UNEP

CBD

Convention on Biological Diversity

Distr.
GENERAL

UNEP/CBD/SBSTTA/14/INF/15
15 April 2010

ORIGINAL: ENGLISH

SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE
Fourteenth meeting
Nairobi, 10-21 May 2010
Item 3.4 of the provisional agenda*

SOCIETY FOR ECOLOGICAL RESTORATION – INTERNATIONAL PRIMER ON ECOLOGICAL RESTORATION

Note by the Executive Secretary

1. The Executive Secretary is circulating herewith, for the information of participants in the fourteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, a note outlining the practice of ecological restoration which aims to reinstate degraded or lost ecosystem structure and function thereby contributing toward the achievement of biodiversity targets.

2. This note has been prepared by the Society for Ecological Restoration (SER) International.

3. The document is circulated in the form and language in which it was received by the Secretariat of the Convention on Biological Diversity.

-----

* UNEP/CBD/SBSTTA/14/1

Society for Ecological Restoration International

April 2010

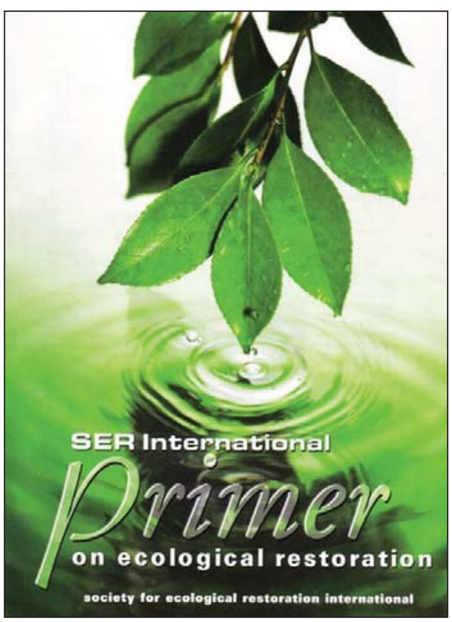
INFORMATION NOTE SUBMITTED TO THE CBD SECRETARIAT

WHAT IS ECOLOGICAL RESTORATION?

Ecological restoration includes a broad spectrum of activities involving a diverse group of scientific, technical, and social experts as well as qualified practitioners and volunteers focused on recovering ecosystem integrity and resilience. The most-cited definition of ecological or ecosystem restoration is provided by the SER International Primer on Ecological Restoration: *"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed."* – SER 2004

Ecological restoration projects and programs aim to reinstate degraded or lost ecosystem structure and function thereby fostering:

- The maintenance and recovery of biodiversity to protect, reinforce, and/or augment the delivery of vital goods and services;
- The realization of critical national and cultural priorities for sustainable socio-economic development and healthy livelihoods (SER IUCN 2004); and
- The mitigation of, and adaptation to, climate change impacts by recognizing the role that restored ecosystems play in carbon sequestration and climate protection (SER 2007).



The SER International Primer emphasizes the need to re-establish the historical trajectory of an impaired ecosystem with respect to its structure and function. However, it is generally recognized that many degraded ecosystems can no longer feasibly be restored to any particular pre-disturbance condition or ideal state. Cost-effective ecological restoration projects or programs manage or manipulate ecosystem variables (biotic and abiotic) to successfully enable the recovery of a mature, resilient ecosystem.

The SER International Primer outlines nine attributes of a restored ecosystem to further define and guide restoration efforts when confronting both biotic and abiotic barriers that can prevent or retard restoration success. These nine attributes provide a suite of benchmarks to be considered when projects and programs are monitored and evaluated (SER 2004). These include the presence of primarily native species, integration within the larger landscape matrix, and the reduction of potential external threats - all with the ultimate goal of having a self-sustaining ecosystem that is persistent, productive, and capable of adapting and evolving in a changing environment.

The practice of ecological restoration also gives priority to socio-economic and cultural needs, with the goal of re-establishing a healthy and sustainable relationship between nature and culture. This is especially critical for Indigenous peoples whose cultural survival is closely linked to historically important species and their habitats as well as

Biohabitats, Inc.

Biohabitats, Inc.

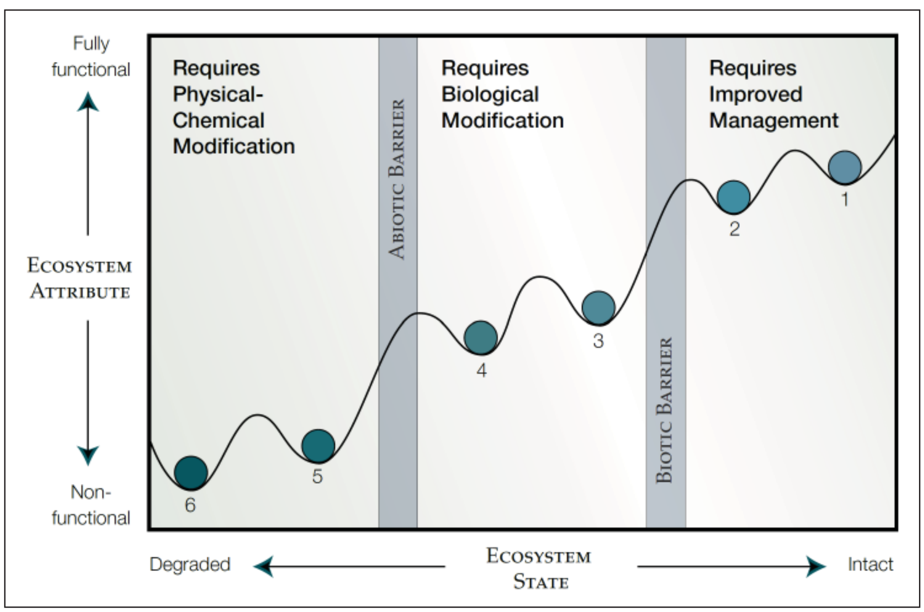
increased resilience in the face of climate change. These socio-economic and cultural goals are consistent with the Ecosystem Approach, as endorsed by the CBD, and have been highlighted by the IUCN Commission on Ecosystem Management (CEM): *"ecosystem restoration is key to the application of the Ecosystem Approach, e.g. in informing the negotiation of land use options, and in the enhancement of ecological networks"* – IUCN CEM 2009.

THE PRACTICE OF ECOLOGICAL RESTORATION

Ecological restoration is driven by the search for pragmatic solutions to environmental and human crises. It is a conscious intervention based on traditional or local knowledge, scientific understanding, and the recognition that what previously existed was precious and indeed necessary for the continued survival of many species, including humans. Strategic, integrated identification and implementation of conservation and restoration activities can help to assure the protection and recovery of species and ecosystems, and the ongoing delivery of ecological goods and services at levels required for a healthy planet. The cumulative impact of anthropogenic transformations to the landscape and other global changes make the need for investments in large-scale conservation and restoration all the more critical.

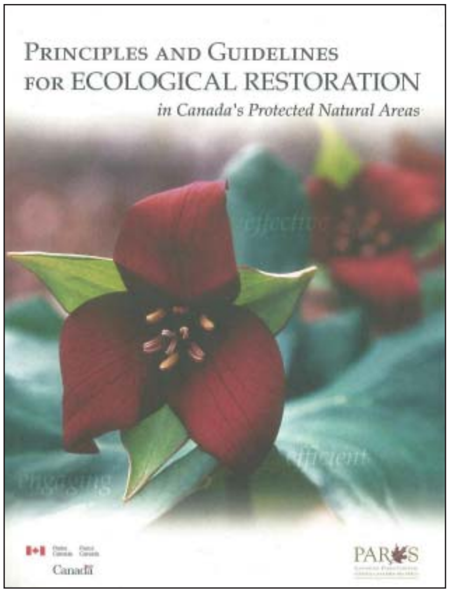
There are two types of primary barriers to restoration. An **abiotic barrier** prevents effective ecosystem functioning until key biophysical attributes are recovered (e.g. soil health, hydrological processes, and contaminant removal). Overcoming this barrier is often a critical first step in designing and implementing ecological restoration projects and programs. The **biotic barrier**, by contrast, requires the replacement or reinstatement of missing ecosystem components (e.g. species and ecological processes) (Hobbs and Harris 2001).

> *"Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed."*
>
> – Society for Ecological Restoration, 2004



Hobbs and Harris 2001; Parks Canada and the Canadian Parks Council 2008

Figure 1: Conceptual model for ecosystem degradation and restoration



UNDER WHAT CONDITIONS IS ECOLOGICAL RESTORATION APPROPRIATE?

Virtually any degraded habitat, site, or ecosystem warrants consideration for ecological restoration efforts, particularly when they form part of natural or cultural areas of importance. More specifically, ecological restoration projects and programs may be considered appropriate when any of various key ecosystem attributes (structural and/or functional) cross certain physical, chemical, or ecological thresholds and are thus outside their normal range of variability. Under these conditions, ecological restoration interventions can prevent or delay the transition of a measurable ecosystem attribute (e.g. species abundance and soil quality) across one of these thresholds in the first place or, if necessary, reverse a transition that has already occurred (e.g. species loss and chemical contamination). To do so effectively often requires adaptive management practices in order to respond to unexpected outcomes.

Decisions regarding the appropriateness of ecological restoration will vary with national socio-political realities and community or stakeholder priorities. Many individuals, organizations, and nations increasingly recognize that in order for ecological restoration projects and programs to be successful in achieving long-term positive outcomes for people and nature, they must be designed and implemented in such a way as to be **(1) effective**, ensuring ecological success, **(2) efficient**, being practical and affordable, and **(3) engaging**, enabling meaningful participation of indigenous and local communities which recognizes and embraces interrelationships between people, culture and nature.

At the IUCN World Conservation Congress (Barcelona 2008), members agreed that ecological restoration in protected areas should embrace these principles in striving to achieve enhanced biodiversity and increased ecosystem integrity and resilience in the face of agricultural expansion, urbanization, climate change and other global changes (IUCN motion CGR4.MOT051). As a result, the IUCN is currently developing best practice guidance for ecological restoration in protected areas that will likely be broadly applicable outside protected areas.

Flood Meadows before and after restoration Upper Rhine, Germany

ECOLOGICAL RESTORATION PROJECTS: METHODS AND TECHNIQUES FOR SUCCESS

When evaluating the success of restoration projects, it is important to recognize that certain ecosystems (e.g. boreal or montane forests, arid lands, and coral reefs) can take decades or centuries to restore while others (e.g. certain wetlands and grasslands, tropical forests) can be restored in months or years. While many ecological restoration projects strive for multiple outcomes – e.g. species recovery, ecological sustainability, and the restoration of services such as climate protection, water purification, and waste removal – often only a handful of proven methods or techniques are necessary to successfully bring about ecosystem restoration.

In the case of ecosystems degraded by invasive alien species, restoration techniques focus on eradication and native plantings and/or wildlife species reintroductions with the goal of allowing natural succession to resume a more desirable trajectory. The removal of invasive species from both terrestrial and aquatic ecosystems is well documented in the literature and presented in many case studies. Successful techniques range from manual to mechanized, biological to chemical depending on the species and ecosystem.

GLOBAL RESTORATION NETWORK

For terrestrial and aquatic ecosystems subjected to intense resource extraction such as agriculture, fisheries and mining, restoration techniques that focus on soils and sediments, water quality, seed banks, and hydrology play an important role in the recovery of structure and function. In such cases, ecological engineering, landscape architecture, and pre-disturbance planning often serve as the foundation for a successful project where a restored ecosystem is able to flourish within the overall landscape.

The following case studies represent a small sample of the many successful restoration projects that include the use of proven techniques. They are drawn from a database hosted by SER International's Global Restoration Network (GRN).

Mauritius: Forest Habitat Restoration in the Ile Aux Aigrettes Nature Reserve

Managed and leased by the Mauritian Wildlife Foundation (MWF), Ile aux Aigrettes is a 25-hectare island just off the southeast coast of mainland Mauritius that contains the last remnant of Mauritian coastal ebony forest. Exotic plant and animal species had driven the ecosystem to the brink of extinction by the 1980s, and it was then that MWF began its ongoing restoration program. Initial interventions included the removal of non-native plant species, revegetation with nursery-reared seedlings, and the eradication of rats, cats and mongooses. Several endemic and critically endangered species were subsequently reintroduced to the island, and diligent monitoring has reflected steadily increasing populations. Besides helping to conserve irreplaceable resources and safeguard Mauritius's natural heritage, MWF's work on Ile aux Aigrettes has made significant contributions to local livelihoods. Activities directly associated with the restoration effort have afforded employment and training opportunities, and the development and promotion of ecotourism on the newly restored island has generated additional income for local communities.

http://www.globalrestorationnetwork.org/database/case-study/?id=265

Australia: Returning the Botanical Richness of the Jarrah Forest in Restored Bauxite Mines in Western Australia

In the Jarrah Forest of Western Australia, Alcoa's aim after bauxite mining in these areas is to re-establish all the pre-existing land uses of the forest: conservation, timber production, water production and recreation. Re-establishing a jarrah forest on the mined areas that is as similar to the original forest as possible was determined to be the best way to achieve this goal. Alcoa has been successful in reaching its goal. In 2000, the company documented that, on average, 100 per cent of the indigenous plant species found in representative jarrah forest sites would also be found in a 15-month-old rehabilitation, with at least 20 per cent of those found being from a recalcitrant species priority list. Considerations for the mining operation directly related to human well-being are water catchment protection, loss of timber production, and impacts on local communities such as noise, dust and access to forest. All of these issues are addressed to some extent by a successful restoration effort.

http://www.globalrestorationnetwork.org/database/case-study/?id=141

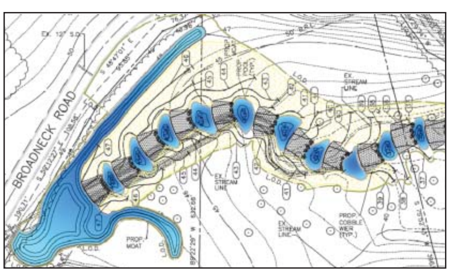
India: Mangrove Restoration in Andhra Pradesh

This mangrove restoration project was launched in Andhra Pradesh, India with the aim of inducing concerted action towards conservation and sustainable management of the mangrove wetlands on the east coast of India. The restoration employed canal techniques, instead of simple plantation of seedlings, and a fish bone pattern of canals was utilized. This fishbone design was shown to be a more efficient method of facilitating tidal flushing than the rectangular pattern used by the Forest Department. Thus, this technique has now been adapted and recommended by the Government of India for other restoration projects. The newly established water regime has benefited the livelihood of local communities by increasing the population of edible crabs in the restored areas growth of fodder grass for livestock. Providing alternate employment and income generating activities to the villagers depending directly on mangroves has also been an important aspect of this project.

http://www.globalrestorationnetwork.org/database/case-study/?id=60

GUIDELINES FOR IMPLEMENTING ECOLOGICAL RESTORATION PROJECTS

No two ecological restoration projects are ever exactly the same, even when implemented in similar ecosystems with comparable species assemblages. The SER International *Guidelines for Developing and Managing Ecological Restoration Projects* (SER 2005) offers a series of recommended steps to guide restoration practitioners and project managers through the process of conducting a successful ecological restoration project. Although project design is necessarily site-specific, the guidelines are applicable to the restoration of any ecosystem - terrestrial or aquatic - that may be undertaken anywhere in the world, be they public works projects, environmental stewardship programs, mitigation projects, private land initiatives, etc. Adherence to these guidelines will reduce problems that compromise project quality and effectiveness. Briefly, the phases for developing and managing a restoration project are:



Biohabitats, Inc.

Conceptual planning identifies the restoration project site, specifies its current state of health and the goals of restoration, and provides relevant background information including stakeholder involvement. Conceptual planning is conducted when restoration appears to be a feasible option but before a final decision has been made to exercise that option. Conceptual planning provides preliminary information on the habitat or ecosystem such as the identification of stressors, the extent/health of its connectivity to the larger landscape, the need for engineering and biotic interventions, and representative measurements and surveys.

Preliminary tasks are those upon which project planning depends. These tasks form the foundation for well-conceived restoration project design. Preliminary tasks include the documentation of existing site conditions (biotic and abiotic) including baseline measurements, the establishment of a reference model to guide the project work towards its intended goals, planning for experimental plots within the large project, and the appointment of a project manager and team with expertise in all aspects of the project. Restoration should not follow a monolithic, top-down plan that treats all projects the same and should encourage public and stakeholder participation whenever possible.

Biohabitats, Inc.

Biohabitats, Inc.

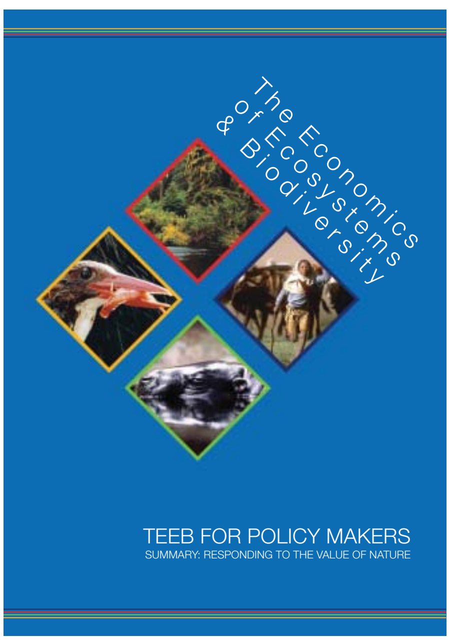
Implementation plans describe the tasks that will be performed to realize project objectives. These tasks collectively comprise the project design that includes all activities, treatments, and manipulations to be executed, including decisions to avoid intervention. Performance standards and monitoring protocols are typically part of the project design that allow for projects to be evaluated and subjected to adaptive management practices.

Project implementation is the phase in which tasks are executed according to the project design. Project boundaries are demarcated and monitoring equipment is setup. Site maintenance and protection are also important during the implementation phase. Adaptive management as a restoration strategy is highly recommended, if not essential, because what happens in one phase of project work can alter what was planned for the next phase. This applies to social, cultural and economic outcomes as well.

Evaluation and publicity are also critical components of a successful restoration project. Thorough assessments are periodically necessary to ensure the on-going fulfillment of project objectives and goals. However, monitoring, adaptive management practices and site maintenance must be ongoing. The project is publicized for public outreach as well as academic and professional feedback.

IS ECOLOGICAL RESTORATION COST EFFECTIVE?

Along with much-needed conservation measures, successful ecological restoration projects deliver direct socio-economic benefits to countries and communities, including public health, water quality, soil fertility, recreation, sanitation, and pollution control. These projects create jobs, revitalize local economies, encourage sustainable industries, bring together communities, lift morale and instill hope that habitats, landscapes, and ecosystems will once again be able to provide for future generations.



Ecological restoration is undoubtedly more expensive than avoiding damage in the first place. But once the damage is done, the long-term costs of not restoring critical habitat and ecosystems will dwarf short-term cost concerns as species extinction and ecosystem collapse imperil political and economic security. Just as mitigating and adapting to climate change will become more expensive in the future (Stern 2006, IEA 2009), so will the costs of restoration increase the longer we put it off (European Communities 2008). Furthermore, The Economics of Ecosystems and Biodiversity (TEEB) consortium asserts that ecosystem restoration is a good short-term investment when the total economic value of the ecological infrastructure (i.e. ecosystems and biodiversity) is taken into account (TEEB 2009). In other words, the benefits of restoration far outweigh the costs.

MEASURING THE BENEFITS OF ECOLOGICAL RESTORATION PROJECTS

In addition to site-specific opportunity costs, the proper accounting of externalities or downstream impacts associated with degradation would further validate the short-term costs of many restoration projects: e.g. activities that degrade or impair ecosystem functioning such as farm nutrient run-off creating dead zones in our rivers, lakes and oceans or the reclamation of ecologically important wetlands for industry and urban expansion. In an unpublished report, the United Nations estimated that in 2008 the largest 3,000 corporations caused US$2.2 trillion in environmental damage as a result of these externalities (Jowett 2010). In order to develop more accurate environmental impact assessments, comprehensive inventories of lost biodiversity and ecosystem goods and services must be developed and quantified.

Natural processes provide goods and services far more efficiently than people through engineering, analog infrastructure, and other methods of recreating provisioning services. A recent meta-analysis of 89 restoration projects concluded that on average these projects were able to increase ecosystem services by 25% and biodiversity by 44%, and that these results were positively correlated (Rey Benayas et al. 2009). In the developing countries, the World Resources Institute has calculated that US$1 spent on ecological restoration yields up to US$3 in economic benefits, and related projects, specifically targeting sanitation and water quality, can generate up to US$14 in benefits (WRI 2005). These benefits become further magnified in countries that have integrated environmental legislation (e.g. the Water Framework Directive of the European Union and the US EPA Clean Water Act of 1972, Clean Air Act of 1970 and Endangered Species Act of 1973).

The benefits of ecological restoration extend beyond the provision of goods and services that can be readily valued in monetary terms. In Tanzania, a woodland restoration project that began in 1986 has reforested over 350,000 hectares providing more than 800 villages with food, fuel, timber and medicine. The Tanzanian government and the IUCN have calculated the monthly economic benefit of restoration to be approximately US$14 per person (SARPN 2006).

Tanzania: Forest Restoration in the Shinyanga Region

In 1986, the government of Tanzania launched the Shinyanga Soil Conservation Programme (HASHI) with the aim of restoring severely degraded woodlands in the Shinyanga Region and providing local villagers access to important natural resources. Under this programme, the ngitili, a traditional resource management system, is being employed as the engine for remediation. Ngitilis are carefully managed tracts of land, held individually or communally, that are excluded from grazing during the wet season and then used for fodder at the peak of the dry season. The ngitili has been found to represent an easily instituted and highly effective means of investing villagers in the long-term goals of restoration and conservation and ensuring the cooperation of village institutions at all levels of planning and implementation.

http://www.globalrestorationnetwork.org/database/case-study/?id=95

East Creek before and after restoration
Larchmont, New York

APPROACHES TO REDUCE THE COST OF ECOLOGICAL RESTORATION PROJECTS

In many countries, profit or return on investment from activities such as agriculture, forestry, fisheries, tourism and extractive industries is often given the highest priority in economically productive ecosystems. In some countries, securing sustainable and healthy livelihoods for the community and biodiversity conservation are given precedence. While the costs of restoration projects are more easily subsumed by economically productive ecosystems, particularly when properly accounted for in environmental impact assessments, restoration has the potential to provide cross-sector benefits regardless of national priorities.

Community-based restoration projects are the most effective, efficient, and engaging approach to bring about ecologically-sustainable development and deliver direct socio-economic benefits at the local and regional level. By fostering stakeholder involvement and harnessing the energy of volunteers, these projects represent a bottom-up approach that cultivates environmental stewardship and enhances community sustainability. With guidance from experts and practitioners in the field, community-based restoration projects represent a low-cost approach to restoring vital ecosystem components and increasing broader-scale functionality and resilience.

Partnerships with the private sector are essential to restoring ecosystems under private ownership or management. Forestry professionals, for example, have the expertise, equipment and processing facilities that make restoration affordable and technically feasible. Private sector projects also provide significant employment in rural communities. Agro-ecological restoration projects offer another important opportunity for public-private collaboration. The integration of agricultural areas, and the recovery of transitional or buffer zones within a larger landscape restoration project can be achieved relatively inexpensively with sustainable agricultural practices.

Ecological restoration in protected areas is another potentially low-cost and politically feasible approach given that funding and management mechanisms are already in place. The re-establishment of healthy nodes or core areas and their biotic inter-linkages within a landscape matrix contribute significantly to both species and ecosystem integrity. It also makes sense for ecosystems adjacent to and connecting protected areas to be prime candidates for restoration and reintegration as expanded ranges, buffer zones, migration corridors, and stepping stone habitats will support species and ecosystem recovery in the face of climate change and other global changes. Such efforts also help countries meet biodiversity (Parks Canada and the Canadian Parks Council 2008) and reduced emissions targets. In protected areas alone, the TEEB consortium estimates that an investment of US$45 billion would result in ecosystem goods and services valued at US$5 trillion per year (TEEB 2009).

Payments for Ecosystem Services (PES) and other financial mechanisms offer hope for reducing or more equally distributing the costs of ecological restoration projects. PES programs provide incentives, in the form of compensation from end-users to farmers and landowners that protect and restore the flow of ecosystem goods and services. Although there are many reasons why countries implement PES programs, climate change mitigation, watershed services, and biodiversity conservation are by far the most common. When implementing these financial incentives, careful consideration must be given to the multiple benefits to biodiversity and communities as well as the potential distortions and negative downstream impacts.

Biohabitats, Inc.

THE ROLE OF ECOLOGICAL RESTORATION IN CLIMATE CHANGE POLICY

Biodiversity loss and climate change are inextricably linked. Conservation and restoration represent complementary approaches (SER 2008) which must be fully integrated within an overall climate change strategy given their important role in mitigation and adaptation (TEEB 2009; SCBD 2009). In addition to sequestering carbon and reducing greenhouse gas emissions, protected and restored ecosystems offer climate protection and are more resilient than degraded or impaired ones (European Communities 2008). Ecological restoration projects that expand biogeographic ranges, enhance transitional or buffer zones, and increase landscape connectivity would also facilitate the adaptive migration of vulnerable taxa.

International financial mechanisms, such as Reduced Emissions from Deforestation and Forest Degradation (REDD), along with sustainable management practices that enhance forest carbon stocks (i.e. REDD-plus), could, if adopted by the UNFCCC, incorporate ecological restoration techniques and guidance, and thus create synergies that would more effectively address climate change, poverty alleviation, and the loss of biodiversity and ecosystem goods and services simultaneously. These capacity-building mechanisms would provide much-needed incentives to help mobilize resources for the developing countries and contribute to the success of ecological restoration projects that not only reduce deforestation, but also actually augment natural forest, savanna, and woodland cover on a sustainable basis.

CONCLUSION

Ecological restoration is a practical strategy for recovering biodiversity and ecosystem goods and services at all scales. Just as important are the social, cultural and economic benefits that flow from restoration, such as when people reconnect with natural processes and livelihoods are revitalized. Recognizing the multiple benefits of ecological restoration projects and programs, in conjunction with a more accurate valuation of their costs and benefits, countries and communities around the world should consider immediate action and investments in restoration so as to reduce or eliminate the significantly higher costs forecast for the future. Such a paradigm shift will require imaginative and visionary leadership at all levels, along with considerable incentives and other financial mechanisms that support projects and programs to restore the natural systems on which life itself depends.

> *"Restoring the Earth will take an enormous international effort, one even larger and more demanding than the often-cited Marshall Plan that helped rebuild war-torn Europe and Japan. And such an initiative must be undertaken at wartime speed lest environmental deterioration translate into economic decline, just as it did for earlier civilizations that violated nature's thresholds and ignored its deadlines."* — *Lester Brown 2006*

REFERENCES CITED

Brown, L.R. 2006. Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble. Earth Policy Institute, Washington, DC.

European Communities. 2008. The economics of ecosystems and biodiversity: an interim report. Brussels, Belgium.

Hobbs, R.J. and J.A. Harris. 2001. Restoration ecology: Repairing the Earth's damaged ecosystems in the new millenium, Restoration Ecology 9: 239-246.

International Energy Agency (IEA). 2009. World Energy Outlook.

IUCN Commission on Ecosystem Management (IUCN CEM) – Thematic Group on Ecological Restoration Webpage. [accessed March 14, 2010] http://www.iucn.org/about/union/commissions/cem/cem_work/cem_restoration/

Jowett, J. 2010. "World's top firms cause $2.2tn of environmental damage, report estimates". The Guardian February 18, 2010. http://www.guardian.co.uk/environment/2010/feb/18/worlds-top-firms-environmental-damage

Millennium Ecosystem Assessment (MA). 2005. Ecosystems and Human Well-Being Synthesis. Island Press, Washington, DC.

Parks Canada and the Canadian Parks Council. 2008. Principles and Guidelines for Ecological Restoration in Canada's Natural Protected Areas. [accessed March 14, 2010] http://www.pc.gc.ca/eng/docs/pc/guide/resteco/index.aspx

Rey Benayas, J.M., A.C. Newton, A. Diaz, and J.M. Bullock. 2009. Enhancement of Biodiversity and Ecosystem Services by Ecological Restoration: A Meta-Analysis. Science 325: 1121-1124.

Secretariat of the Convention on Biological Diversity (SCBD). 2009. Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Technical Series No. 41, Montreal, Canada.

Society for Ecological Restoration International (SER) Science and Policy Working Group. 2004. The SER International Primer on Ecological Restoration. www.ser.org

Society for Ecological Restoration International (SER) and IUCN Commission on Ecosystem Management. 2004. Ecological Restoration, a means of conserving biodiversity and sustaining livelihoods. Society for Ecological Restoration International, Tucson, Arizona, USA and IUCN, Gland, Switzerland.

Society for Ecological Restoration International (SER) Science & Policy Working Group. 2005. Guidelines for Developing and Managing Ecological Restoration Projects, 2nd Edition. www.ser.org

Society for Ecological Restoration International (SER) Science and Policy Working Group. 2007. Ecological Restoration as a Tool for Mitigating and Adapting to Climate Change. Policy Position Statement, www.ser.org

Society for Ecological Restoration International (SER) Science and Policy Working Group. 2008. Opportunities for Integrating Ecological Restoration and Biological Conservation within the Ecosystem Approach. Briefing Note May 2008, www.ser.org

South African Regional Poverty Network. 2006. Management of Natural Resources Programme, Tanzania TAN-0092 (Final Evaluation). Ministry of Natural Resources and Tourism, Tanzania, and the Royal Norwegian Embassy, Dar es Salaam, Tanzania. http://www.sarpn.org.za/documents/d0002832/index.php

Stern Review on the Economics of Climate Change. 2006. UK Office of Climate Change. http://www.hm-treasury.gov.uk/stern_review_report.htm

TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers 2009. http://www.teebweb.org/ForPolicymakers/tabid/1019/language/en-US/Default.aspx

World Resources Institute. 2005. The Wealth of the Poor: Managing Ecosystems to Fight Poverty. WRI, Washington DC. http://www.wri.org/publication/world-resources-2005-wealth-poor-managing-ecosystems-fight-poverty

SOCIETY FOR ECOLOGICAL RESTORATION INTERNATIONAL (SER)
Science & Policy Working Group
285 West 18th Street, Suite 1 • Tucson, Arizona 85701 USA
tel: 520-622-5485 • e-mail: info@ser.org • website: www.ser.org

This information note was prepared by the SER Science & Policy Working Group (SPWG). The SPWG would like to acknowledge the valuable assistance of Karen Keenleyside of Parks Canada and Keith Bowers of Biohabitats, Inc. in the preparation of this note. SER is an international non-profit organization whose mission is to promote ecological restoration as a means to sustaining the diversity of life on Earth and reestablishing an ecologically healthy relationship between nature and culture. Infused with the energy of involved members around the world – individuals and organizations actively engaged in the ecologically sensitive repair and management of ecosystems – SER is the world's advocate for ecological restoration. The SER Science & Policy Working Group promotes excellence in scientific research and contributes to the policy dialogue on ecological restoration as a conservation and sustainable development tool.