrated with socio-cultural needs and realities, and 4) contribute to the 2030 Agenda for Sustainable Development and other international agreements (e.g., Bonn Challenge). The Standards complement the Convention on Biological Diversity's Short-term Action Plan for Ecological Restoration, which assists countries in meeting the Aichi targets.
- Though important tools and guidance are currently available to support land owners and planners with the process for FLR planning (e.g., ROAM), SER's International Standards are the first international tool to guide project designers, managers and funders in the technical approach needed to implement ecological restoration, one of the most promising methods of maximizing benefits from FLR.
- The multitude of international agreements related to conservation, forest restoration and climate change mitigation are important drivers for FLR, but they have the potential to create perverse incentives that favor the prioritization of one, or just a few, ecosystem services (e.g., wood products, carbon sequestration) over others (e.g., biodiversity, stakeholder needs). SER's International Standards can guide project or landscape level approaches that achieve the full promise of ecological restoration, including a broad range of ecosystem services, biodiversity objectives and socio-cultural targets.