



ECOLOGICAL RESTORATION & GLOBAL OPPORTUNITIES FOR RESTORATION

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Many of the world's ecosystems have undergone significant degradation with negative impacts on biological diversity and peoples' livelihoods. There is a growing realization that we will not be able to conserve the earth's biological diversity through the protection of critical areas alone. When applicable, Ecosystem Restoration should be an important component of conservation and sustainable development programs so that the livelihoods of people depending on these degraded ecosystems can be sustained. Ecological restoration connects people with nature, fosters sustainable socioeconomic development, and improves human health and wellbeing. Ecological restoration requires the integration of science and other forms of knowledge with practice. Many of the world's ecosystems have undergone significant degradation with negative impacts on biological diversity and peoples' livelihoods. There is now a growing realisation that we will not be able to conserve the earth's biological diversity through the protection of critical areas alone. This paper explains what is meant by the term "ecological restoration" and outlines how it can provide enhanced biodiversity outcomes as well as improve human well-being in degraded landscapes. In this way ecological restoration becomes a fundamental element of ecosystem management .Given that many people now depend on what have become degraded ecosystems to sustain their livelihoods, ecological restoration needs to address four elements. These elements are critical to successful ecosystem management. Ecological restoration should:

- Improve biodiversity conservation
- Improve human livelihoods
- Empower local people
- Improve ecosystem productivity

This means ecological restoration can be a primary component of conservation and sustainable development programs throughout the world. The conservation benefits of restoration are obvious. What is less apparent, but which is at least as important, is that in many instances, ecological restoration has also been able to renew economic opportunities, rejuvenate traditional cultural practices and refocus the aspirations of local communities .Ecological restoration has as its goal an ecosystem that is resilient and self-



sustaining with respect to structure, species composition and function, as well as being integrated into the larger landscape and supporting sustainable livelihoods. There are two major challenges involved when undertaking ecological restoration. One is how to undertake restoration across large areas comprising a variety of land-uses. The second is how to equitably balance the trade-offs between improving biodiversity conservation and improvements in human well-being.

Ecological restoration is a well-established practice in biodiversity conservation and ecosystem management. We have itemized fourteen principles of good ecological restoration practice based on experience gained over several decades. These principles, and the Attributes of Restoration Progress below, are consistent with both the scope and intent of the Convention on Biological Diversity's Principles for the Ecosystem Approach.

Principles of good ecological restoration practice include:

- Incorporating biological and environmental spatial variation into the design.
- Allowing for linkages within the larger landscape.
- Emphasizing process repair over structural replacement.
- Allowing sufficient time for self-generating processes to resume.
- Treating the causes rather than the symptoms of degradation.
- Include monitoring protocols to allow for adaptive management.

The circumstances that we seek to address are often very challenging. The areas of degraded land now present in various parts of the world are large. Some systems are severely degraded and will be costly to repair. Further, many of these degraded systems are still being used by people and many of these people are poor. We may not succeed in fully eradicating the causes of degradation in these circumstances but there is sufficient evidence from a variety of case studies for us to be optimistic. This evidence makes it clear that ecological restoration will be a key element not only of conservation but also for sustainable development worldwide.

Restoration can be large-scale or small scale, it can be carried out by one or a few individuals or via government programs involving thousands of



participants. It can be well resourced or modestly funded, it can involve ecosystems that can be restored quickly or those that will require hundreds of years before ecological recovery can be said to have occurred. In all cases ecological restoration will improve the biological diversity on degraded landscapes, increase the populations and distribution of rare and threatened species, enhance landscape connectivity, increase the availability of environmental goods and services, and contribute to the improvement of human well-being. The development of a global rationale for ecological restoration was first suggested by the IUCN Commission on Ecosystem Management (CEM)

Over the last several centuries, vast forest areas have been cleared as agriculture has spread and human populations have grown. About 30 percent of global forest cover has been completely cleared and a further 20 percent has been degraded. The new map indicates a restoration opportunity twice as large as the old one. This is mainly because a more precise mapping of potential forest extent has increased the estimate of degraded lands with opportunities for restoration.

More than two billion hectares worldwide offer opportunities for restoration---an area larger than South America. Most of these lands are in tropical and temperate areas.

- One and a half billion hectares would be best-suited for mosaic restoration, in which forests and trees are combined with other land uses, including agroforestry, smallholder agriculture, and settlements.
- Up to about half a billion hectares would be suitable for wide-scale restoration of closed forests.
- In addition to these two billion hectares, there are 200 million hectares of unpopulated lands, mainly in the far northern boreal forests, that have been degraded by fire. These areas would likely be difficult to restore due to their remoteness.

Croplands and densely populated rural areas on former forest lands amount to a further one billion hectares. They do not offer extensive restoration opportunities in terms of area, but some of these lands would benefit from having trees planted in strategic places to protect and enhance agricultural productivity and other ecosystem functions.

Restoration of Forests and Landscapes

Forest and landscape restoration is about more than just trees. It goes beyond afforestation, reforestation, and ecological restoration to improve

both human livelihoods and ecological integrity. Key characteristics include the following:

- Local stakeholders are actively engaged in decision making, collaboration, and implementation.
- Whole landscapes are restored, not just individual sites, so that trade-offs among conflicting interests can be made and minimized within a wider context.
- Landscapes are restored and managed to provide for an agreed, balanced combination of ecosystem services and goods, not only for increased forest cover.

