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Item 9 of the provisional agenda*

AVAILABLE GUIDANCE AND GUIDELINES ON ECOSYSTEM RESTORATION

Note by the Executive Secretary

INTRODUCTION

1. The Executive Secretary is circulating herewith, for the information of participants in the eleventh meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity, an annotated compilation of publically available documents on ecosystem restoration guidance and guidelines.

2. The present note addresses paragraphs 2 (a) and (b) of recommendation XV/2, in which the SBSTTA requested the Executive Secretary, subject to availability of funding, in collaboration with relevant international organizations and other partners to initiate work to:

(a) Compile the information on practical guidance or guidelines developed by government agencies, non-governmental organizations, private sector, indigenous and local communities, and academic and research institutions for the restoration of specific landscapes, ecosystems, habitats, and their components; and identify gaps, if any, and suggest ways for filling those gaps;

(b) Consolidate the existing guidance to address the needs of, and prepare materials for different targeted end-users such as policymakers, implementing agencies, and on-the-ground practitioners, including indigenous and local communities.

3. The Executive Secretary, with the generous funding from the European Union, commissioned the Society for Ecological Restoration (SER), in collaboration with relevant partners and organizations, to collate and compile the required information. SER in collaboration with the IUCN World Commission on Protected Areas (WCPA), the IUCN Commission on Ecosystem Management (CEM), the Global Partnership on Forest Landscape Restoration (GPFLR), the Society of Wetland Scientists (SWS), the World Resources Institute (WRI), the Botanic Gardens Conservation International (BGCI) and other related organizations, including the United Nations Convention to Combat Desertification (UNCCD) and the Ramsar Convention on Wetlands, through reaching out to their members/networks, prepared this note.

* UNEP/CBD/COP/11/1.

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

Annotated Compilation of Publically Available Documents on Ecosystem Restoration Guidance and Guidelines

Table of Contents

1. Introduction

The Society for Ecological Restoration (SER) defines ecosystem or ecological restoration as "the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed" (SER 2004).This definition is sufficiently broad to encompass a wide variety of approaches to reversing ecosystem degradation across a wide spectrum of contexts. It refers not only to activities aimed at returning an ecosystem to its pre-disturbance conditions, insofar as possible, but also to rehabilitation and other activities focused on the recovery of biodiversity, ecosystem functioning, or other indicators of ecological health. It does not however include afforestation, reforestation for the sole purpose of timber production or carbon sequestration, garden and landscape design, or the creation of ecosystems, all of which often ignore historical continuity as a guideline for restoration planning and execution.

It is also important to understand that ecological restoration is a "process of assisting" that involves gradual changes in order to fulfill a long-term commitment and vision. It is not a one-time intervention, like planting trees on barren lands or removing dams from rivers and streams. Activities such reclamation, remediation, revegetation, ecological engineering, etc., are often important first steps or components of restoration projects and programs, but when implemented in isolation or seen as ends in of themselves, these activities do not constitute ecological restoration as defined here. To further distinguish ecological restoration from other related activities that address environmental degradation, it is essential to recognize that the object being restored or recovered is an ecosystem, not an individual species nor the habitat of any one species. In addition to recovering ecosystem functionality and the flow of ecosystem services, the science and practice of ecological restoration also fosters a healthy relationship between humans and the environment by reinforcing the link between nature and culture and highlighting the important benefits that ecosystems provide to humans.

At the 15th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), the Secretariat issued an Information Note on Agenda Item 3.2 suggesting a number of recommendations on the "Ways and Means to Support Ecosystem Restoration" (UNEP/CBD/SBSTTA/15/4). In response, the SBSTTA adopted the following recommendations and this Information Note fulfills the request made by the Parties in UNEP/CBD/SBSTTA/REC/XV/2- Section I, Para 2 (a) and (b) which asks the Executive Secretary to initiate work to:

> (a) Compile the information on practical guidance or guidelines developed by government agencies, non-governmental organizations, private sector, indigenous and local communities, and academic and research institutions for the restoration of specific

landscapes, ecosystems, habitats, and their components; and identify gaps, if any, and suggest ways for filling those gaps;

(b) Consolidate the existing guidance to address the needs of and prepare materials for different targeted end users such as policymakers, implementing agencies, and on-the-ground practitioners, including indigenous and local communities;

This Information Note was produced by the Society for Ecological Restoration (SER) in collaboration with the IUCN World Commission on Protected Areas (WCPA), the IUCN Commission on Ecosystem Management (CEM), the Global Partnership on Forest Landscape Restoration (GPFLR), the Society of Wetland Scientists (SWS), the World Resources Institute (WRI), the Botanic Gardens Conservation International (BGCI) and other related organizations, including the UN Convention to Combat Desertification (UNCCD) and the Ramsar Convention on Wetlands.

For the purposes of this Information Note, 'guidance' and 'guidelines' are defined as instruction, advice or direction that explains the fundamental principles of ecosystem restoration as they relate to specific ecosystems, landscapes, economic sectors, and other related management issues. The guidance and guidelines presented here were selected using knowledge-based criteria, recognizing that the unifying principles of ecology and ecosystem management are most effective in guiding the best practice for restoring degraded ecosystems and landscapes, including the establishment of goals, the prioritization of restoration activities and their design and planning, biophysical interventions and manipulations, monitoring and adaptive management, and long-term ecosystem maintenance.

Each publically available document is presented in an annotated bibliography format which includes a short abstract or summary, language(s) in which the document is available, and an indication of primary targeted end-users as well as a citation or reference with weblink (URL). It is important to note that the abstract or summary does not include an assessment of the document's value or quality and unless otherwise indicated, the document is available only in the language presented.

Although this information document is not an exhaustive compilation, every effort has been made to present a representative range of guidance and guidelines that are publically available from a wide variety of organizations and individuals. Section 2 contains general guidance and guidelines applicable to all ecosystems and landscapes, while Section 3 contains ecosystem-specific guidance and guidelines. Section 4 focuses on landscape-scale guidance and guidelines, and Section 5 provides sector-specific guidance and guidelines. Annex 1 contains a preliminary gap analysis that identifies the current gaps in publically available guidance and guidelines on ecosystem restoration and suggests ways of filling those gaps.

As the field of ecological restoration has advanced rapidly in the last decade, the vast majority of the documents cited in this Information Note were published after the year 2000. However, a few older documents have also been included as they represent seminal works that still have relevance today. The hope is that this compilation will continue into the future and that a "living" database will be created to ensure the inclusion of new and valuable resources, and to provide the greatest ease of access for those interested in all aspects of ecosystem restoration.

This compilation is intended to focus, inform and direct decision-makers and stakeholders in the public, private and NGO sectors in their efforts to develop and manage ecosystem restoration projects and programs in a full range of geographic, socio-economic, and political contexts. It is important to bear in mind that ecosystem restoration guidance and guidelines can often be quite diverse with regard to their level of specificity, technical depth, ecosystem and degradation context, and targeted end-user, and the resources cited herein should therefore not be taken as blueprints without adapting them to the appropriate, site-specific circumstances.

It is also important to note that although ecosystem restoration can clearly play an important role in enhancing biodiversity and recovering ecosystem services, it should not be considered to be a substitute for protecting, conserving and sustainably managing ecosystems, landscapes, and all forms of natural capital. The potential to restore an ecosystem that has been degraded does not in any way justify continued degradation, as experience shows that a "restored" ecosystem rarely provides the full range and magnitude of services delivered by an undisturbed or intact ecosystem. Even when restoration is ecologically and economically feasible, it may take decades or even centuries. Therefore, given that all human societies and economies ultimately depend on natural capital, the priority must be to conserve and sustainably manage relatively intact ecosystems of all kinds, rather than to condone or ignore their continued degradation when feasible and sustainable alternatives are now available.

2. General Guidance and Guidelines

SER Primer on Ecological Restoration

The SER Primer employs a conceptual framework to provide structure for the fundamental principles of ecological restoration in any ecosystem or landscape. This framework and the ideas embedded within it reflect the unifying principles of ecology and ecosystem management that form the basis of our understanding, planning, and execution of restoration activities. The SER Primer uses common language to explain these principles, communicate their complexity, and help connect knowledge with practice in diverse socio-ecological systems.

Policymakers, implementing agencies

English, French, Spanish, Portuguese, Italian, Chinese

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

http://www.ser.org/content/ecological_restoration_primer.asp

Ecological Restoration: A Means of Conserving Biodiversity and Sustaining Livelihoods

This paper was produced by a joint working group of the Society for Ecological Restoration (SER) and the IUCN Commission on Ecosystem Management. The primary motivation for this paper has been to establish a joint rationale for both organizations as to why ecological restoration is a critical tool for biodiversity conservation and sustainable development. Much of this document was derived from the SER International Primer on Ecological Restoration (SER 2002 & 2004). The paper has been also been written to further the Principles of the Ecosystem Approach as endorsed by the Convention on Biological Diversity.

Policymakers

Society for Ecological Restoration 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.

https://www.ser.org/pdf/Global_Rationale.pdf

SER Guidelines for Developing and Managing Ecological Restoration Projects

This document describes the procedures for conducting ecological restoration in accord with the norms of the discipline that were established in the SER Primer. Each procedure is stated in terms of a guideline that leads restoration practitioners and project managers stepwise through

the process of ecological restoration. Adherence to these 51 guidelines will reduce errors of omission and commission that compromise project quality and effectiveness. The guidelines are applicable to the restoration of any ecosystem—terrestrial or aquatic—that is attempted anywhere in the world and under any auspices, including public works projects, environmental stewardship programs, mitigation projects, private land initiatives, etc. Users of the Guidelines are advised to become familiar with the SER Primer in advance and refer to it for definitions of terms and discussions of concepts.

Implementing agencies, practitioners

English, Portuguese, Italian

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

http://www.ser.org/content/guidelines_ecological_restoration.asp

Motivations for the Restoration of Ecosystems

The reasons ecosystems should be restored are numerous, disparate, generally understated, and commonly underappreciated. We offer a typology in which these reasons—or motivations—are ordered among five rationales: technocratic, biotic, heuristic, idealistic, and pragmatic. Three recent examples are given of restoration that blends the technocratic, idealistic, and pragmatic rationales and demonstrates the potential for a more unified approach. The biotic and heuristic rationales can be satisfied within the contexts of the other rationales.

Policymakers, implementing agencies

Clewell, A.F. and J. Aronson (2006) Motivations for the Restoration of Ecosystems. Conservation Biology 20(2): 420-428.

http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2006.00340.x/abstract

Handbook of Ecological Restoration: Volume1, Principles of Restoration and Volume 2, Restoration in Practice

The two volumes of this handbook provide a comprehensive account of the emerging and vibrant science of the ecological restoration of both habitats and species. Ecological restoration aims to achieve complete structural and functional, self-maintaining biological integrity following disturbance. In practice, any theoretical model is modified by a number of economic, social and ecological constraints. Consequently, material that might be considered as

rehabilitation, enhancement, re-construction or re-creation is also included. Volume 1 defines the underlying principles of restoration ecology, in relation to manipulations and management of the biological, geophysical and chemical framework. Volume 2 provides details of state-of-the-art restoration practice in a range of biomes within terrestrial and aquatic ecosystems.

Practitioners, implementing agencies

Perrow, M.R. and A.J. Davy (eds.) (2009) Handbook of Ecological Restoration: Volume1, Principles of Restoration and Volume 2, Restoration in Practice. Cambridge University Press

http://www.cambridge.org/gb/knowledge/isbn/item5706652/?site_locale=en_GB

http://www.cambridge.org/aus/catalogue/catalogue.asp?isbn=9780521047753

Ecological Restoration Principles, Values, and Structure of an Emerging Profession

This book offers for the first time a unified vision of ecological restoration as a field of study, one that clearly states the discipline's precepts and emphasizes issues of importance to those involved at all levels. In a lively, personal fashion, the authors discuss scientific and practical aspects of the field as well as the human needs and values that motivate practitioners. The book: 1) identifies fundamental concepts upon which restoration is based, 2) considers the principles of restoration practice, 3) explores the diverse values that are fulfilled with the restoration of ecosystems, and 4) reviews the structure of restoration practice, including the various contexts for restoration work, the professional development of its practitioners, and the relationships of restoration with allied fields and activities.

Practitioners, implementing agencies

English, French

Clewell, A.F. and J. Aronson (2007) Ecological Restoration Principles, Values, and Structure of an Emerging Profession. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/E/bo7019370.html

Underlying Principles of Restoration

The term restoration is used in many ways; however, it normally implies return to an original state. In ecological restoration, it should be thought of as applying to whole ecosystems. It must be remembered that options, such as rehabilitation or replacement, exist that may be more practicable than restoration. The components of restoration are the chemical and physical aspects of the habitat and the species themselves. Each of these may require specific treatment, but natural restorative processes should be used wherever possible; in fact, natural

processes may be sufficient once the degrading influences have been removed. Because the process of restoration is progressive, the criteria of success are not easy to define. The most important point is that ecosystem development should be on an unrestricted upward path. From this, it follows that successful restoration is a serious test of our ecological understanding.

Policymakers, implementing agencies, practitioners, indigenous and local communities

Bradshaw, A.D. (1996) Underlying Principles of Restoration. Canadian Journal Fisheries and Aquatic Sciences 53(s1): 3-9.

http://www.cnr.usu.edu/streamrestoration/files/uploads/Bradshaw,%20A.D..pdf

Ecological Restoration

Ecological Restoration provides a comprehensive overview of the strategies being used around the world to reverse human impacts to landscapes, ecosystems, and species. This book aims to improve the outcomes of restoration practice by strengthening the connections between ecological concepts and real-world decision-making: students explore each topic considering both research-based knowledge and lessons learned from nineteen actual restorations. Details of these ecological restorations, from underwater reefs to mines in hot deserts, are woven into each chapter, presented as case studies, and used in exercises.

Policymakers, implementing agencies

Galatowitsch, S.M. (2012) Ecological Restoration. Sinauer, Sunderland, MA.

http://www.sinauer.com/detail.php?id=6076

Recuperación de Espacios Degradados

El libro es de utilidad para quienes estén relacionados con las diversas formas de la gestión ambiental; en particular se pueden beneficiar de él las empresas cuyas actividades generen espacios degradados: constructoras, mineras, industriales, turísticas, agrícolas, etc., los profesionales interesados en afrontar y proyectar el tratamiento y las empresas de consultoría e ingeniería que incluyan la recuperación en su campo de actividad, etc., asimismo es útil como libro de apoyo y de consulta para numerosas carreras universitarias o cursos de postgrado.

Implementing agencies, practitioners

Gómez-Orea, D. (2004) Recuperación de Espacios Degradados. Mundi-Prensa, Madrid, Spain.

http://www.mundiprensa.com/catalogo/9788484762119

Introduction to Restoration Ecology

Developed by ecologists and landscape architects, each of whom has been involved in restoration research and practice for many years, the focus of the book is on providing a framework that can be used to guide restoration decisions anywhere on the globe, both now and in the future.

Practitioners, implementing agencies, indigenous and local communities, policymakers

Howell, E.A., J.A. Harrington and S.B. Glass (2011) Introduction to Restoration Ecology. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/I/bo8008310.html

Australia

Rehabilitation of Terrestrial Ecosystems

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process and effective environmental management. The Guidance Statements assist proponents to achieve environmentally acceptable proposals and management plans. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to take all reasonable and practicable measures to protect the environment and to view the requirements of this Guidance as representing the minimum standards necessary for rehabilitation of ecosystems. This document is also designed to assist proponents to meet requirements of environmental auditing of completion criteria for such projects.

Implementing agencies

Environmental Protection Authority (2006) Rehabilitation of Terrestrial Ecosystems. Guidance for the Assessment of Environmental Factors Western Australia No. 6.

http://epa.wa.gov.au/EPADocLib/2184_GS6.pdf

Restoring Natural Areas in Australia

A new, practical handbook for managing natural areas covering all aspects of managing natural area restoration projects which includes resilience, mapping, describing and assessing vegetation as well as techniques for managing weeds, fire and responding to climate change.

Practitioners, implementing agencies, indigenous and local communities

Buchanan, R. (2009) Restoring Natural Areas in Australia. NSW Government, Department of Primary Industries.

http://www.dpi.nsw.gov.au/aboutus/resources/bookshop/restoring-natural-areas

Canada

Ground Work: Basic Concepts of Ecological Restoration in British Columbia

Ecological restoration attempts to restore parcels of land or water that have been damaged by a range of past human activities. The scope of ecological restoration ranges from alpine meadows to saltwater estuaries, and the techniques are as diverse as the many ecosystems to which they are applied. This guide provides an introduction to ecological restoration for individuals, companies, students, non-profit groups, and government agencies involved in or contemplating restoration projects. It emphasizes the underlying concepts common to all restorations—the ecological concepts of succession, disturbance, and historical range of variability.

Practitioners, implementing agencies, policymakers, indigenous and local communities

Gayton, D.V. (2001) Ground Work: Basic Concepts of Ecological Restoration in British Columbia. Southern Interior Forest Extension and Research Partnership, Kamloops, B.C. SIFERP Series 3.

http://trench-er.com/public/library/files/ground-work-basic-concepts-restoration.pdf

Ecological Restoration Guidelines for British Columbia

This document gives guidance on developing and implementing restoration projects. These guidelines are designed to inform and guide groups undertaking restoration programs, regardless of funding source or type of project. Because every restoration site is different, the emphasis is on identifying important components common to all restoration projects, and on providing suggestions for finding resources and developing project-specific plans. By using these guidelines, your group will be able to set appropriate and measurable restoration goals, and develop a restoration plan that will define short- and long-term activities. Developing these restoration goals and plans will not only make for a sound project, but will also assist in obtaining restoration funding.

Implementing agencies, policymakers

Douglas, T. (2002) Ecological Restoration Guidelines for British Columbia. Terrestrial Ecosystem Restoration Program. Forest Investment Account. BC Ministry of Forests. Victoria, BC.

http://www.env.gov.bc.ca/fia/documents/restorationguidelines.pdf

Colombia

Guías Técnicas para la Restauración Ecológica de Ecosistemas

El presente documento se divide en cuatro partes, en la primera parte se explican los pasos más comunes que siguen los proyectos de restauración, con explicaciones conceptuales que contribuyen a la comprensión de los procesos, procedimientos y técnicas. La segunda parte presenta la guía técnica para la restauración ecológica de ecosistemas terrestres, comenzando con los páramos y ecosistemas boscosos (húmedos, secos y andinos), posteriormente se presentan las sabanas y finalmente las zonas áridas. En la tercera parte se desarrollan los ecosistemas acuáticos, primero se hace una introducción general dadas las particularidades de estos ecosistemas y posteriormente se desarrollan las guías técnicas para la restauración de humedales, ríos y bosques riparios. En la cuarta y última parte se presentan los ecosistemas costeros con énfasis en manglares, corales y praderas de pastos marinos. Esta parte inicia, como la anterior, con una introducción general a la particularidad de los ecosistemas costeros.

Practitioners, implementing agencies

Vargas Rios, O., S.P. Reyes Bejarano, P.A. Gomez Ruiz and J.E. Diaz Triana (2010) Guías Técnicas para la Restauración Ecológica de Ecosistemas. Convenio de Asociación No.22 entre Ministerio de Ambiente, Vivienda y Desarrollo Territorial (MAVDT) y Academia de Ciencias Exactas, Físicas y Naturales (ACCEFYN).

http://www.minambiente.gov.co/documentos/DocumentosBiodiversidad/proyectos_norma/proyectos/230910_guia_tec_res_eco.pdf

Manual para la Restauración Ecológica de los Ecosistemas Disturbados del Distrito Capital

Luego de la segunda edición del Protocolo Distrital de Restauración Ecológica en el año 2002, la Secretaría Distrital de Ambiental en asocio con la Pontificia Universidad Javeriana se dio a la tarea de elaborar el presente Manual de Restauración Ecológica de los Ecosistemas Disturbados del Distrito Capital, buscando aportar elementos técnicos para la actualización, el aprendizaje, la reflexión y el análisis de las prácticas desarrolladas para la restauración de áreas de interés ecológico y ambiental tanto en la zona rural como urbana.

Implementing agencies, practitioners

Barrera-Cataño, J.I., S.M. Contreras-Rodríguez, N.V. Garzón-Yepes, A.C. Moreno-Cárdenas and S.P. Montoya-Villarreal (2010) Manual para la Restauración Ecológica de los Ecosistemas Disturbados del Distrito Capital. Secretaría Distrital de Ambiente (SDA), Pontificia Universidad Javeriana (PUJ). Bogotá, Colombia.

http://ambientebogota.gov.co/documents/10157/73753/Manual+para+la+restauraci%C3%B3n+ecol%C3%B3gica+de+los+ecosistemas+disturbados+del+Di?version=1.1

Guatemala

La Restauración Ecológica: Conceptos y Aplicaciones

La presente revisión del tema tiene como objetivo describir la importancia de los procesos de restauración ecológica en respuesta al deterioro de los mismos, así como describir los distintos mecanismos que pueden conducir a la restauración de un área, sus principios, sus problemas y los resultados obtenidos en algunas experiencias concretas. Todo ello en el marco de la biología de la conservación como disciplina que provee principios y herramientas para preserver la diversidad biológica a través de la comprensión de la naturaleza de las especies y su sitio en el ecosistema.

Practitioners, implementing agencies

Gálvez, J. (2002) La Restauración Ecológica: Conceptos y Aplicaciones. Serie de documentos técnicos No. 8, Universidad Rafael Landivar, Guatemala.

http://biblio3.url.edu.gt/IARNA/SERIETECNINCA/8.pdf

India

Ecological Restoration: Foundation for Ecological Security Internal Sourcebook

The crux of our efforts lies in locating forests and other natural resources within the prevailing economic, social and ecological dynamics in rural landscapes and in intertwining principles of conservation and local self governance for the protection of the natural surroundings and improvement in the living conditions of the poor. By working on systemic issues that can bring about a multiplier change, we strive for a future where the local communities determine and move towards desirable land use that is based on principles of conservation and social justice.

Practitioners, implementing agencies, indigenous and local communities

Foundation for Ecological Security (2008) Ecological Restoration: Foundation for Ecological Security Internal Sourcebook. Foundation for Ecological Security, Gujarat, India.

http://www.fes.org.in/source-book/ecological-restoration-source-book.pdf?file=ZG93bmxvYWQvd3AxOS5wZGY=?file=ZG93bmxvYWQvd3AxOS5wZGY=

Japan

The Restoration of Nature in Japan: A Challenge to Ecological Engineering

The book describes in great detail a multitude of community-based projects run by engineers and biologists. These projects, carried out mostly on public lands, in general seem more concerned with ecological engineering than with ecological restoration. Conservation of biological diversity in the context of a social movement seeking development of a new relation between society and nature is the driver of these projects, which is also the case for the restoration movement in North America. The primary motivation of several of the case studies presented is the engineered creation of habitat for particular species (e.g., giant salamanders [Andrias japonicas] and Japanese Golden Eagles [Aquila chrysaetos japonica]) or the reconnection and enhancement of habitat for wild animals. Maintaining particular types of cultural landscapes, such as managed woodlands or traditional rice fields, in close proximity to cities is also discussed as is the challenge of restoring areas of "primeval nature" in national parks and controlling nonnative organisms.

Implementing agencies, practitioners

Hirose, T. (2010) The Restoration of Nature in Japan. A Challenge to Ecological Engineering. Tokai University Press, Kanagawa.

http://www.a-rr.net/jp/en/book/02river_restoration/2196.html

Mexico

Temas sobre Restauración Ecológica

Temas sobre restauración ecológica es el cuarto libro de una serie iniciada en 1999, que abarca diferentes temas vinculados con la conservación y el manejo adecuado de la vida silvestre y de los ecosistemas, con énfasis en los contextos mexicano y latinoamericano. En este trabajo, un grupo de especialistas de diversas instituciones aporta conceptos, métodos y técnicas acerca de uno de los procesos cruciales en la ecología y el manejo de los recursos naturales: la restauración ecológica.

Practitioners, implementing agencies

Sánchez, O., E.P. Recagno, R. Márquez-Huitzil, E. Vega, G. Portales, M. Valdés and D. Azuara (eds.) (2005) Temas sobre Restauración Ecológica. Instituto Nacional de Ecología, Secretaría de Medio Ambiente y Recursos Naturales, México, D.F.

http://www2.ine.gob.mx/publicaciones/consultaPublicacion.html?id_pub=467

New Zealand

Guidelines to the Development and Monitoring of Ecological Restoration Programmes

This report provides some guidelines for maximising the biological effectiveness, and therefore the cost effectiveness, of terrestrial restoration programmes undertaken by the Department of Conservation. It is concerned mainly with principles.

Implementing agencies, practitioners

Atkinson, I.A.E. (1994) Guidelines to the development and monitoring of ecological restoration programmes. Wellington, NZ: Dept. of Conservation.

http://www.doc.govt.nz/upload/documents/science-and-technical/docts07.pdf

Protecting and Restoring our Natural Heritage - A Practical Guide

By bringing together detailed information and project experiences, this guide will help community groups, local bodies and individuals to initiate projects, and make best use of resources to protect and restore our native plants and ecosystems.

Practitioners, implementing agencies

Davis, M. and C. Meurk (2001) Protecting and restoring our natural heritage - A practical guide. New Zealand Department of Conservation.

http://www.doc.govt.nz/publications/conservation/protecting-and-restoring-our-natural-heritage-a-practical-guide/

USA

Ecological Principles and Guidelines for Managing the Use of Land

Five principles of ecological science have particular implications for land use and can assure that fundamental processes of Earth's ecosystems are sustained. These ecological principles deal with time, species, place, disturbance, and the landscape. The recognition that ecological processes occur within a temporal setting and change over time is fundamental to analyzing the effects of land use. In addition, individual species and networks of interacting species have strong and far-reaching effects on ecological processes. Furthermore, each site or region has a unique set of organisms and abiotic conditions influencing and constraining ecological processes. Disturbances are important and ubiquitous ecological events whose effects may strongly influence population, community, and ecosystem dynamics. Finally, the size, shape, and spatial relationships of habitat patches on the landscape affect the structure and function of ecosystems. The responses of the land to changes in use and management by people depend

on expressions of these fundamental principles in nature. These principles dictate several guidelines for land use.

Policymakers, implementing agencies

Dale, V.H., S. Brown, R.A. Haeuber, N.T. Hobbs, N. Huntly, R.J. Naiman, W.E.Riebsame, M.G. Turner and T.J. Valone (2000) Ecological Principles and Guidelines for Managing the Use of Land. Ecological Applications 10(3): 639-670.

http://fish.washington.edu/people/naiman/contemporary/papers/dale.pdf

http://www.epa.gov/owow/watershed/wacademy/acad2000/pdf/landuseb.pdf

GNPS Habitat Restoration Manual

This manual is intended to be a guide for individuals and groups who have seen the beauty and diversity of native plants and their habitats and who want to recreate a native habitat or to restore one to its natural condition. We have based this manual on standard professional practices, but we have modified them in order to make them more accessible to non-professionals.

Practitioners, indigenous and local communities

Georgia Native Plants Society

http://www.gnps.org/restoration/Documents/GNPS_Habitat_Restoration_Guidelines.pdf

3. Ecosystem-Specific Guidance and Guidelines

Coastal/Marine

Systematic Approach to Coastal Ecosystem Restoration

The goal of this paper is to present a framework that has proven to be effective and efficient in coastal restoration projects, providing a common approach for people working together for coastal restoration and helping to bridge the gap between scientists and the interested public. It is hoped that this framework will be useful to the partnerships that have proven to be important to many restoration projects, often involving local volunteers as well as personnel from governmental agencies and nongovernmental organizations (NGOs) with varying backgrounds in restoration ecology. It is intended as a review and guide for environmental planners, regulatory personnel, engineers, consultants, college students, and others involved in coastal restoration projects or planning. It may also be of interest to researchers in the field of restoration ecology and conservation biology.

Implementing agencies, practitioners

Diefenderfer, H.L., R.M. Thom and J.E. Adkins (2003) Systematic Approach to Coastal Ecosystem Restoration. Prepared for National Oceanic and Atmospheric Administration, Coastal Services Center by Battelle Marine Sciences Laboratory.

http://www.ser.org/sernw/pdf/NOAA_systematic_coastal_restoration.pdf

Guidelines, Processes and Tools for Coastal Ecosystem Restoration, with Examples from the United States

This paper presents a systematic approach to coastal restoration projects with five components: planning, implementation, performance assessment, adaptive management, and dissemination of results. Typical features of the iterative planning process are synthesized, beginning with a vision, a description of the ecosystem and landscape, and goals. The conceptual model and planning objectives are developed, prioritization techniques are used for site selection, and numerical models contribute to preliminary designs as needed. Within the planning process, cost analysis involves budgeting, scheduling, and financing. Performance criteria and reference sites are selected during design of the monitoring program. Particular emphasis is given to the monitoring program, used as a tool to assess project performance and identify problems affecting progression toward project goals, within an adaptive management framework. Key approaches to aspects of the monitoring program are reviewed and detailed with project examples.

Implementing agencies

Thom, R.M., H.L. Diefenderfer, J.E. Adkins, C. Judd, M.G. Anderson, K.E. Buenau, A.B. Borde and G.E. Johnson (2010) Guidelines, processes and tools for coastal ecosystem restoration, with examples from the United States. Plankton and Benthos Research 5 (Supplement): 185-201.

http://tidalmarshmonitoring.org/pdf/Thom2010_GuidelinesProcessesToolsCoastalEcosystemRestoration.pdf

Coastal/Marine>Coral Reefs

Reef Restoration Concepts and Guidelines

These guidelines contain simple advice on coral reef restoration for coastal managers, decision makers, technical advisers and others who may be involved in community-based reef restoration efforts. Those attempting reef restoration need to be aware that there is still much uncertainty in the science underpinning restoration, not least due to the great complexity of reef ecosystems. Much scientific research is currently underway around the world to address these gaps in our knowledge and improve our understanding of what reef restoration interventions can and cannot achieve. Despite these uncertainties there are many useful lessons which can be learned from previous work both in terms of what works and what doesn't work. The following guidelines seek to summarise these lessons in a succinct form for practitioners so that they may have a clearer idea of what can and cannot be achieved by reef restoration and can set goals and expectations accordingly.

Practitioners, implementing agencies

English, French, Spanish, Bhasa Indonesia

Edwards, A.J. and E. Gomez (eds.) (2007) Reef Restoration Concepts and Guidelines: making sensible management choices in the face of uncertainty. Coral Reef Targeted Research & Capacity Building for Management Programme: St Lucia, Australia.

http://www.gefcoral.org/Publications/tabid/3260/language/en-US/Default.aspx

Reef Rehabilitation Manual

This Reef Rehabilitation Manual is intended to complement the Reef Restoration Concepts & Guidelines and provide more detailed hands-on advice, based on lessons-learnt from previous experience, on how to carry out coral reef rehabilitation in a responsible and cost-effective manner. The two booklets should be used together.

Practitioners

Edwards, A.J. (ed.) (2010) Reef Rehabilitation Manual. Coral Reef Targeted Research & Capacity Building for Management Program: St Lucia, Australia.

http://www.gefcoral.org/Publications/tabid/3260/language/en-US/Default.aspx

Coral Reef Restoration Handbook

The Coral Reef Restoration Handbook is the first published volume devoted to the science of coral reef restoration. It offers a scientific, conceptual framework along with practical strategies for reef assessment and restoration. Contributors from a variety of disciplines discuss engineering, geological, biological, and socioeconomic factors to create a text that is designed to guide scientists and resource managers in the decision-making process from initial assessment of the injury through conceptual restoration design, implementation, and monitoring. An excellent selection of relevant case studies is utilized to illustrate concepts and challenges inherent in the process of restoration.

Practitioners, implementing agencies

Precht, W.F. (2006) Coral Reef Restoration Handbook. CRC Press.

http://www.crcpress.com/product/isbn/9780849320736;jsessionid=E-Soh1lfSPtMdfDM2nbXTA

Coastal/Marine>Coral Reefs>Australia

Accelerated Regeneration of Hard Corals: A Manual for Coral Reef Users and Managers

The following report is intended as a manual for those contemplating the regeneration of an area of reef for either management or financial reasons. It is not written as a scientific paper and experimental results upon which the manual is based are confined to technical appendices. Techniques were developed and evaluated at Green Island Reef which had been affected several years earlier by the crown-of-thorns starfish. A project monitoring the natural regeneration at Green Island was undertaken concurrently and is reported separately, though the results contained therein are referred to where relevant.

Practitioners, implementing agencies

Harriott, V.J. and D.A. Fisk (1987) Accelerated Regeneration of Hard Corals: A Manual for Coral Reef Users and Managers. Great Barrier Reef Marine Park Authority Technical Memorandum GBRMPA-TM-16.

http://www.gbrmpa.gov.au/__data/assets/pdf_file/0009/9756/gbrmpa-tm16.pdf

Coastal/Marine>Coral Reefs>Caribbean/USA

Caribbean Acropora Restoration Guide: Best Practices for Propagation and Population Enhancement

The purpose of this guide is to share the collective knowledge of a community of scientists and restoration practitioners who have been working both independently and collaboratively to restore populations of Acropora corals throughout the Caribbean. By sharing lessons learned from years of experience of in situ Acropora propagation and coral population enhancement in Florida and the Caribbean, we want to increase the success of others' efforts and accelerate conservation and restoration at a regional scale. This guide provides best current practices for nursery and outplanting design and methodology. We use case studies to illustrate how these practices have been implemented in various projects throughout the Caribbean.

Practitioners

Johnson, M. E., C. Lustic, E. Bartels, I. B. Baums, D. S. Gilliam, L. Larson, D. Lirman, M. W. Miller, K. Nedimyer and S. Schopmeyer (2011) Caribbean Acropora Restoration Guide: Best Practices for Propagation and Population Enhancement. The Nature Conservancy, Arlington, VA.

http://frrp.org/FRRP%20documents/Coral_Guide_111811_r1.pdf

Coastal/Marine>Coral Reefs>Japan

Manual for Restoration and Remediation of Coral Reefs

This manual collects the methods, achievements, and problems of measures including 1) seeding production and settlement induction by utilizing the coral sexual reproduction, 2) transplantation of coral fragments by utilizing asexual reproduction, 3) transplantation of colonies or entire reef, and 4) management of settled seeding, transplanted colonies and coral communities.

Practitioners

Omori, M. and S. Fujiwara (eds.) (2004) Manual for Restoration and Remediation of Coral Reefs. Nature Conservation Bureau and Ministry of the Environment, Japan.

http://www.coremoc.go.jp/report/RSTR/RSTR2004a.pdf

Coastal/Marine>Dunes>Mexico

Manual para la Reforestación de los Medanos

El objetivo de este manual es presentar información práctica, basada en las experiencias desarrolladas como parte del proyecto CONAFOR-CONACYTINECOL No.14766. Presenta

información sobre la germinación, crecimiento, establecimiento de una plantación arbórea y seguimiento de la misma en un sistema de dunas o médanos. Además, la información se amplia con una revisión bibliográfica que permite proporcionar datos y sugerencias sobre un mayor conjunto de especies, todas ellas habitantes importantes de las selvas de los médanos.

Practitioners

Moreno-Casasola, P., D.M. Infante, A.C. Travieso-Bello and C. Madero (2009) Manual para la reforestación de los médanos. Instituto de Ecología A.C., CONAFOR y CONACYT. Xalapa Ver., México.

http://www1.inecol.edu.mx/inecol/libros/Manual_para_la_reforestacion_de_los_medanos1.pdf

Coastal/Marine>Dunes>Spain

Manual de Restauración de Dunas Costeras

El objetivo de este Manual es dotar de la información que permita proponer las medidas técnicas necesarias para conseguir una restauración ecológica de las dunas costeras, mediante un proceso que facilite la recuperación del ecosistema degradado, dañado o destruido, cuya meta sea recuperar sus valores intrínsecos, elementos bióticos, abióticos y su funcionamiento y dinámica, en su contexto histórico y regional, y que permita la realización de prácticas culturales sostenibles. El Manual va dirigido, por tanto, a los técnicos y gestores que dedican su actividad a la gestión y restauración de los sistemas dunares.

Practitioners

El Ministerio de Agricultura, Alimentación y Medio Ambiente (2009) Manual de restauración de dunas costeras. Gobierno de Espana

http://www.magrama.gob.es/es/costas/publicaciones/manual_restauracion_dunas.aspx

Coastal/Marine>Estuaries>Europe

EC Guidance on the Implementation of the EU Nature Legislation in Estuaries and Coastal Zones

This guidance provides sector specific guidance on the implementation of the Birds and Habitats Directives in estuaries and coastal zones, and also helps citizens and stakeholders in better understanding key provisions of the Directives.

Policymakers

European Commission (2011)

http://ec.europa.eu/transport/maritime/doc/guidance_doc.pdf

Coastal/Marine>Estuaries>USA

Returning the Tide: Tidal Hydrology Restoration Guidance Manual for the Southeastern US

The goal of this manual is to increase and improve habitat restoration in estuarine environments impacted by the creation of barriers to tidal hydrology. It offers guidance to restoration practitioners and coastal resource managers who may not have familiarity with tidal hydrology restoration techniques. Specifically, this manual will help users: 1) Identify restoration projects and partners; 2) Develop appropriate objectives and quality project design; 3) Define and implement construction and maintenance strategies; 4) Navigate and optimize the permitting process; 5) Determine the meaning of "hydrology restoration success"; and 6) Build community support for projects and address typical community concerns. The Toolkit section is a resource for restoration project planning and implementation. It is designed to be easy-to-use by providing checklists, agency contact information, example project documents, and bulleted to-do lists for every stage of project implementation. The Project Portfolios provide details on 13 real-world projects including background, results, and lessons learned.

Practitioners, implementing agencies

NOAA Restoration Center & NOAA Coastal Services Center (2010) Returning the Tide: A Tidal Hydrology Restoration Guidance Manual for the Southeastern U.S. NOAA, Silver Spring, MD.

http://www.habitat.noaa.gov/toolkits/tidal_hydro.html

Guiding Restoration Principles: Puget Sound Nearshore Partnership

These principles are considered critical to the success of diverse restoration and protection actions. They communicate PSNP's understanding of nearshore ecosystems and provide a framework for identifying, evaluating, and implementing restoration and protection actions; they apply to project stages from early planning to post-implementation monitoring. Developed to inform PSNP, it is anticipated that these principles will also be useful to the diverse array of people and organizations involved in restoration and protection of nearshore ecosystems and habitats.

Implementing agencies, practitioners, indigenous and local communities

Goetz, F., C. Tanner, C.S. Simenstad, K. Fresh, T. Mumford and M. Logsdon (2004) Guiding restoration principles. Puget Sound Nearshore Partnership Report No. 2004-03. Washington Sea Grant Program, University of Washington, Seattle.

http://www.pugetsoundnearshore.org/technical_papers/nearshore_guiding_principles.pdf

Guidance for Protection and Restoration of the Nearshore Ecosystems of Puget Sound

Fresh, K., C. Simenstad, J. Brennan, M. Dethier, G. Gelfenbaum, F. Goetz, M. Logsdon, D. Myers, T. Mumford, J. Newton, H. Shipman and C. Tanner (2004) Guidance for protection and restoration of the nearshore ecosystems of Puget Sound. Puget Sound Nearshore Partnership Report No. 2004-02. Published by Washington Sea Grant Program, University of Washington, Seattle.

http://www.pugetsoundnearshore.org/technical_papers/guidance.pdf

Application of "Best Available Science" in Ecosystem Restoration: Lessons Learned from Large-scale Restoration Efforts in the USA

Van Cleve, F.B., C. Simenstad, F. Goetz and T. Mumford (2004) Application of "best available science" in ecosystem restoration: lessons learned from large-scale restoration efforts in the USA. Puget Sound Nearshore Partnership Report No. 2004-01. Published by Washington Sea Grant Program, University of Washington, Seattle.

http://www.pugetsoundnearshore.org/technical_papers/lessonslearned.pdf

Conceptual Model for Assessing Restoration of Puget Sound Nearshore Ecosystems

Simenstad, C., M. Logsdon, K. Fresh, H. Shipman, M. Dethier and J. Newton (2006) Conceptual model for assessing restoration of Puget Sound nearshore ecosystems. Puget Sound Nearshore Partnership Report No. 2006-03. Published by Washington Sea Grant Program, University of Washington, Seattle.

http://www.pugetsoundnearshore.org/technical_papers/conceptual_model.pdf

Management Measures for Protecting and Restoring the Puget Sound Nearshore

Clancey, M. et al (2009) Management Measures for Protecting and Restoring the Puget Sound Nearshore. Technical Report 2009-01. Prepared in support of the Puget Sound Nearshore Ecosystem Restoration Project.

http://www.pugetsoundnearshore.org/technical_papers/mangement_measure.pdf

Principles for Strategic Conservation and Restoration

Greiner, C.M. (2010) Principles for Strategic Conservation and Restoration. Technical Report 2010-01. Prepared in support of the Puget Sound Nearshore Ecosystem Restoration Project.

http://www.pugetsoundnearshore.org/technical_papers/conservation_and_restoration_principles.pdf

Strategies for Nearshore Protection and Restoration in Puget Sound

Cereghino, P., J. Toft, C. Simenstad, E. Iverson, S. Campbell, C. Behrens and J. Burke (2012) Strategies for nearshore protection and restoration in Puget Sound. Puget Sound Nearshore Report No. 2012-01. Published by Washington Department of Fish and Wildlife, Olympia, Washington, and the U.S. Army Corps of Engineers, Seattle.

http://www.pugetsoundnearshore.org/technical_papers/PSNERP_Strategies_NoMaps.pdf

Design Guidelines for Tidal Wetland Restoration in the San Francisco Bay

These guidelines were produced for all individuals who have some degree of responsibility for decisions made on tidal wetland restoration design, including regulatory agency staff, land managers, resource managers and restoration practitioners.

Implementing agencies, practitioners

Philip Williams & Associates, Ltd. (2004) Design Guidelines for Tidal Wetland Restoration in the San Francisco Bay. The Bay Institute and the California State Coastal Conservancy.

http://www.wrmp.org/design/Guidelines_Report-Final.pdf

Restoration Science Strategy: A Framework

This strategy describes the current and potential role of the US National Estuarine Research Reserve System (NERRS) in restoration science and provides a framework for how the reserve system can contribute more fully to the successful restoration of estuaries through science and education.

Policymakers

US National Estuarine Research Reserve System

http://nerrs.noaa.gov/Doc/PDF/Stewardship/NERRSRSSFramewk.pdf

Coastal/Marine>Mangroves

Five Steps to the Successful Ecological Restoration of Mangroves

Restoration and rehabilitation of existing or former mangrove forest areas is extremely important today. In fact, given the importance of mangrove forest ecosystems, and the current threat to these coastal forests, this is an imperative. But actual planting of mangroves is rarely needed as mangroves annually produce hundreds or thousands of seeds or seedlings per tree, which under the proper hydrologic conditions can recolonize former mangrove areas (returned to normal hydrology) very rapidly. There are many different techniques and methods utilized in restoring mangroves. Because some of these have resulted in identifiable successes or failures, we wish to present herein a summary description of several preferred methods for planning and implementing mangrove rehabilitation.

Practitioners, implementing agencies, indigenous and local communities

English, Bahasa Indonesian

Mangrove Action Project (2006) Five Steps to the Successful Ecological Restoration of Mangroves. Yayasan Akar Rumput Laut, Yogyakarta.

http://mangroveactionproject.org/map-programs/restoration/steps-to-successful-ecological-restoration

Draft Code of Conduct for the Sustainable Management of Mangrove Ecosystems

Formulation of the Code of Conduct is based on existing knowledge, experience and concepts. The Code identifies key linkages and co-ordination needs among government departments, NGOs, nearby communities and entrepreneurs who have an interest in the conservation of mangrove ecosystems and sustainable use of mangrove resources. It recommends key legislation and enforcement mechanisms (e.g., governmental and/or community-based) required for the effective conservation, protection and sustainable use of mangroves.

Policymakers, implementing agencies

World Bank, ISME, cenTER Aarhus (2003) Draft Code of Conduct for the Sustainable Management of Mangrove Ecosystems.

http://www.mangroverestoration.com/MBC_Code_AAA_WB070803_TN.pdf

Coastal/Marine>Mangroves>Asia-Pacific

Manual on Guidelines for Rehabilitation of Coastal Forests damaged by Natural Hazards in the Asia-Pacific Region

The manual includes introductory chapters on coastal forests (mangrove forests, beach and dune forests, and forests of coral islands), natural hazards (tsunamis, tropical cyclones, coastal

erosion and sea-level rise), and the protective roles of coastal forests. The main chapter provides an overview (concepts and rationale of rehabilitation, and rehabilitation efforts), and guidelines for rehabilitation of mangroves and other coastal forests. The guidelines include the rationale for rehabilitation; choice of species; site selection and preparation; propagation and planting; monitoring and tending; and case studies. The case studies provide useful lessons of success and failure of past and on-going projects in coastal forest rehabilitation.

Implementing agencies, practitioners, indigenous and local communities

Chan, H.T. and S. Baba (2009) Manual on Guidelines for Rehabilitation of Coastal Forests damaged by Natural Hazards in the Asia-Pacific Region. International Society for Mangrove Ecosystems (ISME) and International Tropical Timber Organization (ITTO).

http://www.pacificdisaster.net/pdnadmin/data/original/ISME_2009_Manual_coastalforest_rehabilita.pdf

Best Practice Guidelines on Restoration of Mangroves in Tsunami Affected Areas

These guidelines provide the reader with appropriate knowledge and understanding over the following aspects of mangrove silviculture (planting) for coastal protection.

Practitioners, indigenous and local communities

Wetlands International

http://www.wetlands.org/LinkClick.aspx?fileticket=EaD3s%2Bil5Mw%3D&tabid=56

Coastal/Marine>Mangroves>India

Mangrove Forest Restoration in Andhra Pradesh, India

This document reflects the process and results of restoration activities carried out over seven years by the project Coastal Wetlands: Mangrove Conservation and Management and is meant for foresters, field technicians, researchers and others interested in restoration of degraded mangroves.

Practitioners, implementing agencies, indigenous and local communities

Ramasubramanian, R. and T. Ravishankar (2004) Mangrove Forest Restoration in Andhra Pradesh, India. M. S. Swaminathan Research Foundation MSSRF/MA/04/13.

http://www.globalrestorationnetwork.org/uploads/files/CaseStudyAttachments/60_andhra-pradesh.pdf

Coastal/Marine>Mangroves>Philippines

Mangrove Management Handbook

This Mangrove Management Handbook is comprised of six chapters packed full of useful information on how to protect and manage mangroves as a natural and productive resource. It is intended to help people anywhere who wish to become stewards of mangrove forest resources. People's organizations, nongovernment organizations and local government are the primary audience but of course others can benefit from the information presented in this volume.

Implementing agencies, indigenous and local communities

Melana, D.M., J. Atchue III, C.E. Yao, R. Edwards, E.E. Melana and H.I. Gonzales (2000) Mangrove Management Handbook. Department of Environment and Natural Resources, Manila, Philippines through the Coastal Resource Management Project, Cebu City.

http://info.frim.gov.my/cfdocs/tsonami2/Mangrove%20Mgt%20HBook%20-%20Melana%202000.pdf

Coastal/Marine>Mangroves>Sri Lanka

Mangrove Rehabilitation Guidebook

Two larger mangrove nurseries and ten household nurseries have already been established in the framework of this project in the wetland areas Maduganga and Madampe. Sufficient number of plants have been grown in order to restore a total of ten hectares of mangroves in the two wetlands. Approximately 2,200 plants are needed per hectare. The Nagenahiru Foundation carries out workshops for women managing household nurseries. One of the larger mangrove nurseries situated in Pathamulla is used as a mangrove demonstration and education site.

Policymakers, implementing agencies, indigenous and local communities

Global Nature Fund (2007)

http://www.globalnature.org/bausteine.net/file/showfile.aspx?downdaid=6426&domid=1011&fd=2

Coastal/Marine>Mangroves>Vietnam

Mangrove Restoration in Vietnam: Key Considerations and a Practical Guide

The aim of this report is to provide in a nutshell the key considerations for successful mangrove rehabilitation or planting project. It can be used as a practical guide to the planning of these projects, although it must be stressed that using this guide alone does not guarantee success. Equally important is to involve an appropriate mix of experts, both from the ecological and socioeconomic, engineering and juridical domains.

Implementing agencies, practitioners, indigenous and local communities

Marchand, M. (2008) Mangrove Restoration in Vietnam: Key Considerations and a Practical Guide. Prepared for WRU/TUD.

http://repository.tudelft.nl/view/ir/uuid%3A98b5ba43-1452-4631-81dc-ad043ef3992c/

Coastal/Marine>Salt Marshes

Tidal Marsh Restoration: A Synthesis of Science and Management

Tidal Marsh Restoration provides the scientific foundation and practical guidance necessary for coastal zone stewards to initiate salt marsh tidal restoration programs. The book compiles, synthesizes, and interprets the current state of knowledge on the science and practice of salt marsh restoration, bringing together leaders across a range of disciplines in the sciences (hydrology, soils, vegetation, zoology), engineering (hydraulics, modeling), and public policy, with coastal managers who offer an abundance of practical insight and guidance on the development of programs. Tidal Marsh Restoration is an essential work for managers, planners, regulators, environmental and engineering consultants, and others engaged in planning, designing, and implementing projects or programs aimed at restoring tidal flow to tide-restricted or diked salt marshes.

Practitioners, implementing agencies

Roman, C.T. and D.M. Burdick (eds.) (2012) Tidal Marsh Restoration: A Synthesis of Science and Management. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/T/bo8032098.html

Saltmarsh Conservation, Management and Restoration

This book deals mainly with the saltmarshes of temperate parts of the northern hemisphere. It provides an introductory framework to the problems of saltmarsh conservation, management and restoration. It gives the reader background information on the issues and pointers to their possible solutions. Descriptions of the trends and trade-offs help to identify different policy options.

Policymakers, implementing agencies

Doody, J.P. (2008) Saltmarsh Conservation, Management and Restoration. Springer, New York..

http://www.springer.com/environment/paleoenvironmental+sciences/book/978-1-4020-4603-2

Coastal/Marine>Salt Marshes>Australia

Saltwater Wetlands Rehabilitation Manual

The aim of this Saltwater Wetlands Rehabilitation Manual is to provide technical information and guidance to assist with the rehabilitation of degraded saltwater wetlands, that is, restoration to a functional condition. Saltwater wetlands have complex hydraulic, physical, chemical, biological and ecological interactions which are quite different from those of freshwater wetlands and which need to be understood and addressed before rehabilitation is undertaken. Furthermore, there are significantly different issues for excavation and construction works in saltwater wetlands, due to the physical (low strength, saturated conditions) and chemical (potentially low pH, highly saline and high organic content) nature of soils in these areas.

Practitioners, implementing agencies

Department of Environment and Climate Change NSW (2008) Saltwater Wetlands Rehabilitation Manual. State of NSW and Department of Environment and Climate Change NSW, Australia.

http://www.environment.nsw.gov.au/resources/water/08555saltwetbk.pdf

Coastal/Marine>Salt Marshes>UK

Saltmarsh Management Manual

The Saltmarsh Management Manual describes what it is that needs to be managed and aims to help develop an understanding of how to evaluate the need for management intervention and the form that intervention might take. The Manual includes details of a number of techniques that can be applied for maintaining, restoring, enhancing or creating saltmarsh. The focus of the Manual is on managing existing saltmarsh environments. Although creation is not strictly related to the management of ‘existing’ saltmarsh, it is also considered because it represents an important option for the future management of the coast/estuaries and a lot of information pertinent to the creation of a new habitat can apply to the restoration or enhancement of an existing resource that is declining.

Implementing agencies, practitioners

Adnitt, C. et al (2007) Saltmarsh Management Manual. Joint Defra/Environment Agency Flood and Coastal Erosion Risk Management R&D Programme, Technical Report SC030220, UK.

http://publications.environment-agency.gov.uk/PDF/SCHO0307BMKH-E-E.pdf

Coastal/Marine>Salt Marshes>USA

Handbook for Restoring Tidal Wetlands

The Handbook for Restoring Tidal Wetlands fills an important gap in current restoration ecology literature. It provides a broad-based compilation of case studies and principles to guide the management of tidal restoration sites. Thoroughly illustrated with more than 170 figures and tables, the book covers a full range of topics including: 1) the conceptual planning for coastal wetlands restoration, 2) strategies for the manipulation of hydrology and soils, 3) the reestablishment of vegetation and assemblages of fishes and invertebrates, and 4) the process of assessing, monitoring, and sustaining restored wetlands.

Practitioners, implementing agencies

Zedler, J.B. (2000) Handbook for Restoring Tidal Wetlands. CRC Press.

http://www.crcpress.com/product/isbn/9780849390630

New York State Salt Marsh Restoration and Monitoring Guidelines

This document is primarily intended to guide voluntary restoration projects, not mitigation projects. Mitigation projects are constrained by specific regulatory standards. This document does not modify or waive any program standards for mitigation. In addition, while voluntary projects are more flexible in goal setting and design, such projects will nevertheless be subject to regulatory requirements, including permits and approvals from the State and federal government. The Salt Marsh Restoration and Monitoring Guidelines are primarily intended for use with projects sponsored by municipalities. Individuals with ideas for restoration projects are strongly encouraged to collaborate with their municipality, and to contact regional Department of Environmental Conservation staff prior to project planning.

Implementing agencies

Niedowski, N.L. (2000) New York State Salt Marsh Restoration and Monitoring Guidelines. New York State Department of State, Division of Coastal Resources and New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources Bureau of Marine Resources.

http://faculty.umb.edu/anamarija.frankic/eeos476/Class%20Materials/NY%20State%20Salt%20Marsh%20Restoration%20and%20Monitoring%20Guidelines.pdf

Shore Erosion Control Guidelines: Marsh Creation

The ability of wetlands to control erosion is so valuable that artificial wetlands are being constructed along coastal areas to buffer the storm surges from hurricanes and tropical storms. Wetlands at the margins of lakes, rivers, bays, and the ocean protect shorelines and stream banks against erosion. Wetland plants hold the soil in place with their roots, absorb the energy of waves, and slow the flow of stream or river currents along the shore. Utilizing wetlands in erosion control can therefore achieve homeowner's goals by maintaining the integrity of the shoreline and can simultaneously enhance the Bay ecosystem.

Practitioners, implementing agencies, indigenous and local communities

Maryland Department of the Environment Wetlands and Waterways Program (2006)

http://ccrm.vims.edu/livingshorelines/documents/Promotional/shore_erosion_bosch.pdf

Coastal/Marine>Seagrass Meadows

Restoration of Seagrass Meadows

This document describes recent techniques for seagrass restoration that may be divided into two basic groups: 1) activities focused on collecting and transplanting plants, and 2) activities focused on obtaining and planting seeds.

Practitioners

Oceania Sustainable Development Manuals

http://www.pradariasmarinhas.com/restoration_manual.pdf

Coastal/Marine>Seagrass Meadows>USA

Guidelines for the Conservation and Restoration of Seagrasses in the United States and Adjacent Waters

These guidelines discuss important issues that should be addressed in planning seagrass restoration projects, describes different planting methodologies, and proposes monitoring criteria and means for evaluating success.

Practitioners

Fonseca, M.S. et al. (1998) Guidelines for the Conservation and Restoration of Seagrasses in the United States and Adjacent Waters. NOAA Coastal Ocean Program Decision Analysis Series No. 12. NOAA Coastal Ocean Office, Silver Spring, MD.

http://www.seagrassrestorationnow.com/docs/Fonseca%20et%20al%201998.pdf

Technical Guidelines for the Delineation, Restoration, and Monitoring of Eelgrass (Zostera marina) in Massachusetts Coastal Waters

This technical report presents Marine Fisheries' recommended methods to delineate eelgrass at a project site, conduct a restoration/mitigation effort by transplanting eelgrass into a carefully selected location, and monitor the restored habitat to ensure that it has met success criteria. Eelgrass surveys should be conducted before the project design is finalized. Surveys should include an assessment of available resource maps, followed by a field survey to more accurately define the perimeter of the existing meadow.

Practitioners, implementing agencies

Evans, N.T. and A.S. Leschen (2010) Technical guidelines for the delineation, restoration, and monitoring of eelgrass (Zostera marina) in Massachusetts coastal waters. Marine Fisheries Technical Report 43.

http://www.mass.gov/dfwele/dmf/publications/tr_43.pdf

Coastal/Marine>Shellfish Beds

A Practitioner's Guide to the Design & Monitoring of Shellfish Restoration Projects

This guide was written to help restoration practitioners design and monitor shellfish restoration projects that restore not only the populations of target shellfish species – primarily clams, oysters, scallops – but also the 'ecosystem services' associated with healthy populations of these organisms.

Practitioners

The Nature Conservancy

http://www.habitat.noaa.gov/pdf/tncnoaa_shellfish_hotlinks_final.pdf

Practitioner's Guide to Shellfish-Based Living Shorelines for Salt March Erosion Control and Environmental Enhancement in the Mid-Atlantic

The first objective of this report is to summarize climate adaptation tactics that are environmentally friendly approaches to help stabilize seaward edge erosion, thereby

encouraging vertical accretion of tidal marshes. The second objective of this report is to provide a "how-to guide" for a new living shoreline approach developed jointly by PDE and Rutgers and which is tailored to salt marshes of the Delaware Estuary. This tactic is best suited for low energy areas and would need to be paired with more aggressive measures along high energy coastlines.

Practitioners, implementing agencies

Whalen, L., D. Kreeger, D. Bushek, J. Moody and A. Padeletti (2011) Practitioner's Guide to Shellfish-Based Living Shorelines for Salt March Erosion Control and Environmental Enhancement in the Mid-Atlantic. Partnership for the Delaware Estuary and Rutgers Haskin Shellfish Laboratory.

http://www.delawareestuary.org/pdf/Living%20Shorelines/DELSI%20Practitioners%20Guide%20v9.7.11.pdf

Best Management Practices for Shellfish Restoration

The objectives of the Best Practices for Shellfish Restoration (BMPs) project are to establish methods which include protocols for educational programs and safeguards to ensure that shellfish grown in unapproved areas do not reach the market. The project was recommended by the Shellfish Restoration Committee of the Interstate Shellfish Sanitation Conference (ISSC) at their biennial meeting in 2009. The Nature Conservancy (TNC), through a National Partnership with the NOAA Restoration Center, is working with ISSC on this project to guide future shellfish restoration projects that incorporate educational components designed to protect public health.

Implementing agencies, indigenous and local communities

Dorothy Leonard and Sandra Macfarlane (2011) Best Management Practices for Shellfish Restoration. ISSC Shellfish Restoration Committee

http://www.oyster-restoration.org/reports/ISSC%20BMPs%20for%20Shellfish%20Restoration%20Report%20with%20Appendices.pdf?PHPSESSID=b931619deea5fce75d8932fc7e5809d2

Drylands

Generic Guidelines for Mainstreaming Drylands Issues into National Development Frameworks

This document provides broad generic steps for mainstreaming environment and drylands issues into national development frameworks, as well lessons drawn from various countries on environment and drylands mainstreaming. The steps arise from experiences in sample countries in Africa, Latin America and the Caribbean, including Argentina, Bangladesh, Barbados, Benin, Bolivia, Burkina Faso, China, Ethiopia, Ghana, India, Kenya, Mali, Morocco, Mozambique, Namibia, Niger, Rwanda, Samoa, Tanzania, Tunisia and Uganda. These national case studies documented the countries' lessons, processes, challenges and experiences in mainstreaming.

Policymakers

English, French, Spanish

UNDP (2008) Generic Guidelines for Mainstreaming Drylands Issues into National Development Frameworks. UNDP.

http://www.undp.org/drylands/mainstreaming.html

Drylands>South Africa

Eleven Steps to Rehabilitation in the Succulent Karoo and Namib Desert

This booklet provides simple guidelines for all stakeholders. It is our wish that the industrial and environmental sectors work closely together, in mutually supportive partnerships, to implement these guidelines. In so doing, they will contribute significantly to maintaining the unique and fragile environments of the Succulent Karoo and Namib Desert, and thereby help to ensure that other sectors and future generations of Namibians can benefit from them.

Policymakers, implementing agencies

Burke, A. (2007) Eleven steps to rehabilitation in the Succulent Karoo and Namib Desert. EnviroScience and Namibia Nature Foundation. Oranjemund and Windhoek.

http://www.nnf.org.na/NNF_pages/publications.htm

Drylands>Sub-Saharan Africa

Sustainable Land Management in Practice: Guidelines and Best Practices for Sub-Saharan Africa

The document highlights the main principles of Sustainable Land Management (SLM), identifies and analyses best practices for improved productivity, livelihoods and ecosystem services and

offers a framework for investment in SLM on the ground. It is illustrated with 47 case studies from 18 countries.

Implementing agencies, practitioners

English, French

Liniger, H.P., R. Mekdaschi Studer, C. Hauert and M. Gurtner (2011) Sustainable Land Management in Practice – Guidelines and Best Practices for Sub-Saharan Africa. TerrAfrica, World Overview of Conservation Approaches and Technologies (WOCAT) and Food and Agriculture Organization of the United Nations (FAO).

https://www.wocat.net/en/knowledge-base/documentation-analysis/global-regional-books.html

Drylands>USA/Mexico

Guide for Desert and Dryland Restoration: New Hope for Arid Lands

This book provides an introduction to the critically important challenge of desert and dryland restoration. It provides a brief introduction to the ecology of desert plants in southwestern North America, explores the causes of desertification and land abuse, and outlines the processes and procedures needed to evaluate sites and plan, implement, and monitor desert restoration projects. It should also prove useful to many people and groups involved in reserve or park management, farming, forestry, ranching, landscaping, gardening, and recreational development.

Implementing agencies, practitioners

Bainbridge, D.A. (2007) A Guide for Desert and Dryland Restoration: New Hope for Arid Lands. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/G/bo3753008.html

A Beginner's Guide to Desert Restoration (1995)

http://www.nps.gov/plants/restore/pubs/BeginnerGuidetoDesertRestoration.pdf

Drylands>Mediterranean

Restauración de Ecosistemas Mediterráneos

El libro Restauración de Ecosistemas Mediterráneos recoge las ponencias que se presentaron en el Simposio de la Asociación Española de Ecología Terrestre Restauración de Ecosistemas

Mediterráneos. Posibilidades y limitaciones, celebrado en Alcalá de Henares del 20 al 21 de Septiembre de 2001, además de algunas comunicaciones seleccionadas. El principal objetivo de esta publicación es poner a disposición de los estudiantes universitarios, de licenciatura y escuelas técnicas, pre y postdoctorales, así como de técnicos que desarrollen su profesión en empresas y administraciones, un volumen en castellano que proporcione una visión amplia, actualizada e integrada sobre la Restauración ecológica en nuestros ambientes mediterráneos

Practitioners

Rey-Benayas, J. M. et al. (eds) (2003) Restauración de ecosistemas mediterráneos. Universidad de Alcalá, Madrid.

http://www.casadellibro.com/libro-restauracion-de-ecosistemas-mediterraneos-contiene-cd/9788481387537/1179721

Guidelines for Erosion and Desertification Control Management with Particular Reference to Mediterranean Coastal Areas

The objectives of the present guidelines are related to mitigation of erosion and desertification processes in the region and preparation of a practical document to be used as tool when formulating and planning relevant control management programmes and projects. The guidelines are intended for experts and professionals involved in the control management process, experts in relevant sectoral activities, and decision makers responsible for mitigation and control of erosion and desertification phenomena and processes.

Policymakers, implementing agencies

UNEP/MAP/PAP (2000) Guidelines for erosion and desertification control management with particular reference to Mediterranean coastal areas. United Nations Environment Programme, Mediterranean Action Plan, Priority Actions Programme.

http://www.pap-thecoastcentre.org/pdfs/SoilErosion.pdf

Forests/Woodlands

Rehabilitation and Restoration of Degraded Forests

The authors present approaches to restoring and rehabilitating the vast areas of degraded, fragmented and modified forests which cover much of the world. They argue that by applying best practice at the site level it is possible to enhance socio-economic and ecological gains at the landscape level. This approach is consistent with the ecosystem approach called for in the Convention on Biological Diversity.

Policymakers, implementing agencies

Lamb, D. and D. Gilmour (2003) Rehabilitation and Restoration of Degraded Forests. IUCN, Gland, Switzerland and Cambridge, UK and WWF, Gland, Switzerland.

http://data.iucn.org/dbtw-wpd/edocs/FR-IS-005.pdf

Forests/Woodlands>Boreal

Restoration of Boreal and Temperate Forests

This reference presents the best practices for fostering increased sustainability, enhancing biodiversity, and repairing ecosystem functions in one comprehensive volume. It summarizes the breadth of restoration protocols at both the local and regional scale and documents and compares over 20 case studies of forest restoration projects in a geographically diverse range of temperate and boreal zones. The authors take into account the impact of human activities from a historical and cultural context and consider regional socioeconomic needs in developing a sustainable forest management plan. The book provides insight into how logistical questions are currently being answered for temperate and boreal forests. By addressing both ecological and sociopolitical needs, this book presents practical solutions for the restoration, rehabilitation, reclamation, and management of forest ecosystems.

Implementing agencies, practitioners

Stanturf, J.A. and P. Madsen (eds.) (2004) Restoration of Boreal and Temperate Forests. CRC Press.

http://www.crcpress.com/product/isbn/1566706351

Forests/Woodlands>Boreal>Finland

Principles of Ecological Restoration of Boreal Forested Ecosystems: Finland as an Example

The purpose of this paper is to outline general principles and approaches for restoration of boreal forest and peatland ecosystems. Detailed practical methods of restoration of specific forest and peatland types are not presented. The paper is largely based on experiences in Finland.

Kuuluvainen, T. et al. (2002) Principles of Ecological Restoration of Boreal Forested Ecosystems: Finland as an Example. Silva Fennica 36(1).

http://metla.eu/silvafennica/full/sf36/sf361409.pdf

Forests/Woodlands>Mediterranean

Guidelines for Restoration of *Pinus nigra* Forests Affected by Fires through a Structured Approach

The guidelines for describe a five steps approach. The approach proposes the use of a mix of criteria selection and ranking of the burnt areas, the nature of which are summarised as follows: i) Exclusion criteria, such as natural regeneration potential including criteria with threshold values; ii) Criteria (biotic, abiotic and technical) that lead to a hierarchical rating of areas to be restored. Additionally in the guidelines has been included an approach for the planning of the post-fire emergency actions as long a group of actions that increase the readiness of the Forest Service for the planning and implementation of emergency and long term restoration measures

Implementing agencies, practitioners

Kakouros, P. and S. Dafis (2010) Guidelines for restoration of Pinus nigra forests affected by fires through a structured approach. Version 2. Greek Biotope Wetland Centre. Thermi.

http://www.parnonaslife.gr/txt/Guidelines_Structured_approach_v2finalENG.pdf

Forests/Woodlands>Temperate

Restoration of Boreal and Temperate Forests

This reference presents the best practices for fostering increased sustainability, enhancing biodiversity, and repairing ecosystem functions in one comprehensive volume. It summarizes the breadth of restoration protocols at both the local and regional scale and documents and compares over 20 case studies of forest restoration projects in a geographically diverse range of temperate and boreal zones. The authors take into account the impact of human activities from a historical and cultural context and consider regional socioeconomic needs in developing a sustainable forest management plan. The book provides insight into how logistical questions are currently being answered for temperate and boreal forests. By addressing both ecological and sociopolitical needs, this book presents practical solutions for the restoration, rehabilitation, reclamation, and management of forest ecosystems.

Implementing agencies, practitioners

Stanturf, J.A. and P. Madsen (eds.) (2004) Restoration of Boreal and Temperate Forests. CRC Press.

http://www.crcpress.com/product/isbn/1566706351

Forests/Woodlands>Temperate>Australia

Temperate Woodland Conservation and Management

This book summarises the main discoveries, management insights and policy initiatives in the science, management and policy arenas associated with temperate woodlands in Australia. It features new perspectives on the integration of woodland management and agricultural production, including the latest thinking about whole of paddock restoration and carbon farming, as well as financial and social incentive schemes to promote woodland conservation and management. Temperate Woodland Conservation and Management will be a key supporting aid for farmers, natural resource managers, policy makers, and people involved in NGO landscape restoration and management.

Lindenmayer, D., A. Bennett and R. Hobbs (eds.) (2010) Temperate Woodland Conservation and Management, CSIRO Publishing, Collingwood.

http://www.publish.csiro.au/pid/6440.htm

Forests/Woodlands>Temperate>Canada

Restoring British Columbia's Garry Oak Ecosystems: Principles and Practices

The purpose of this book is to provide the best available information about approaches, strategies, and methods for restoration. To achieve this purpose, this guide summarizes the principles and concepts of restoration, reviews the ecology of Garry Oak and associated ecosystems, and provides a wealth of practical information on restoration techniques.

Implementing agencies, practitioners

Clements, D., T.D. Hooper, K. Martell and C. Masson (eds.) (2011) Restoring British Columbia's Garry Oak Ecosystems: Principles and Practices. Garry Oak Ecosystems Recovery Team (GOERT), BC, Canada.

http://www.goert.ca/documents/restorationbooklet/GOERT-restoration-booklet-all.pdf

Forests/Woodlands>Temperate>Greece

Guidelines for the Rehabilitation of Degraded Oak Forests

These guidelines analytically describe the restoration and rehabilitation methods used in the coppice forests while emphasizing on the natural methods. Since not only scientists in Greece,

but in the whole Mediterranean too deal with the issue of the inversion of the oak forests, the results of such experiments in Greece, Italy and Spain are presented.

Implementing agencies, practitioners

English, Greek

Dafis, S. and P. Kakouros (eds.) (2006) Guidelines for the rehabilitation of degraded oak forests. Greek Biotope/Wetland Centre, Thermi.

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=LIFE03_NAT_GR_000093_AfterLIFEConservationPlan.pdf

Forests/Woodlands>Temperate>USA

Guidelines for Aspen Restoration on the National Forests in Utah

In sum, no guidelines for aspen management can anticipate all situations. The intent here is to promote holistic thinking in management decisions. If we act before understanding either the larger ecological context or agents operating on aspen in specific sites, the probability of irrevocable damage increases. If we are uncertain of management outcomes, pre- and post-decision monitoring is critical. Documentation of restoration failures, as well as successes, is an important component of management.

Policymakers, implementing agencies

Utah Forest Restoration Working Group - Ecology Committee (2010) Guidelines for Aspen Restoration on the National Forests in Utah, Western Aspen Alliance, Utah State University, Logan.

http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=8036&context=aspen_bib

A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria

The Citizens' Call for Ecological Forest Restoration is proposed as a national policy framework to guide sound ecological restoration policy and projects. Through these restoration principles, we seek to articulate a collective vision of ecologically appropriate, scientifically supported forest restoration. Scientifically credible principles and criteria provide a yardstick with which to evaluate proposed forest restoration policies and projects that can be used both on the ground and in policy debates.

Policymakers, implementing agencies

DellaSala, D., A. Martin, R. Spivak, T. Schulke, B. Bird, M. Criley, C. van Daalen, J. Kreilick, R. Brown and G. Aplet (2003) A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria. Ecological Restoration 21(1): 14-23.

http://assets.panda.org/downloads/ecorestoration.pdf

New Mexico Forest Restoration Principles

These principles were collaboratively developed by a team of dedicated professionals representing industry, conservation organizations, land management agencies, and independent scientists. These principles for restoration should be used as guidelines for project development and they represent the "zone of agreement" where controversy, delays, appeals, and litigation are significantly reduced. They may be appropriate for application to specific restoration projects in New Mexico. These principles were developed for use in designing and implementing projects with a primary objective of ecological restoration while promoting economic and social benefits.

Policymakers, implementing agencies

USDA Forest Service

http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5207898.pdf

Guiding Principles for Forest Ecosystem Restoration and Community Protection

The Arizona Forest Health Advisory Council has developed these Guiding Principles to provide an overall framework for planning and implementing forest ecosystem restoration and community protection projects statewide. The Guiding Principles urge us to think big. Arizona's forests and the ecological processes that sustain them span landscapes. Assessing needs, identifying priorities, and charting progress toward community protection and forest ecosystem restoration goals must occur within an appropriately large landscape context. The Council's ultimate hope is that the Guiding Principles will help guide our movement toward sustainable and reciprocal relationships between human communities and forest ecosystems – relationships that sustain the biological, cultural, and economic values that contribute to a healthy democratic society, both now and into the future.

Policymakers, implementing agencies

Arizona Forest Health Advisory Council (2003) Guiding Principles for Forest Ecosystem Restoration and Community Protection

http://azgovernor.gov/FHC/documents/FinalGuidingPrinciples.pdf

Forests/Woodlands>Tropical

ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests

These guidelines provide a powerful introduction to the issues confronting the policy-makers, forest practitioners, extension workers and others who want to restore and manage degraded or secondary forests. They stress that the policy, legal and social conditions in and outside the forest must be analyzed and addressed before restoration, management and rehabilitation activities are decided on. They point out that many people have a stake in the forest and any restoration, management or rehabilitation efforts must be made with their full participation. Land tenure issues must be resolved, and transparent mechanisms for sorting out conflicts over property and access rights must be established. Silvicultural techniques that can be understood and implemented by owners of small areas of forest need to be developed.

Implementing agencies, practitioners, policymakers

English, Spanish, French

International Tropical Timber Organization (2002) ITTO guidelines for the restoration, management and rehabilitation of degraded and secondary tropical forests. ITTO Policy Development Series No 13.

http://www.itto.int/policypapers_guidelines/

National Workshops on ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests

http://cmsdata.iucn.org/downloads/latin_america_flr_summary_report.pdf

Forests/Woodlands>Tropical>Africa

Guide to Forest Restoration and Management in the Sahel based on Case Studies at the National Forests of Guesselbodi and Gorou-Bassounga, Niger

Drawing from seven years of progress of project for Guesselbodi and Gorou-Bassounga National Forests in Niger, the authors were able to produce a detailed manual that can be used to establish restoration and management plans for other forests in the region. Descriptions of activities such as resource inventories, landform evaluations, erosion pattern analysis and vegetative mapping, among many others, are given in detail in order to serve as an instructional guide for planners.

Implementing agencies, practitioners

Ministry of Hydrology and the Environment, Forestry Land Use and Planning Project, Niamy, Niger.

http://www.rmportal.net/library/content/tools/biodiversity-support-program/copy_of_cbnfm/USAID-BDB-cd-2-data/sahel.pdf/view?searchterm=monitoring

Forests/Woodlands>Tropical>Asia-Pacific

Research for Restoring Tropical Forest Ecosystems: A Practical Guide

This is a book for researchers. It is aimed at helping anyone involved in setting up and running a Forest Restoration Research Unit to devise a suitable framework species approach to the restoration of forest ecosystems for biodiversity conservation and/or environmental protection. It is one of the main outputs from another UK Darwin Initiative project entitled "Facilitating Forest Restoration for Biodiversity Recovery in Indochina" (2005-2008), carried out jointly by EMR, Wildlife Landscapes and FORRU-CMU and in collaboration with the International Centre for Research on Agro-forestry, China, the Forest and Wildlife Science Research Institute, Cambodia and the Forestry Research Centre, Laos.

Implementing agencies, practitioners, indigenous and local communities

English, Chinese, Lao, Khmer and Thai

Forest Restoration Research Unit (2008) Research for Restoring Tropical Forest Ecosystems: A Practical Guide. Biology Department, Science Faculty, Chiang Mai University, Thailand.

http://www.forru.org/FORRUEng_Website/Pages/engpublications.htm

How to Plant a Forest: The Principles and Practice of Restoring Tropical Forest

This document shows how the framework species method of forest restoration has been successfully adapted to re-establish natural forest ecosystems in northern Thailand. It presents background information that enables readers to understand the natural mechanisms of forest regeneration, as well as practical techniques to harness and accelerate them. Richly illustrated with easy-to-follow diagrams, this book provides scientifically tested advice on how to select appropriate tree species, how to grow them in nurseries, and how to plant and take care of them in deforested areas.

Implementing agencies, practitioners, indigenous and local communities

English, Chinese, Lao, Khmer, Vietnamese, Bahasa Indonesia

Forest Restoration Research Unit (2005) How to Plant a Forest: The Principles and Practice of Restoring Tropical Forests. Biology Department, Science Faculty, Chiang Mai University, Thailand.

http://www.forru.org/FORRUEng_Website/Pages/engpublications.htm

Forests/Woodlands>Tropical>Latin America

Manual de Reforestación para América Tropical

El manual está dirigido a técnicos o a cualquier organización civil que esté interesada en llevar a cabo acciones de reforestación, por lo que su estructura y diseño llevan de la mano al usuario, además de tener una redacción sencilla en donde se explican con claridad los conceptos técnicos y biológicos más necesarios. Presenta una serie de criterios generales básicos, necesarios en la puesta en práctica de cualquier programa de reforestación que utilice especies nativas, independientemente del tipo de vegetación o ecosistema de que se trate; es decir, se aboca a delinear la forma de manejo para cada especie de acuerdo a sus características biológicas particulares.

Implementing agencies, practitioners

United States Department of Agriculture Forest Service, International Institute of Tropical Forestry (2003) Manual de Reforestación para América Tropical. General Technical Report IITF-GTR-18.

http://www.fs.fed.us/global/iitf/IITF-GTR-18.pdf

Forests/Woodlands>Tropical>Dry

Principles of Natural Regeneration of Tropical Dry Forests for Restoration

Tropical dry forests are the most threatened tropical terrestrial ecosystem. However, few studies have been conducted on the natural regeneration necessary to restore these forests. We reviewed the ecology of regeneration of tropical dry forests as a tool to restore disturbed lands.

Policymakers, implementing agencies, practitioners

Daniel L., M. Vieira and A. Scariot (2006) Principles of Natural Regeneration of Tropical Dry Forests for Restoration. Restoration Ecology 14(1): 11–20.

http://www.globalrestorationnetwork.org/uploads/files/LiteratureAttachments/296_principles-of-natural-regeneration-of-tropical-dry-forests-for-restoration.pdf

Forests/Woodlands>Tropical>Mesic>USA

A Mesic Forest Restoration Guide for Hawaii

With interest in the field of ecological restoration growing in Hawaii, this book is an effort to satisfy the growing need for information on the basic principles, methods, and techniques of managing mesic forests in particular and terrestrial native Hawaiian ecosystems in general. Many of the technical recommendations in this manual stem from five years of mesic forest restoration work at The Nature Conservancy's Honouliuli Preserve on Oahu. Most of the resource management recommendations are gleaned from the published works and personal communications of those who have worked for over twenty years in the field of conservation biology. While specifically geared toward resource managers, field biologists, and private landowners, this book is intended to be used by all those who care for our forests for the benefit of our island communities.

Practitioners, implementing agencies

Sailer, D. (2006) I Hoʻōla I Ka Nahele: To Heal A Forest - A Mesic Forest Restoration Guide for Hawaii.

http://manoa.hawaii.edu/hpicesu/DPW/SAILER_2006/v01-08.pdf

Forests/Woodlands>Tropical>Moist>Australia

Rainforest Restoration Manual for South-Eastern Australia

The manual presents detailed restoration methods in 10 easy-to-follow steps, documenting the research and trials undertaken during rainforest restoration over more than two decades. These experiments and their results will empower readers to uncover answers to many of the problems they could encounter. The manual is supported by a CD that provides important background information, with 32 appendices, a propagation manual for the region's 735 rainforest plants, an illustrated glossary and resources for teachers. Species lists and specific planting guides are provided for the 57 rainforest floristic communities that occur from the coast to the mountains between Durras Mountain in New South Wales and the Otways in Victoria.

Practitioners, implementing agencies

Peel, B. (2010) Rainforest Restoration Manual for South-Eastern Australia. CSIRO Publishing, Victoria.

http://www.publish.csiro.au/pid/5268.htm

Forests/Woodlands>Tropical>Moist>India

Rainforest Restoration: A Guide to Principles and Practice

This guide highlights the principles and practices for rainforest restoration that are applicable to the tropical regions of the Americas, Africa, and Asia. It defines rainforest restoration, when it is necessary, and how to prioritize areas for restoration. The guide elaborates on SER's protocols and guidelines for setting targets and indicators of success as well as the framework species and maximum diversity methods. The guide gives an overview of the rainforest ecosystems of the Western Ghats, India highlighting the practical aspects of restoration such as nursery, site preparation, implementation and monitoring protocols. It includes a number of photographs, with before and after shots, and a glossary of key terms.

Implementing agencies, practitioners, indigenous and local communities

Mudappa, D. and T.R.S. Raman (2010) Rainforest Restoration: A Guide to Principles and Practice. Nature Conservation Foundation, Mysore.

http://moef.nic.in/downloads/public-information/Rainforest_Restoration_NCF_India_Web.pdf

Principles for Rainforest and Grassland Restoration in the Anamalai Hills

The region south of the Palghat gap (a 30 km-wide break in the mountain range), known as the southern Western Ghats, contains some of the highest peaks and vast stretches of climax evergreen forest types. It also contains much of the plant and animal diversity, particularly endemic species (species not found anywhere else in the world). The Anamalai hills region is particularly special as it contains the entire range of evergreen forest types and its representative species of plants and animals.

Implementing agencies, practitioners, indigenous and local communities

English, Tamil

NCF and VCT (2006) Principles for rainforest and grassland restoration in the Anamalai hills. Nature Conservation Foundation, Mysore, and Vattakanal Conservation Trust, Kodaikanal.

http://www.vattakanalconservationtrust.org/Home/some-of-our-rare-and-endangered-plants/grassland-restoration-methodology/synopsis-of-hydrology-papers/the/rubus-and-other-

exotic-weeds/Pambar-Shola-a-success-story-in-conservation/restoration-of-rainforests-and-grassland

Grasslands/Savannas

Grasslands/Savannas>Montane>Australia

Australian Alps Rehabilitation Manual

This Manual has been produced by the Australian Alps Liaison Committee (AALC) to assist managers with the difficult task of protecting and repairing the Alps environment. The Manual provides principles, procedures and best-practice guidelines for rehabilitation projects. The aim is to ensure that rehabilitation is based on the best science and technology, and that an ecological approach to rehabilitation is applied consistently across the Australian Alps.

Practitioners, implementing agencies

Good, R. (2006) Australian Alps Rehabilitation Manual. Australian Alps Rehabilitation Committee.

http://www.australianalps.environment.gov.au/publications/research-reports/pubs/rehabilitation06.pdf

Grasslands/Savannas>Montane>UK

Guidance for the Restoration of Montane Scrub

The practical element of habitat restoration is often the most satisfying aspect of a project. However, bringing together the relevant scientific, fiscal and social strands that lie behind any well-planned project is undoubtedly both challenging and time consuming. For a vulnerable and fragmented species group such as montane scrub, it is imperative to develop a strategic approach that targets limited resources, both spatially and temporally, with regard to appropriate conservation management. This series of five booklets provides practical guidance on restoration issues.

Practitioners, implementing agencies, policymakers

Gilbert, D. (ed.) (2002) Guidance for the Restoration of Montane Scrub. Montane Scrub Action Group Bulletin No. 4.

http://www.mountainwoodlands.org/UserFiles/File/Publications/guidance.pdf

Grasslands/Savannas>Temperate>Europe

Practical Handbook for Seed Harvest and Ecological Restoration of Species-rich Grasslands

Extensively managed semi-natural grassland can be regarded as a seed source useful to establish new species rich areas. Indeed, they are normally rich in species of native provenance and for this reason they can be harvested to obtain propagation material with high ecological value. State of the art techniques to create forage meadows or to restore degraded areas using commercial seed mixtures are not comparable with the target of ecological restoration done with propagation material from semi-natural grassland. Therefore a large number of different harvesting methods and application techniques have been developed for exploitation and application of site-specific seed or plant material. This handbook gives mainly an overview on techniques for seed harvesting and techniques for the establishment of semi-natural grassland.

Practitioners

Scotton, M., A. Kirmer and B. Krautzer (eds.) (2012) Practical handbook for seed harvest and ecological restoration of species rich grasslands. Published by Cleup, printed by Wallig Austria.

http://www.salvereproject.eu/home

Guidelines for Restoration of Species-rich Grasslands

http://www.salvereproject.eu/sites/default/files/Guideline%20restoration%20-%20reduziert.pdf

Guidelines for Seed Harvesting in Species-rich Grasslands

http://www.salvereproject.eu/sites/default/files/Guideline%20seed%20harvesting_reduziert.pdf

Grasslands/Savannas>Temperate>UK

A Practical Guide to the Restoration and Management of Lowland Heathland

This guide is a key source of detailed information on techniques for restoring, maintaining and monitoring lowland heathland habitats, a landscape that has been in decline for decades, with many vulnerable species. It covers the full range of management issues affecting dry heath, wet heath, mire and associated grassland and open water habitats in Britain.

Practitioners, implementing agencies

Symes, N. and J. Day (2003) A Practical Guide to the Restoration and Management of Lowland Heathland. The Royal Society for the Protection of Birds, UK.

http://www.nhbs.com/a_practical_guide_to_the_restoration_and_management_tefno_131202.html&tab_tag=desc

The Lowland Grassland Management Handbook

This second edition includes new sections on managing grassland habitats for particular groups of species: rare vascular plants; lower plants; and reptiles and amphibians. We have added to the special cases chapter by incorporating a section on grasslands in wood pasture and parklands with veteran trees; and we have also added a chapter on monitoring grasslands. A further new chapter explores the agricultural perspective of lowland grassland – particularly relevant in view of the economic pressures on sheep and beef farmers and the growing support for less intensive systems of production. Although creation can never be a substitute for retaining our existing unimproved grasslands, new areas can bring many benefits to both people and wildlife. ln recognition of that fact, a chapter on grassland creation has been added.

Practitioners, implementing agencies

Crofts, A. and R.G. Jefferson (1999) The Lowland Grassland Management Handbook. The Wildlife Trusts, English Nature, the Countryside Council for Wales and Scottish Natural Heritage.

http://publications.naturalengland.org.uk/publication/35034

Grasslands/Savannas>Temperate>USA

The Tallgrass Restoration Handbook: For Prairies, Savannas, and Woodlands

The book is a hands-on manual that provides a detailed account of what has been learned about the art and science of prairie restoration and the application of that knowledge to restoration projects throughout the world. Chapters provide guidance on all aspects of the restoration process, from conceptualization and planning, to execution and monitoring.

Practitioners, implementing agencies

Packard, S. and C. Mutel (1997) The Tallgrass Restoration Handbook: For Prairies, Savannas, and Woodlands. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/T/bo3560858.html

Guidelines for Native Grassland Restoration Projects

These guidelines represent basic and fundamental techniques and procedures that should be addressed when attempting to restore or reconstruct range sites to resemble native prairie plant communities in Texas.

Practitioners, implementing agencies

Dillard, J. (2010) Guidelines for Native Grassland Restoration Projects in Comprehensive Wildlife Management Planning Guidelines for the Post Oak Savannah and Blackland Prairie Ecological Regions, Texas Parks and Wildlife Department.

http://www.tpwd.state.tx.us/landwater/land/private/agricultural_land/pobl2010/Appendix%20K%20Guidelines%20for%20Native%20Grassland%20Restoration%20Projects.pdf

Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: A Guide for the Northeast

Written primarily by state and federal wildlife biologists and foresters, this guide will provide you with important information on how to maintain and restore these habitats on the lands you own or manage. Whether you are a novice or an experienced land manager, this guide will provide helpful information anyone can use to better manage early-successional habitats.

Practitioners, implementing agencies

Oehler, J.D., D.F. Covell, S. Capel and B. Long (eds.) (2006) Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: A Guide for the Northeast. The Northeast Upland Habitat Technical Committee, Massachusetts Division of Fisheries & Wildlife.

http://www.wildlife.state.nh.us/Wildlife/Northeast_Hab_Mgt_Guide.htm

A Guide to Prairie and Wetland Restoration in Eastern Nebraska

Restoration of the following plant community types is covered in this document: tallgrass prairie, mixed-grass prairie, sand prairie, freshwater wet meadow and marsh, Rainwater Basin wet meadow and marsh, and saline wet meadow and marsh. The methods we use are generally affordable and not complicated. To quickly summarize, we handpick and machine harvest seed, do little seed cleaning and broadcast plant with a fertilizer spreader. We do not mow annual weeds during the initial years after planting and manage established restorations with prescribed fire and grazing.

Practitioners, implementing agencies

Steinauer, G. (2003) A Guide to Prairie and Wetland Restoration in Eastern Nebraska. Prairie Plains Resource Institute and Nebraska Game and Parks Commission.

http://prairienebraska.files.wordpress.com/2011/01/restoration-manual.pdf

Shrub-Steppe and Grassland Restoration Manual for the Columbia River Basin

This manual was prepared to help shrub-steppe and grassland restoration practitioners capitalize on the experiences of their predecessors and colleagues within the Columbia River Basin. It includes technical information that veteran shrub-steppe and grassland restoration practitioners in the Columbia Basin indicated were necessary for new restoration project managers to properly plan and successfully execute habitat restoration projects. In addition to providing general guidance, this manual provides specific recommendations, tools and templates to help people quickly take advantage of existing resources and contribute to the growing restoration knowledge base. Case studies are provided for a variety of restoration scenarios so that project planners can see what actions are needed, and learn from the experiences of predecessors as to what worked, how successful they were, what obstacles they had to overcome, and how they overcame those obstacles.

Practitioners, implementing agencies

Benson, J. E., R.T. Tveten, M. G. Asher and P.W. Dunwiddie (2011) Shrub-Steppe and Grassland Restoration Manual for the Columbia River Basin. Washington Department of Fish and Wildlife.

http://wdfw.wa.gov/publications/01330/wdfw01330.pdf

Grasslands/Savannas>Tropical>South Africa

Guidelines for Veld Restoration

These notes give a brief introduction to common veld problems and their treatment

Practitioners, implementing agencies, indigenous and local communities

Renu –Karoo Veld Restoration

http://www.renu-karoo.co.za/Veld%20seeding%20guide.pdf

Caring For Natural Rangelands

This book provides practical guidelines for the management of natural rangelands with worldwide application. It will be essential for those who deal with problems like the control of soil erosion, sensitive road maintenance and invasive alien plant control. Farmers, landscape managers, nature and game reserve managers and students of natural resource management will find instruction and solutions within these pages. The approach is one of understanding the natural ecology system and working ethically within it. The well-tested methods recommended are simple but effective, and if suitably adapted to local conditions will provide remedies for the rehabilitation and maintenance of natural rangelands.

Practitioners, implementing agencies, indigenous and local communities

Coetzee, K. (2004) Caring For Natural Rangelands. University of KwaZulu-Natal Press, Scottsville.

http://www.ukznpress.co.za/?class=bb_ukzn_books&method=view_books&global%5Bfields%5D%5B_id%5D=23

Inland Waters

Inland Waters>Bottomland Forests

A Guide to Bottomland Hardwood Restoration

The primary focus of this guide is to provide information for land managers and landowners who want to reestablish bottomland hardwood forest vegetation, particularly the trees, on lands where they formerly occurred. Restoration and reforestation are approached with the realization that hydrology, as the driving force of wetland ecosystems, must be explicitly considered in all projects. Without the proper hydrologic regime for the site conditions and tree species selected for planting, it is unlikely that a project will be a success. It is assumed that the goal of the audience using this guide is at least the reestablishment of bottomland hardwood forest systems and hopefully the restoration of all functions and values associated with these forests (e.g., storage of floodwaters, water quality improvement, provision of wildlife habitat, etc.).

Practitioners, implementing agencies

Allen, J.A., B.D. Keeland, J.A. Stanturf, A.F. Clewell and H.E. Kennedy (2001) A guide to bottomland hardwood restoration: U.S. Geological Survey, Biological Resources Division Information and Technology Report USGS/BRD/ITR-2000-0011, U.S. Department of Agriculture, Forest Service, Southern Research Station, General Technical Report SRS-40.

http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA396584&Location=U2&doc=GetTRDoc.pdf

Inland Waters>Lakes

The Lakes Handbook, Volume 2: Lake Restoration and Rehabilitation

The Lakes Handbook provides an up-to-date overview of the application of ecologically sound approaches, methods and tools using experience gained around the world for an understanding of lakes and their management. Volume one of the Handbook addresses the physical and biological aspects of lakes pertinent to lake management, emphasising those aspects particularly relevant to large, still bodies of water. Volume two then considers lake management, with particular emphasis on sustainability, restoration and rehabilitation.

Implementing agencies, practitioners

O'Sullivan, P.E. and C.S. Reynolds (2007) The Lakes Handbook, Volume 2: Lake Restoration and Rehabilitation. John Wiley and Sons, New York.

http://onlinelibrary.wiley.com/book/10.1002/9780470750506

Restoration and Management of Lakes and Reservoirs

It has been more than ten years since the last edition of the bestselling Restoration and Management of Lakes and Reservoirs. In that time, lake and reservoir management and restoration technologies have evolved and an enhanced version of this standard resource is long overdue. Completely revised and updated, the third edition continues the tradition of providing comprehensive coverage of the chemical, physical, and biological processes of eutrophication and its control. The authors describe the eutrophication process, outline methods for developing a pre-management and restoration diagnosis-feasibility study, and provide detailed descriptions of scientifically sound management and restoration methods.

Practitioners

Cooke, G.D., E.B. Welch, S. Peterson and S.A. Nichols (2005) Restoration and Management of Lakes and Reservoirs. CRC Press.

http://www.crcpress.com/product/isbn/1566706254

Inland Waters>Lakes>USA

Lake and Reservoir Restoration Guidance Manual

The purpose of the Manual is to provide guidance to the lake manager, lake homeowner, lake association and other informed laypersons on lake and reservoir management, restoration and protection.

Implementing agencies, practitioners, indigenous and local communities

Olem, H. and G. Flock (1990) Lake and Reservoir Restoration Guidance Manual, 2nd edition. EPA 440/4-90-006. Prep. By N. Am. Lake Manage. Soc. for US EPA, Washington, DC.

http://yosemite.epa.gov/water/owrccatalog.nsf/e673c95b11602f2385256ae1007279fe/c122eee5bea6016985256b060072549d!OpenDocument

Inland Waters>Peatlands

Global Peatland Restoration Manual

The following document presents a science based and practical guide to peatland restoration for policy makers and site managers. The work has relevance to all peatlands of the world but focuses on the four core regions of the UNEP-GEF project "Integrated Management of Peatlands for Biodiversity and Climate Change": Indonesia, China, Western Siberia, and Europe. Chapter 1 "Characteristics, distribution, and types of peatlands" provides basic information on the characteristics, the distribution, and the most important types of mires and peatlands. Chapter 2 "Functions & impacts of damage" explains peatland functions and values. The impact of different forms of damage on these functions is explained and the possibilities of their restoration are reviewed. Chapter 3 "Planning for restoration" guides users through the process of objective setting. It gives assistance in questions of strategic and site management planning. Chapter 4 "Standard management approaches" describes techniques for practical peatland restoration that suit individual needs.

Policymakers, implementing agencies, practitioners

Schumann, M. and H. Joosten (2008) Global Peatland Restoration Manual. Institute of Botany and Landscape Ecology, Greifswald University, Germany.

http://www.imcg.net/media/download_gallery/books/gprm_01.pdf

Régénération des Hauts-marais: Bases et Mesures Techniques

Ce guide présente, d'une part, les données de base nécessaires à l'élaboration d'un projet de restauration ou de régénération dans un hautmarais et, d'autre part, décrit précisément l'exécution de mesures techniques de restauration dans les domaines de la végétalisation de surfaces de tourbe nue et des retenues d'eau. Ce guide technique s'adresse aux autorités chargées de la mise en oeuvre de la protection des marais et aux gestionnaires de sites.

Practitioners, implementing agencies

Grosvernier, Ph. and P. Staubli (eds.) (2009) Régénération des hauts-marais: Bases et mesures techniques. L'environnement pratique n° 0918, Office fédéral de l'environnement, Berne.

http://www.bafu.admin.ch/publikationen/publikation/00879/index.html?lang=fr

Inland Waters>Peatlands>Canada

Peatland Restoration Guide

This guide was developed as a practical tool for peat producers. It presents, in an accessible way, the approach that is proposed for restoring milled peatlands. It is based on the research that has been done in Canada in the last 10 years by the PERG, on the application of the

method in restoring over 160 hectares of the Sainte-Marguerite bog in Québec by Planirest Environment Inc. and on the experience of practitioners from Canadian peat producers who shared their knowledge at annual workshops. The approach especially addresses the Northeastern American context, which is characterized by acidic and nutrient-poor residual substrates to restore and treeless open natural peat bogs. The approach was applied successfully in a number of peatlands and was adapted to site-specific conditions.

Implementing agencies, practitioners

English, French

Quinty, F. and L. Rochefort (2003) Peatland Restoration Guide, second edition. Canadian Sphagnum Peat Moss Association and New Brunswick Department of Natural Resources and Energy. Québec, Québec.

http://www.peatmoss.com/pm-restguide.php

Plantation d'Essences Forestières dans le Contexte de la Restauration Ecologique des Tourbières: Un Guide Pratique

Le Groupe de recherche en écologie des tourbières (GRET) a développé une technique de restauration, appelée « transfert de mousse de sphaignes », qui permet le retour des sphaignes, espèces clés des tourbières ombrotrophes. Cette technique consiste à réintroduire des fragments de sphaignes et puis à bloquer les canaux de drainage. Depuis 1990, l'efficacité de cette technique a été démontrée tant au niveau du retour des espèces végétales typiques de tourbière et de la composition de la communauté microbienne qu'à celui du retour à un écosystème accumulateur de tourbe agissant de nouveau comme un puits de carbone.

Practitioners

Hugron, S., J. Bussières and L. Rochefort (2011) Plantation d'essences forestières dans le contexte de la restauration écologique des tourbières: un guide pratique. Groupe de recherche en écologie des tourbières, Université Laval, Québec.

http://www.gret-perg.ulaval.ca/uploads/tx_centrerecherche/Guide_Plantations_arbres_01.pdf

Inland Waters>Peatlands>Ireland

BOGLAND: Sustainable Management of Peatlands in Ireland

This collation of physical, environmental, social, economic and institutional information provides a comprehensive guidance for the development of a support framework or protocol for the sustainable management of peatlands, which is presented in Section 5 of the report. The

protocol delivers an action plan or set of recommendations that should be used to draft a much-needed National Peatland Policy that should ensure that this natural heritage is not lost in the future, but that it is safeguarded and enhanced during a challenging period of economic transition.

Policymakers, implementing agencies

Renou-Wilson, F., T. Bolger, C. Bullock, F. Convery, J. Curry, S. Ward, D. Wilson and C. Müller (2011) BOGLAND: Sustainable Management of Peatlands in Ireland. STRIVE Report Prepared for the Environmental Protection Agency by University College, Dublin.

http://www.epa.ie/downloads/pubs/research/land/STRIVE_75_web_SC.pdf

Inland Waters>Peatlands>UK

The Fen Management Handbook

The Handbook highlights practical techniques but also provides the background science that underpins the different fen management techniques. The handbook is aimed at anyone involved in fen management, creation or restoration from a practical, policy or planning perspective.

Practitioners, implementing agencies, policymakers

McBride, A., I. Diack, N. Droy, B. Hamill, P. Jones, J. Schutten, A. Skinner and M. Street (2011) The Fen Management Handbook. Scottish Natural Heritage, Perth.

http://www.snh.gov.uk/docs/B823264.pdf

Inland Waters>Rivers

River Futures: An Integrative Scientific Approach to River Repair

The book frames the development of integrative river science and its application to river rehabilitation programs develops a coherent set of guiding principles with which to approach integrative river science considers the application of cross-disciplinary thinking in river rehabilitation experiences from around the world examines the crossover between science and management, outlining issues that must be addressed to promote healthier river futures Case studies explore practical applications in different parts of the world, highlighting approaches to the use of integrative river science, measures of success, and steps that could be taken to improve performance in future efforts.

Practitioners, implementing agencies, policymakers

Brierley, G.J. and K.A. Fryirs (eds.) (2008) River Futures: An Integrative Scientific Approach to River Repair. Island Press, Washington, DC.

http://islandpress.org/ip/books/book/islandpress/R/bo7019287.html

Inland Waters>Rivers>Australia

River Restoration Manual

This manual is a series of guidelines that provides a guide to the nature, rehabilitation and long-term management of waterways in Western Australia and is intended to be used by river restoration group coordinators and other people who are actively involved with river restoration.

Implementing agencies, practitioners, indigenous and local communities

Government of Western Australia, Department of Water

http://www.water.wa.gov.au/Managing+water/Rivers+and+estuaries/Restoring/River+restoration+manual/default.aspx

A Rehabilitation Manual for Australian Streams

This manual is designed to help those professional managers who are accepting the challenge of rehabilitating the physical and biological condition of Australian streams. The concepts provide a firm basis for planning a rehabilitation strategy, while the typical problems and tools provide resources that could be useful to the manager. It is important to emphasise that this is not a catchment or stream management manual. There are many reasons to intervene in streams and catchments that are not related to rehabilitation of the natural stream values. Thus, the manual will only touch on issues such as erosion control, water supply, flooding, and the sociology of management, in so far as they affect rehabilitation.

Practitioners, implementing agencies

Rutherfurd, I.D., K. Jerie and N. Marsh (2000) A Rehabilitation Manual for Australian Streams. Land and Water Resources Research and Development Corporation, Australia.

http://www.ecrr.org/publication/guidelines_doc7_1.pdf

http://www.ecrr.org/publication/guidelines_doc7_2.pdf

Inland Waters>Rivers>New Zealand

Gully Restoration Guide: A Guide to Assist in the Ecological Restoration of Hamilton's Gully System

The Gully Restoration Guide has been designed to help you begin your own gully restoration project. It gives information on the different stages that a restoration project will go through in an easy to follow, step by step layout. See the useful references available in the Appendices for more information to plan your project.

Practitioners, indigenous and local communities

Wall, K. and B.D. Clarkson (2006) Gully restoration guide: A guide to assist in the ecological restoration of Hamilton's gully system, 3rd Revised Edition. Hamilton, Hamilton City Council.

http://www.gullyguide.co.nz/files/Gully_Guide_Mar07.pdf

Inland Waters>Rivers>UK

Manual of River Restoration Techniques

This manual is presented in 11 separate parts, each part encompassing a significant activity, or objective, that may typically be included in a restoration project brief with examples of techniques that may be useful in achieving the specific objectives.

Practitioners, implementing agencies

The River Restoration Centre, UK

http://www.therrc.co.uk/rrc_manual.php

Inland Waters>Rivers>USA

Stream Corridor Restoration: Principles, Processes, and Practices

This document is a result of an unprecedented cooperative effort among fifteen Federal agencies and partners to produce a common reference on stream corridor restoration. It responds to a growing national and international public interest in restoring stream corridors. Increasingly, feature articles, case studies, and published papers focus on stream corridors as critical ecosystems in our living environment. The recent 25th anniversary of the Clean Water Act also has helped focus attention on stream corridor restoration

Practitioners

FISWRG (2001) Stream Corridor Restoration: Principles, Processes, and Practices. Federal Interagency Stream Restoration Working Group, USA.

http://www.ecrr.org/publication/guidelines_doc6.pdf

Stream Habitat Restoration Guidelines

The purpose of the Stream Habitat Restoration Guidelines (SHRG) is to promote process based natural stream restoration, rehabilitating aquatic and riparian ecosystems. These guidelines advance a watershed scale assessment of the stream system, establishing goals, objectives and design for restoring optimum sustainable native biodiversity, using principles of landscape ecology and integrated aquatic ecosystem restoration. While a number of specific watershed assessment, characterization, project design and construction approaches are presented in this volume, these guidelines do not offer a "cookbook" approach that provides every step and equation along the way. Rather, the intent is to provide readers with a comprehensive list of factors and criteria to consider, which are essential to make informed decisions when planning and designing stream restoration and rehabilitation work. Readers are strongly cautioned not to pluck and apply individual techniques from these guidelines without first conducting the necessary watershed and reach based assessments and analysis.

Practitioners, implementing agencies

Washington State Aquatic Habitat Guidelines Program (2012) Stream Habitat Restoration Guidelines. Washington Department of Fish and Wildlife.

http://wdfw.wa.gov/publications/01374/wdfw01374.pdf

California Riparian Habitat Restoration Handbook

This handbook provides practitioners, regulators, land managers, planners, and funders with basic strategies and criteria to consider when planning and implementing riparian conservation projects. The handbook should be used for planning projects, creating budgets, and assessing restoration success. One aim is to provide a common language for riparian restoration, appropriate planning of projects and effective restoration on the ground. Ecological, biological, and regulatory components of a riparian restoration project are described.

Implementing agencies, practitioners

River Partners (2009) California Riparian Habitat Restoration Handbook, Second edition. River Partners.

http://www.conservation.ca.gov/dlrp/watershedportal/InformationResources/Documents/Restoration_Handbook_Final_Dec09.pdf

Guidelines for Coastal Georgia Riparian Buffer Restoration

The goal of the document is to provide guidance on implementing projects to restore coastal riparian buffers in order to reduce pollutants in our coastal waters as well as provide important aquatic and wildlife habitat. In addition, the purpose of these guidelines is to provide private landowners, private consultants, and local organizations and government agencies with the technical information and/or resources necessary to successfully plan, design, establish, and maintain coastal streamside riparian buffers. The intent of the document, however, is not to provide bioengineering techniques which may be necessary in the stabilization and restoration of coastal riparian buffers.

Implementing agencies, practitioners, indigenous and local communities

Giovengo, K. (?) Guidelines for Coastal Georgia Riparian Buffer Restoration. University of Georgia Marine Extension Service.

http://www.coastscapes.org/Library/UGAGuidelines%20for%20Coastal%20Georgia%20Riparian%20Buffer%20RestorationFINAL.pdf

Restoration Field Guide: A User-Friendly Guide for Restoration Techniques in Riparian Habitats

The purpose of this field guide is to share the experiences of the Land Conservancy staff and other restoration organizations gained during implementation of restoration projects so fellow project coordinators can better plan construction projects. It is not intended to be a comprehensive restoration manual, but rather a user-friendly guide to specific restoration techniques and trouble-saving tips. The concepts presented here are field tested, and will help users prepare for and solve common problems that may arise during a project.

Practitioners, implementing agencies

Stark, B. and K. Dettman (2010) Restoration Field Guide: A User-Friendly Guide for Restoration Techniques in Riparian Habitats. The Land Conservancy of San Luis Obispo County.

http://www.lcslo.org/pdfs/restoration/OSPR%20Guide_2010.pdf

Inland Waters>Wetlands

Ramsar Convention Principles and Guidelines for Wetland Restoration

The principles presented here provide the underlying ideas that form the foundation of a successful restoration project, and as such they should be integrated into national wetland policy. The guidelines presented here provide a step-by-step process guiding the identification, development and implementation of a restoration project, and as such they can be integrated

into administrative guidelines. However, every restoration project is unique, and whilst these principles and guidelines are designed to be useful in many situations, they are neither universally applicable nor definitive.

Policymakers, implementing agencies

The Ramsar Convention on Wetlands (2002) Principles and Guidelines for Wetland Restoration. COP8 Resolution VIII.16.

http://www.ramsar.org/cda/en/ramsar-documents-guidelines-principles-and-20878/main/ramsar/1-31-105%5E20878_4000_0__

Addressing Change in Wetland Ecological Character: Addressing Change in the Ecological Character of Ramsar Sites and other Wetlands

This Handbook provides the guidance adopted by Contracting Parties on procedures and responses concerning what to do if the ecological character of a designated Ramsar Site is detected to have deteriorated, or to be likely to deteriorate, in particular as a result of human-induced change or likely change.

Policymakers

Ramsar Convention Secretariat (2010) Addressing change in wetland ecological character: Addressing change in the ecological character of Ramsar Sites and other wetlands. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 19. Ramsar Convention Secretariat, Gland, Switzerland.

http://www.ramsar.org/pdf/lib/hbk4-19.pdf

Restoring Wetlands for Wildlife Habitat

This chapter contains sections titled: Introduction, Approaches to Restoration of Wildlife, Planning the Restoration of Wetlands for Wildlife Habitat, Planning the Long Term Management, Monitoring Success, Case Study: Transplantation of a Mire.

Implementing agencies, practitioners

Ramseier, D., F. Klötzli, U. Bollens and J. Pfadenhauer (2009) Restoring Wetlands for Wildlife Habitat in The Wetlands Handbook (eds. E. Maltby and T. Barker) Wiley, Oxford.

http://onlinelibrary.wiley.com/doi/10.1002/9781444315813.ch34/summary

Integrated Constructed Wetlands: Guidance Document for Farmyard Soiled Water and Domestic Wastewater

This Guidance Document is prepared for the application of the 'Integrated Constructed Wetland' (ICW) concept in the management of point sources of farmyard soiled water and domestic wastewater. The purpose of this Guidance Document is to provide comprehensive guidance for the assessment, design and construction of ICW systems. This document parallels a similar manual for Scotland and Northern Ireland and existing guidelines for Finland. The steps are outlined, ranging from assessing the appropriateness of an ICW in the first instance, to its design, installation and the monitoring process. This involves several decisions at each stage of the assessment and development process. The experience and results, upon which this document is based, indicate that an effective, robust and sustainable ICW can be established in a range of suitable locations. There will, however, be variations in design and construction reflecting the site's location and its specific characteristics.

Implementing agencies, practitioners, indigenous and local communities

(2010) Department of the Environment, Heritage and Local Government, Ireland.

http://www.environ.ie/en/Publications/Environment/Water/FileDownLoad,24931,en.pdf

Guiding Principles for Constructed Treatment Wetlands: Providing Water Quality and Wildlife Habitat

The Workgroup decided to focus upon and encourage those projects that not only provide water treatment, but also strive to provide water reuse, wildlife habitat, and public use benefits. While this document focuses on municipal wastewater treatment wetlands, many of the principles can be used to help guide other treatment wetland projects, such as those treating acid mine drainage, agricultural and storm water runoff, livestock and poultry operations, and industrial wastewater. Information from specific case study projects, and scientific literature was used to develop these principles, along with technical information provided by constructed wetlands experts and dialogue during the Workgroup meetings.

Implementing agencies, practitioners

Interagency Workgroup on Constructed Wetlands (1999) Guiding Principles for Constructed Treatment Wetlands: Providing Water Quality and Wildlife Habitat. U.S. Environmental Protection Agency, Army Corps of Engineers, Fish and Wildlife Service, Natural Resources Conservation Services, National Marine Fisheries Service, and Bureau of Reclamation.

http://www.calpoly.edu/~cri/docs/guidingprinciples.pdf

Inland Waters>Wetlands>Australia

Wetland Habitats: A Practical Guide to Restoration and Management

Wetland Habitats is a practical and easy to use manual for wetland restoration and conservation of diverse animal species. Covering all the recent work in this field, among other significant issues it discusses making the most of dams and created wetlands; reversing the effects of drainage, grazing, weirs, deteriorating water quality, and associated algal problems; captive breeding and reintroduction; and controlling weeds and vermin. The book describes a range of potential problems encountered during restoration efforts and approaches to dealing with them, so that readers will be able to make informed decisions about wetlands on their own properties. It also explains how to set realistic targets for wetland restoration as well as longer-term goals for management, and includes colour photographs of diverse wetland habitats and the animals that rely on them. The examples draw on a wide range of wetland animals including some which aren't often found in wetlands on private properties, but the primary emphasis is on the ecology, interactions and management of species and other aspects of management that will be of most use to landholders with wetlands in need of rejuvenation.

Implementing agencies, practitioners, indigenous and local communities

Romanowski, N. (2010) Wetland Habitats: A Practical Guide to Restoration and Management. CSIRO Publishing, Australia.

http://www.publish.csiro.au/nid/21/pid/6349.htm

Inland Waters>Wetlands>Europe

European Wet Grassland: Guidelines for Management and Restoration

Takes a Northern and Central European overview of the importance of wet grassland to both wildlife and people, and concentrates on the practical aspects of management and rehabilitation. The guidelines largely comprise case studies from the region and aim to: share practical management and restoration experience; present alternative management and restoration options; and describe the functions of wet grassland, e.g., flood storage and nutrient removal.

Practitioners, implementing agencies

Benstead, P., P. Jose, C. Joyce and P.M. Wade (1999) European Wet Grassland: Guidelines for Management and Restoration. The Royal Society for the Protection of Birds, UK.

http://www.nhbs.com/european_wet_grassland_tefno_87098.html

Inland Waters>Wetlands>New Zealand

Wetland Restoration: A Handbook for New Zealand Freshwater Systems

This handbook brings together expertise from specialists and groups actively engaged in restoring wetlands throughout the country. The handbook builds on regionally based restoration guides and provides a detailed, comprehensive ecosystem approach toward understanding, protecting and enhancing our remaining wetlands. It is targeted at those who plan to, and those who already are making a difference to improving wetlands, and is written in a way that can easily be understood and importantly, acted on.

Implementing agencies, practitioners, indigenous and local communities

Peters, M. and B. Clarkson (2010) Wetland Restoration: A Handbook for New Zealand Freshwater Systems. Landcare Research – Manaaki Whenua Press, Lincoln.

http://www.landcareresearch.co.nz/services/biocons/wetlands/

Wetland Restoration Guide

You are most likely to be working with an existing wetland. If you would like simply to restore a wetland closer to its original state, you would be doing less construction work and more weed control, while ensuring water regimes are fully functioning. Your strategies for weed control would be more about maintaining the native plant cover you have and encouraging those plants to spread. Your plantings would not need to be as substantial, as you would be more likely to be supplementing or adding buff ers to what you already have. Restoring degraded wetlands can sometimes be quite complex, but can also be as simple as knocking out a few willows and building a fence.

Indigenous and local communities, implementing agencies, policymakers

NZ Department of Conservation, Environment Bay of Plenty and Fish & Game (2007)

http://www.doc.govt.nz/upload/documents/conservation/land-and-freshwater/wetlands/wetland-restoration-guide.pdf

A Beginner's Guide to Wetland Restoration

Wetlands were once considered useless wastelands or potential pasture. Today, we recognise that they are important and hugely diverse ecosystems – and that conserving and restoring them benefits not only wetland species, but also many other aspects of our environment and way of life.

Indigenous and local communities, practitioners

Greater Wellington Regional Council (2009)

http://www.gw.govt.nz/assets/Our-Environment/Ecosystem-Restoration--Protection/6529ABeginnersguides12690.pdf

Restoring a Wetland

The Waikato Regional Council, New Zealand presents a simple flowchart to find out more about each step in the restoration process and allows the user to create their own Wetland Plan.

Practitioners, indigenous and local communities

Waikato Regional Council

http://www.waikatoregion.govt.nz/Environment/Natural-resources/Water/Freshwater-wetlands/Restoring-a-wetland/

Inland Waters>Wetlands>UK

Wetland Restoration Manual

The Wildlife Trusts' definitive work on wetland restoration, creation and management, this 16-chapter, 660-page, ring-bound manual contains all the information you will need as a conservation professional to work effectively on wetland projects. The manual contains guidance on: the background to wetland issues; water-level control; physical works; the main UK wetland habitat types, their protection and restoration; post-industrial land opportunities for wetlands; invasive species; survey and monitoring; and canals.

Practitioners, implementing agencies

The Wildlife Trusts' Water Policy Team (2005) Wetland Restoration Manual. The Wildlife Trusts, UK.

http://www.nhbs.com/wetland_restoration_manual_tefno_112676.html

Inland Waters>Wetlands>USA

Wetland Creation and Restoration, Volumes 1 and 2

In 1985, the Environmental Protection Agency (EPA) began a multiyear research program to examine the scientific issues which result from wetland creation and restoration. As part of the overall program, they embarked on an effort to synthesize the knowledge accumulated to date into a statement of the status of the science of wetland creation and restoration. The Agency views the document as a first step in meeting the needs of wetlands regulators for an analytical framework from which to make decisions concerning wetland creation and restoration.

Policymakers, implementing agencies

US Environmental Protection Agency (1989)

http://yosemite.epa.gov/water/owrcCatalog.nsf/e673c95b11602f2385256ae1007279fe/a45561f6b6f2b0e185256b0600725a54!OpenDocument

http://yosemite.epa.gov/water/owrccatalog.nsf/065ca07e299b464685256ce50075c11a/82d3cb414a7eaaff85256d09005094f7!OpenDocument

An Introduction and User's Guide to Wetland Restoration, Creation, and Enhancement

Given the broad scope of the subject matter, this document is designed to achieve two goals: Introduce non-technical readers to the basics of wetland projects including planning, implementing, and monitoring, and direct interested persons to documents and resources specific to a particular region or wetland type. The document is organized around these two goals. The text gives information on wetlands, background on the practice of restoration, and information on the process involved in undertaking a wetland project. The appendices provide documents, web sites, agencies, and other resources for finding additional information and advice on restoration, creation, and enhancement projects.

Implementing agencies, practitioners

Interagency Workgroup on Wetland Restoration (2003) An Introduction and User's Guide to Wetland Restoration, Creation, and Enhancement. Environmental Protection Agency, Washington, DC.

http://www.epa.gov/owow/wetlands/pdf/restdocfinal.pdf

Restoration, Creation, and Recovery of Wetlands

In the past, people used wetland plants and animals for shelter and food. More recently, people have become more aware of other benefits that wetlands provide water-quality improvement, flood attenuation, esthetics, and recreational opportunities. Now, it is recognized that numerous losses are incurred when a wetland is damaged or destroyed. Restoration and creation can help maintain the benefits of wetlands and their surrounding ecosystems, and at the same time accommodate the human need for development.

Policymakers, implementing agencies

Kentula, M.E. (1999) Restoration, Creation, and Recovery of Wetlands in J.D. Fretwell, J.S. Williams, and P.J. Redman (eds.) National Water Summary on Wetland Resources, USGS Water Supply Paper 2425.

http://water.usgs.gov/nwsum/WSP2425/restoration.html

Principles for the Ecological Restoration of Aquatic Resources

These principles focus on scientific and technical issues, but as in all environmental management activities, the importance of community perspectives and values should not be overlooked. The presence or absence of public support for a restoration project can be the difference between positive results and failure. Coordination with the people and organizations that may be affected by the project can help build the support needed to get the project moving and ensure long-term protection of the restored area. In addition, partnership with stakeholders can also add useful resources, ranging from money and technical expertise to volunteer help with implementation and monitoring.

Implementing agencies, practitioners, indigenous and local communities, policymakers

US Environmental Protection Agency (2000) Principles for the Ecological Restoration of Aquatic Resources. EPA841-F-00-003. Office of Water (4501F), United States Environmental Protection Agency, Washington, DC.

http://www.epa.gov/owow/wetlands/restore/principles.html

Restoration of Temperate Wetlands

This book provides a broad overview of current information and experience of wetland restoration. In some cases it highlights the lack of knowledge available and illustrates how difficult it can be to make informed decisions. With contributions from Scandinavia, Europe, Australia, the USA and Canada, outlining the latest research and observations from a range of international wetland scientists and practitioners, this book provides a critical review of current information and knowledge and gives insights into many aspects of wetland restoration, with a focused approach to the ecological principles that underpin it.

Practitioners, implementing agencies

Wheeler, B.D., S.C. Shaw, W.J. Fojt and R.A. Robertson (eds.) (1995) Restoration of Temperate Wetlands. John Wiley and Sons, New York.

http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471951056.html

Restoring Prairie Wetlands: An Ecological Approach

Wetland restorations are an important part of natural resource conservation in the Midwest. However, many wetland restorations have had significant problems, from lack of flooding to poor revegetation. This book is a guide to restoring wetlands in the southern portion of the

prairie pothole region, covering Iowa, Minnesota, and South Dakota. Criteria for selecting suitable restoration sites, designing restorations, and evaluating restorations are presented here. The book also provides information on plants, animals, soils, and hydrology of prairie potholes.

Practitioners, implementing agencies

Galatowitsch, S.M. and A. van der Valk (1998) Restoring Prairie Wetlands: An Ecological Approach. John Wiley and Sons, New York.

http://books.google.com/books/about/Restoring_prairie_wetlands.html?id=tVbHsfy4NHAC

Minnesota Wetland Restoration Guide – Revegetation Chapter 5

This Guide was first published in December of 1992. The original document provided technical guidelines for restoring and managing drained wetlands in Minnesota with an emphasis on engineering design. In 2002 BWSR published "Native Vegetation in Restored and Created Wetland, its Establishment and Management in Minnesota and the Upper Midwest" and more recently developed additional vegetation guidance with "Restoring and Managing Native Wetland and Upland Vegetation". These documents were primarily developed to address the vegetative needs for wetland mitigation projects.

Practitioners

Wenzel, P.E. (1992) Minnesota Wetland Restoration Guide. Minnesota Board of Water and Soil Resources, St. Paul.

http://www.bwsr.state.mn.us/publications/wetland_restoration/5-Vegetation.pdf

Restoring and Managing Native Wetland and Upland Vegetation

In the summer of 2002 the Minnesota Wetland Conservation Act (WCA) was amended to include requirements that wetland mitigation sites must have vegetation management plans developed and implemented. The intended goal is to ensure that restored wetlands develop into the desired wetland type meeting the function and value requirements of WCA. The following guidelines were originally written for restoring and managing newly created transportation (Mn/DOT and BWSR Local Road) wetland mitigation sites.

Practitioners, Implementing Agencies

Jacobson, R. (2006) Restoring and Managing Native Wetland and Upland Vegetation. Minnesota Board of Soil & Water Resources and the Minnesota Department of Transportation.

http://www.shootingstarnativeseed.com/documents/BWSR-wetland-guide.pdf

A Citizen's Guide to Wetland Restoration: Approaches to Restoring Vegetation Communities and Wildlife Habitat Structure in Freshwater Wetland Systems

This guidebook is designed to help citizens restore and improve wetland and riparian habitats within the Puget Lowland. The intended audience is private landowners who have access to a degraded wetland or stream, and wish to improve the function or landscape aesthetics of the site without involving earthwork or altering water flows. As a result, planting vegetation and installing wildlife habitat features are the main restoration techniques described in this guidebook.

Indigenous and local communities, practitioners, implementing agencies

Vanbianchi, R. et al. (1994) A Citizen's Guide to Wetland Restoration: Approaches to Restoring Vegetation Communities and Wildlife Habitat Structure in Freshwater Wetland Systems. US Environmental Protection Agency, Region 10, Water Division.

http://yosemite.epa.gov/water/owrccatalog.nsf/9da204a4b4406ef885256ae0007a79c7/6fa2ff96f9fc17c98525767100642fc1!OpenDocument

Managing Your Restored Wetland

Today, many people realize the value of wetlands and are coming together to restore some of the lost wetland acreage. Through programs such as the U.S. Fish and Wildlife Service Partners for Wildlife, landowners are restoring wetlands on previously drained land and enjoying the benefits wetlands provide. In this manual, we will briefly describe where wetland restoration is possible and how it is done. The majority of the manual will focus on what you, the landowner, can expect from your restored wetland and what you will need to do to maintain and manage your wetland.

Practitioners, indigenous and local communities

Cole, C.A., T.L. Serfass, M.C. Brittingham and R.P. Brooks (1996) Managing Your Restored Wetland. U.S. Fish and Wildlife Service, North American Waterfowl Management Plan and The Pennsylvania State University.

http://pubs.cas.psu.edu/freepubs/pdfs/uh086.pdf

Protecting and Restoring Wetlands: Strengthening the Role of Local Governments

This paper has been written to help strengthen local government wetland protection and restoration efforts. It first considers options for local governments to strengthen their

protection and restoration efforts. Many web site references are provided for those wishing more detailed information. It then considers measures federal agencies, states, land trusts and others could take to encourage and help local governments strengthen their efforts.

Policymakers, implementing agencies, indigenous and local communities

Kusler, J. (2007) Protecting and Restoring Wetlands: Strengthening the Role of Local Governments. Association of State Wetland Managers, Inc., USA.

http://aswm.org/pdf_lib/local_government_051507.pdf

Protecting and Restoring Wetlands: A Guide for Land Trusts

This guide has been written to help land trusts protect and restore wetlands and related aquatic and riparian ecosystems. References are provided to land trust websites for readers who wish more detailed information.

Implementing agencies, indigenous and local communities

Kusler, J. (2009) Protecting and Restoring Wetlands: A Guide for Land Trusts. Association of State Wetland Managers, Inc., USA.

http://aswm.org/pdf_lib/land_trust_011509.pdf

4. Landscape-Scale Guidance and Guidelines

Forests Landscapes

Forest Landscape Restoration: A Learning Network "Principles and Guidelines"

The aim of this document is to capture these fundamental elements in some guiding principles to support institutions in their efforts to improve the governance and management of rural landscapes which may include some natural areas and native forest. We consider it important to provide a comprehensive overview of the principles that can guide successful decision making and management. We are aware that few institutions and/or projects will have the resources to undertake the level of assessment and support that is described. Nevertheless, we hope that the document provides a useful framework to support decentralized landscape management.

Policymakers, implementing agencies

Global Partnership on Forest Landscape Restoration

http://www.forestlandscaperestoration.org/learning-resources/principles-guidelines/

Restoring Forest Landscapes: An Introduction to the Art and Science of Forest Landscape Restoration

It explains the Forest Landscape Restoration (FLR) concept and describes its main elements in chapters on adaptive management, landscape mosaics, landscape dynamics, stakeholder approaches, the identification of site-level options, hands-on site-level forest restoration and rehabilitation strategies, scenario modeling, and monitoring and evaluation. The result is by far the most comprehensive and easy-to-understand treatment of FLR yet written. It complements other work being carried out within the Global Partnership on Forest Landscape Restoration.

Implementing agencies

English, Spanish, French

ITTO and IUCN (2005) Restoring Forest Landscapes: An Introduction to the Art and Science of Forest Landscape Restoration. ITTO Technical Series No. 23, Yokohama.

http://www.itto.int/technical_report/?pageID=2

Forest Restoration in Landscapes: Beyond Planting Trees

This book represents the collective body of knowledge and experience of WWF and its many partners--which is collected here for the first time and which will be invaluable to all of those working in the field. This guide will serve as a first stop for practitioners and researchers in any organization or region and as a key reference on the subject. Along with concise, practical information for a variety of specific systems and issues, it gives many suggestions for further research.

Policymakers, implementing agencies, practitioners

Mansourian, S., D. Vallauri and N. Dudley (eds.) (2005) Forest Restoration in Landscapes: Beyond Planting Trees. Springer, New York.

http://www.bf.uni-lj.si/fileadmin/groups/2716/downloads/%C4%8Clanki_vaje/2.VS%C5%A0/Mansurian_Forest_restoration_landscapes.pdf

Optimizing Synergies on Forest Landscape Restoration between the Rio Conventions and the UN Forum on Forests to Deliver Good Value for Implementers

Identifying potential interlinkages and options is important, but what is needed beyond that is: 'implementation activities, including where pooled efforts would be cost-effective'. This article will take the forest synergies discussion one step further by identifying a basis for encouraging effective synergistic implementation of actions in support of the Rio conventions – as well as the UN Forum on Forests (UNFF) programme of work – in the area of forest landscape restoration.

Policymakers

Saint-Laurent, C. (2005) Optimizing Synergies on Forest Landscape Restoration Between the Rio Conventions and the UN Forum on Forests to Deliver Good Value for Implementers. RECIEL 14 (1).

http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9388.2005.00422.x/abstract

Forests Landscapes>Africa

La Restauration des Paysages Forestiers en Afrique

L'atelier avait comme objectifs spécifiques de 1) Partager les informations sur les outils disponibles pour soutenir la restauration du paysage forestier (RPF), y compris les Directives de l'OIBT pour la restauration, la gestion et la réhabilitation des forêts tropicales dégradées et secondaires, et l'apprentissage en ligne à travers la plate-forme « Partenariat Global sur la

Restauration des Paysages Forestiers (PGRPF); 2) Identifier les besoins d'apprentissage et contribuer aux conseils à donner au réseau d'apprentissage du PGRPF; 3) Elaborer une stratégie pour la mise en place d'un "core group" en Afrique en général et dans les pays des Grands Lacs en particulier, des éléments sur le plan d'action et d'une feuille de route, et 4) Proposer les principes et directives de la RPF pour l'Afrique.

Policymakers

UICN Programme pour la Conservation des Forêts

http://www.forestlandscaperestoration.org/media/uploads/File/great_lakes_flr_guidelines_intu_webversion.pdf

Forests Landscapes>Ghana

Guidelines for Forest Restoration in Ghana

At the National workshop participants reiterated the need for building the capacity of the stakeholders in practical use of the techniques. They also reiterated the need for the production of Ghana specific manual on Restoring Forest Landscapes, which can be used as a guide and a reference material. Thus a Participatory Resource Assessment was used to determine what should be the principles and actions to that can form the guidelines from stakeholders in six degraded forest areas. The results were compiled and three workshops were held at which all stakeholders validated their responses. A final workshop was held to complete the guidelines. Official approval of these guidelines is being sought.

Policymakers

Blay, D. (?) FORIG

http://www.forestlandscaperestoration.org/media/uploads/File/ghana_flr_guidelines_intu_webversion.pdf

Forests Landscapes>Indonesia

Guideline: Forest Landscape Restoration in Indonesia

This guideline was developed by National Working Group on Landscape Restoration in Indonesia under International Workshop of Forest Landscape Restoration in Batu Karu, Bali, 12-15 May 2009, supported by ITTO and IUCN.

Policymakers

English, Bahasa Indonesia

National Working Group on Landscape Restoration in Indonesia (2009)

http://www.ideastransformlandscapes.org/media/uploads/Guidance_FLR_Indonesia__eng.pdf

Prescribed Fire

Fire Management: Voluntary Guidelines - Principles and Strategic Actions

These non-binding, voluntary guidelines set out a framework of priority principles that will aid in the formulation of policy, legal, regulatory and other enabling conditions and strategic actions for more holistic approaches to fire management. They have been tailored primarily for land-use policy makers, planners and managers in fire management, including states, the private sector and non-governmental organizations. The guidelines for fire management cover the positive and negative social, cultural, environmental and economic impacts of natural and planned fires in forests, woodlands, rangelands, grasslands, agricultural and rural/urban landscapes. The fire management scope includes early warning, prevention, preparedness (international, national, subnational and community), safe and effective initial attack on incidences of fire and landscape restoration following it.

Policymakers, implementing agencies

FAO (2006) Fire management: voluntary guidelines. Principles and strategic actions. Fire Management Working Paper 17, Rome.

ftp://ftp.fao.org/docrep/fao/009/j9255e/j9255e00.pdf

Living with Fire: Sustaining Ecosystems & Livelihoods through Integrated Fire Management

Fire management is the range of possible technical decisions and actions available to prevent, maintain, control or use fire in a given landscape. The primary premise of this paper is that more sophisticated fire management technologies are not likely to solve the problem of destructive wildfires, nor are they going to be effective in re-establishing ecologically appropriate fire regimes in places that need to burn. There is a need to integrate socio-cultural realities and ecological imperatives with technological approaches to managing fires. This paper sets forth a framework that we are calling Integrated Fire Management which leads to ecologically and socially appropriate approaches to managing fires and addressing fire-related threats on conservation lands.

Implementing agencies, practitioners

Myers, R.L. (2006) Living with Fire: Sustaining Ecosystems & Livelihoods through Integrated Fire Management. Global Fire Initiative, The Nature Conservancy, Tallahassee.

http://www.fireparadox.org/telechargements/2006_Myers_Integrated_Fire_Management.pdf

Prescribed Fire: Case Studies, Decision Aids, and Planning Guides

The use of fire by humans has a long and storied history, as has been chronicled globally by noted fire historian Stephen Pyne. However, the fact that fire is both a management tool and a process was generally unappreciated until about 30 years ago; and, to a certain extent, full recognition of this point is still lacking today.

Policymakers, implementing agencies

Alexander, M.E. and D.A. Thomas (eds.) (2006) Prescribed Fire: Case Studies, Decision Aids, and Planning Guides. Fire Management Today 66(1).

http://www.fs.fed.us/fire/fmt/fmt_pdfs/FMT66-1.pdf

Protected Areas

Ecological Restoration for Protected Areas: Principles, Guidelines and Best Practice

This document is intended to guide the efforts of protected area managers and partner organizations aimed at restoring natural, cultural and other important values of protected areas. Restoration in and around protected areas is a key priority of the IUCN and the Convention on Biological Diversity (CBD)'s Programme of Work on Protected Areas (PoWPA). The CBD PoWPA encourages States to: "Establish and implement measures for the rehabilitation and restoration of the ecological integrity of protected areas" (Section 1.5.3 of the Programme of Work on Protected Areas).

English, French, Spanish

Implementing agencies, policymakers, practitioners, indigenous and local communities

Keenleyside, K.A., N. Dudley, S. Cairns, C.M. Hall and S. Stolton (2012) Ecological Restoration for Protected Areas: Principles, guidelines and best practices. Gland, Switzerland: IUCN.

http://www.iucn.org/about/union/commissions/wcpa/wcpa_puball/wcpa_bpg/

http://www.iucn.org/pa_guidelines

Guidelines for Protected Areas Legislation

These guidelines are the result of a joint effort, led by the IUCN Environmental Law Centre, to update and expand the 1980 guidelines with practical state-of-the-art guidance for those interested in strengthening protected areas legislation, including legal drafters, protected areas professionals, policy makers, governmental and non-governmental stakeholders, and members of the academic community.

Policymakers

Lausche, B. (2011) Guidelines for Protected Areas Legislation. IUCN, Gland.

http://data.iucn.org/dbtw-wpd/edocs/EPLP-081.pdf

Biodiversity Issues for Consideration in the Planning, Establishment and Management of Protected Area Sites and Networks

The original contributions are considered so valuable in themselves that they deserve publication. They highlight critical issues relating to the selection, planning and effective management of protected areas for policymakers, managers, and other actors in the protected area community.

Policymakers, implementing agencies

Secretariat of the Convention on Biological Diversity (2004). Biodiversity issues for consideration in the planning, establishment and management of protected area sites and networks. CBD Technical Series No. 15, Montreal.

http://www.cbd.int/doc/publications/cbd-ts-15.pdf

Guidelines for Planning and Managing Mountain Protected Areas

This publication is directed to those fortunate individuals who have some role in managing protected areas in mountain environments. It is by nature a handbook of principles and practical guidelines aimed at conserving the rich mountain heritage of nature and culture in the high places of our world.

Implementing agencies

Hamilton, L. and L. McMillan (eds.) (2004) Guidelines for Planning and Managing Mountain Protected Areas. IUCN, Gland, Switzerland and Cambridge, UK.

https://library.conservation.org/Published%20Documents/2009/2004%20IUCN,%20Guidelines%20for%20Planning%20and%20Managing%20Mountain%20Protected%20Areas.pdf

Protected Areas>Canada

Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas

This document was developed to guide policy-makers and practitioners in their efforts to improve ecological integrity in parks and other protected natural areas. Restoration of ecological integrity is the over-arching goal of ecological restoration, but it also includes the meaningful engagement of partners, stakeholders, communities, general public, and visitors. Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas provides a practical framework for making consistent, credible, and informed decisions about ecological restoration. The accompanying case studies demonstrate best practices in the application of these principles, guidelines, and implementation framework.

Policymakers, implementing agencies, practitioners, indigenous and local communities

English, French, Spanish

Parks Canada and the Canadian Parks Council (2008) Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas. Environment Canada, Ottawa.

http://www.pc.gc.ca/eng/progs/np-pn/re-er/index.aspx

Protected Areas>Colombia

Estrategia Nacional De Restauración Ecológica De Parques Nacionales Naturales De Colombia

El presente documento de Estrategia elaborado por la Unidad de Parques Nacionales Naturales ofrece los lineamientos para el desarrollo de procesos de Restauración Ecológica en Áreas Protegidas, así como con el Decreto 2372 de 2010 en relación con el Sistema Nacional de Áreas Protegidas, las categorías de manejo que lo conforman y se dictan otras disposiciones. Igualmente, tiene en cuenta los Principios y Directrices para la Restauración Ecológica en Áreas Protegidas en elaboración por equipo de trabajo conjunto entre la SER, la UICN y Parques Nacionales de Canadá. Para ello presenta en 9 capítulos la introducción, justificación, el marco normativo, los antecedentes, el diagnóstico, el marco conceptual, los objetivos, las líneas estratégicas de acción, las líneas de gestión y el plan de acción. Este documento cuenta con una guía técnica para la formulación y el abordaje de proyectos de restauración de ecosistemas terrestres y acuáticos presentes y relacionados con las áreas protegidas, así como un protocolo de monitoreo que se presentan como anexos.

Implementing agencies, practitioners, indigenous and local communities, policymakers

Plan Nacional de Restauración Ecológica (2010) Plan de Acción Institucional PAI 2010 - 2014 y al documento CONPES 3680 de 2010 sobre Lineamientos para la Consolidación del Sistema Nacional de Áreas Protegidas.

http://www.globalrestorationnetwork.org/wp-content/uploads/2012/04/Estrategia-Nacional_Colombia.pdf

Protected Areas>USA

Ecosystem Restoration: A Framework for Restoring and Maintaining the National Forests and Grasslands

This Framework offers recommendations to improve the agency's ability to restore ecosystems. These recommendations address 1) adopting a national policy regarding ecosystem restoration, including defining ecosystem restoration as "the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed;" 2) increasing the productivity of the agency's restoration efforts through improved integration of various programs spanning all Deputy areas; 3) effectively applying national, forest, and project planning to engage Forest Service resources, partners, and stakeholders in identifying and implementing restoration needs and priorities; and 4) using budget and performance incentives to increase accomplishment of ecosystem restoration objectives.

Policymakers, implementing agencies

USDA Forest Service (2005)

http://www.fs.fed.us/restoration/documents/RestFramework_final_010606.pdf

Protected Areas>Marine

Guidelines for Marine Protected Areas

These guidelines set out the various actions needed to make an effective MPA, from the early planning stages to implementation. However, they do not deal in detail with every operational aspect of the day-to-day management of MPAs. Nor, for reasons of length, do they provide guidance on integrated coastal management, even though that is the broader context within which MPAs should be managed. We want these guidelines to be useful to natural resource managers at all levels, whether working on conservation of nature or sustainable use of marine resources. They therefore contain material of help to policy-makers, planners and field managers.

Policymakers, implementing agencies

Kelleher, G. (1999) Guidelines for Marine Protected Areas. IUCN, Gland, Switzerland and Cambridge, UK.

http://cmsdata.iucn.org/downloads/mpaguid.pdf

Establishing Marine Protected Area Networks—Making It Happen

This guide helps us to better understand the role of MPAs and MPA networks at local and regional scales to achieve marine conservation. It utilizes current scientific knowledge, institutional experience and global case studies to outline the latest information pertaining to building resilient and functional MPA networks. It also highlights global commitments for marine conservation and shows how to move from individual MPA sites to an effective system of national and regional MPA networks. The design of an MPA network encompasses many considerations, including social, economic, legal and ecological, which collectively contribute to management decisions and implementation. Guidance contained in this document provides MPA practitioners, managers and field staff with techniques for designing effective MPA networks that are resilient to human and environmental threats.

Practitioners

IUCN World Commission on Protected Areas (2008) Establishing Marine Protected Area Networks—Making It Happen. Washington, D.C.: IUCN-WCPA, National Oceanic and Atmospheric Administration and The Nature Conservancy.

http://www.wdpa-marine.org/MPAResources/MPAPlanningResources/Docs/Establishing%20resilient%20MPA%20networks-making%20it%20happen.pdf

Governing Marine Protected Areas - Getting the Balance Right

Rather than exploring this question and the related debates through the literature, this research project aims to explore it through a range of case studies, employing a specifically developed case study research approach – the marine protected area governance (MPAG) framework – to support getting the balance right between the three governance approaches and, ultimately, between the conservation of marine biodiversity and the sustainable use of marine resources. In examining the relative roles of state, market and people-steered approaches, the different case studies examined in this project will explore the proposition that whilst certain approaches are effective at addressing some challenges in some contexts, other sorts of approaches are generally required to address other challenges in other contexts.

Policymakers

Jones, P.J.S., W. Qiu and E.M. De Santo (2011) Governing Marine Protected Areas - Getting the Balance Right. Technical Report, United Nations Environment Programme.

http://www.unep.org/ecosystemmanagement/Portals/7/governing-mpas-final-technical-report-web-res.pdf

Sharing Governance: A Practical Guide for Marine Protected Areas in West Africa

Although the guide is specifically designed for the team that should accompany the setting up of an MPA, it can also be useful to practitioners and administrators (the management team) engaged in the on-going operations of an existing MPA. In fact, even though the structure of the guide is a chronological sequence of the steps to be followed to set up a MPA under a shared governance regime, teams working for MPAs that are already operational may also find information and questions that will enable them to refine their approaches and improve their governance systems.

Policymakers, implementing agencies

Borrini-Feyerabend, G., C. Chatelain and G. Hosch (2011) Sharing governance! A practical guide for marine protected areas in West Africa. PRCM, IUCN and CEESP, Dakar.

http://data.iucn.org/dbtw-wpd/edocs/2010-036-En.pdf

Marine Protected Areas on the High Seas?

The aim of this guide is to facilitate a better understanding of the legal context, relevant international processes, existing approaches and possible solutions to establishing MPAs beyond national jurisdiction. It is not meant to provide authoritative legal advice, but instead to provide an overview of a wide range of issues. Bearing in mind the potentially diverse readership, this guide focuses on the fundamental connexions between legal instruments and institutions, leaving to one side the more complex exceptions and special cases. Every attempt has been made to present issues in objective, accessible and non legalistic prose.

Policymakers

Schwarte, C. and L. Siegele (2008) Marine Protected Areas on the High Seas? Foundation for International Environmental Law and Development (FIELD).

http://www.field.org.uk/files/Marine_protected_areas_screen.pdf

Biophysical Principles for Designing Resilient Networks of Marine Protected Areas to Integrate Fisheries, Biodiversity and Climate Change Objectives in the Coral Triangle

Biophysical principles are presented in this report to help nearshore marine protected area networks achieve fisheries sustainability, biodiversity conservation and ecosystem resilience in the face of climate change. These principles can be considered rules-of-thumb to help guide decision making. In the past, such principles and associated rules-of-thumb have focused on only one or two of these objectives – not all three simultaneously.

Policymakers

Fernandes, L. et al. (2012) Biophysical principles for designing resilient networks of marine protected areas to integrate fisheries, biodiversity and climate change objectives in the Coral Triangle. Prepared by The Nature Conservancy for the Coral Triangle Support Partnership.

http://www.uscti.org/uscti/Resources/MPA%20Network%20Design%20Principles_Executive%20Summary_FINAL_CTSP_Jan_23_2012.pdf

Species Re-Introductions

Guidelines for Re-Introductions

This is a comprehensive set of policy guidelines that ensure that the re-introductions effectively achieve their intended conservation benefit, and do not cause unfavorable environmental side-effects. These guidelines were approved by the 41st Meeting of IUCN Council in May 1995.

Policymakers, implementing agencies, practitioners

English, French, Spanish, German, Japanese, Korean

IUCN (1998) Guidelines for Re-Introductions. Prepared by the IUCN/SSC Re-introduction Specialist Group, IUCN, Gland, Switzerland and Cambridge, UK.

http://www.iucnsscrsg.org/policy_guidelines.html

Guidelines for the Re-introduction of Galliformes for Conservation Purposes

These guidelines provide background information on the aims and objectives of a re-introduction and the issues to consider during the planning phase. The taxonomy, ecology and conservation status of Galliformes is introduced and covers all of the sub-groups: megapodes, cracids, grouse, partridges, quails, francolins, snowcocks, guineafowl and turkeys, and pheasants.

Policymakers, implementing agencies, practitioners

World Pheasant Association and IUCN/SSC Re-introduction Specialist Group (eds.) (2009). Guidelines for the Re-introduction of Galliformes for Conservation Purposes. Gland, Switzerland: IUCN and Newcastle-upon-Tyne, UK: World Pheasant Association.

http://data.iucn.org/dbtw-wpd/edocs/ssc-op-041.pdf

Species Re-Introductions>Africa/Asia

Guidelines for the in situ Re-introduction and Translocation of African and Asian Rhinoceros

These guidelines seek to share and synthesise knowledge and experience of rhino translocations in Africa and Asia, and to provide decision-makers and senior wildlife managers with guidelines on "best practice" for the translocation of African and Asian rhinos.

Policymakers, implementing agencies, practitioners

Emslie R.H., R. Amin and R. Kock (eds.) (2009) Guidelines for the in situ Re-introduction and Translocation of African and Asian Rhinoceros. Gland, Switzerland: IUCN.

http://data.iucn.org/dbtw-wpd/edocs/SSC-OP-039.pdf

Best Practice Guidelines for the Re-Introduction of Great Apes

Specifically designed for rehabilitators and specialists in re-introduction, these guidelines start from the fundamental assumption that re-introductions should not endanger wild populations of great apes or the ecosystems they inhabit. Equally important is the health and welfare of the individual great apes being re-introduced, as well as the caretaker staff and the residents of the surrounding areas. The re-introduction guidelines also require that the factors which first threatened great apes in the proposed site of release have been addressed and resolved.

Policymakers, implementing agencies, practitioners

English, French, Bahasa Indonesia

Beck, B. et al. (2007) Best Practice Guidelines for the Re-Introduction of Great Apes. Gland, Switzerland: SSC Primate Specialist Group of the World Conservation Union.

http://data.iucn.org/dbtw-wpd/edocs/SSC-OP-035.pdf

http://www.primate-sg.org/BP.reintro.htm

Species Re-Introductions>Australia

Guidelines for the Translocation of Threatened Plants in Australia

The Australian Network for Plant Conservation first established guidelines for the translocation of threatened plants for conservation purposes. This second edition puts more emphasis on evaluating whether translocation should go ahead, monitoring and evaluation, and involving local communities. The main points are brought together in useful case studies from across Australia. A new format enhances usability and highlights important information. This publication includes information on: definitions and objectives; deciding whether translocation

is a viable option; the translocation process from project proposal, development, through to monitoring; community participation; and case studies

Practioners, implementing agencies

Vallee, L., T. Hogbin, L. Monks, B. Makinson, M. Matthes and M. Rossetto (2004) Guidelines for the Translocation of Threatened Plants in Australia. Australian Network for Plant Conservation, Canberra.

http://www.anbg.gov.au/anpc/publications/translocation.html

Watersheds

Watersheds>Pacific Islands

Best Practice Guide for Watershed Management in Pacific Islands

This Best Practice Guide for community action and revegetation in Pacific Island hill lands applies Integrated Watershed Management (IWM) principles to promote management practices that reduce accelerated soil erosion, sediment loss and deposition in freshwater and nearshore marine waters and coral reefs. It seeks to support sustainable and productive land use, viable freshwater and marine fisheries, traditional cultural values, biodiversity and associated opportunities such as tourism.

Practitioners, indigenous and local communities

Initiative for the Protection and Management of Coral Reefs in the Pacific (CRISP) (2010) Integrated Coastal Management, COWRIE Project COMPONENT 1A - Project 1A4.

http://www.crisponline.net/Portals/0/New%20reports/ENG%202010%20Best%20practice%20guide%20watershed%20management.pdf

Hawai`i Watershed Guidance

This guidance is intended to help those involved in managing Hawai`i's watersheds develop and implement watershed plans that have the greatest potential for achieving water quality goals. A watershed plan is merely a road map to guide the implementation of practices and activities to achieve results, including the improvement of water quality. Oftentimes, watershed plans include a laundry list of practices that could be implemented in the watershed, without careful consideration for selecting the most appropriate practice for the conditions or implementing the practice in the appropriate geographic area to reduce the pollutant sources. This guidance emphasizes selecting, implementing, and monitoring appropriate management measures to reduce pollutant loads. Watershed management is a collaborative multi-stakeholder process

informed by sound information and data, defined through management measures to achieve goals, and implemented to achieve results.

Implementing agencies, practitioners, indigenous and local communities

Tetra Tech EM, Inc. (2010) Hawai`i Watershed Guidance. Hawai`i Office of Planning, Coastal Zone Management Program.

http://hawaii.gov/dbedt/czm/initiative/nonpoint/HI%20Watershed%20Guidance%20Final.pdf

Watersheds>USA

Watershed Restoration: Principles and Practices

In straightforward, easy-to-understand language, Watershed Restoration: Principles and Practices will give you an in-depth understanding of the principles of watershed restoration, how to build partnerships for a restoration program, practices and strategies for achieving restoration, what works and what doesn't, and what is in store for the future. In addition to providing the scientific, social, and policy frameworks for conducting restoration, the book spotlights how citizen groups, communities, conservation coalitions, private interests, and management agencies are working together to restore watersheds. Case studies address urbanized watershed, farmlands, forestlands, rangelands, and large river systems from New England to California. A critique of these restoration projects summarizes the approaches that offer the best opportunities for long-term success.

Practitioners, implementing agencies, indigenous and local communities

Williams, J.E., C.A. Wood and M.P. Dombeck (eds.) (1997) Watershed Restoration: Principles and Practices. American Fisheries Society, USA.

http://www.afsbooks.org/x55024xm

Handbook for Developing Watershed Plans to Restore and Protect Our Waters

This handbook is intended to help communities, watershed organizations, and state, local, tribal and federal environmental agencies develop and implement watershed plans to meet water quality standards and protect water resources. It was designed to help any organization undertaking a watershed planning effort, and it should be particularly useful to persons working with impaired or threatened waters. EPA intends for this handbook to supplement existing watershed planning guides that have already been developed by agencies, universities, and other nonprofit organizations. The handbook is generally more specific than other guides with respect to guidance on quantifying existing pollutant loads, developing estimates of the load

reductions required to meet water quality standards, developing effective management measures, and tracking progress once the plan is implemented.

Implementing agencies, practitioners

US Environmental Protection Agency (2008) Handbook for Developing Watershed Plans to Restore and Protect Our Waters. EPA 841-B-08-002.

http://water.epa.gov/polwaste/nps/handbook_index.cfm

Watershed Restoration: A Guide for Citizen Involvement in California

This document has been created to guide and support every person in the community, from homemaker to elected official, who wants her or his watershed to provide clean water, harvestable fish resources and other proof that life in the watershed cannot only be maintained but also enjoyed. It is based on years of experience with watershed protection and restoration in California. If citizen involvement is to be effective, it must draw not only on scientific knowledge but also on an understanding of how to translate individual views into commitments and capable group action.

Indigenous and local communities, implementing agencies

Kier, W.M. and Associates (1995) Watershed Restoration--A Guide for Citizen Involvement in California. NOAA Coastal Ocean Program Decision Analysis Series No. 8. NOAA Coastal Ocean Office, Silver Spring.

http://www.cop.noaa.gov/pubs/das/das8.pdf

5. Sector-Specific Guidance and Guidelines

Agriculture/Livestock

Agriculture/Livestock >South Africa

Rehabilitation: A Quick Guide

With the rehabilitation of four study sites, no attempt should be made to try and restore the sites to a pre-settlement condition. The rehabilitation should rather focus on the stabilization of soil erosion, the establishment of a dense and protective plant cover and the introduction of some of the more palatable plant species that were lost due to general habitat degradation.

Practitioners, indigenous and local communities

Coetzee, K. (?) Rehabilitation: A Quick Guide excerpted from Veld Rehabilitation Management Guidelines. Conservation Management Services for the Ostrich Industry Biodiversity Management Project.

http://www.ostrichsa.co.za/downloads/bio_diversity/rehabilitation.pdf

Ecological Best-Practice Livestock Production Guidelines for the Namakwa District

This document comprises two basic parts, an introductory section and the guidelines themselves. The first part of the introduction describes the scope, relationship with other similar guidelines and the methodology employed in the production of the guidelines. The second half of the introduction provides a brief description of the ecological context of the guidelines.

Practitioners, indigenous and local communities

Simon, T., S. Milton, R. Dean, P. Carrick and A. Meyer (2009) Ecological Best-Practice Livestock Production Guidelines for the Namakwa District. Botanical Society of South Africa.

http://www.azef.co.za/pdf/Grazing_Guidelines_Draft.pdf

Guidelines for Managing Wetlands in Forestry Areas

The guidelines given in this document are aimed at supporting Mondi in fulfillment of its policy of minimizing the impact of all forestry and other operations (e.g. burning) on wetlands, by applying best management practices. They also aim to promote and facilitate the sustainable utilization of Mondi's wetlands (e.g. through grazing or craft production from wetland plants).

Implementing agencies, practitioners

Kotze, D.C. (2004) Guidelines for Managing Wetlands in Forestry Areas. Mondi Wetlands Programme.

http://www.wetland.org.za/ckfinder/userfiles/files/3_2-%20Wetland%20management%20guidelines%20for%20forestry.pdf

Agriculture/Livestock>UK

Constructed Farm Wetlands (CFW): Design Manual for Scotland and Northern Ireland

This design manual is intended for use by farm advisers, farmers, consulting engineers, landscape architects, environmental regulators, local authorities and any organisations involved in water quality management in rural areas. The manual provides information and guidance necessary for the design, siting, construction and maintenance of sustainable constructed farm wetlands used to treat lightly contaminated surface water runoff from farm steadings.

Practitioners, implementing agencies, indigenous and local communities

Carty, A., M. Scholz, K. Heal, J. Keohane, E. Dunne, F. Gouriveau and A. Mustafa (2008) Constructed Farm Wetlands (CFW): Design Manual for Scotland and Northern Ireland. Northern Ireland Environment Agency and the Scottish Environment Protection Agency.

http://www.sepa.org.uk/land/idoc.ashx?docid=1830f028-d10c-4a54-9463-bc10e8cb1486&version=-1

Agriculture/Livestock>USA

Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps

The rangeland literature synthesis provides an unprecedented source of evidence-based information to guide the development and assessment of management practices and conservation programs on the nation's rangelands. It assesses the effectiveness of seven NRCS-recommended rangeland conservation practices: Prescribed Grazing, Prescribed Fire, Brush Management, Range Planting, Riparian Management Practices, Wildlife Management Practices, and Invasive Plant Management. Also assessed were two cross-cutting issues: A landscape approach to rangeland conservation, and a social and economic assessment of rangeland conservation practices. Conservation programs that promote adaptive management may more effectively balance variable forage production with livestock demand in addition to investment in infrastructure. Effective management will enhance both production of agricultural goods and provisioning of ecosystem services as outlined by CEAP. Greater development and delivery of management tools and guidelines to support adaptive grazing management will likely optimize

multiple goods and services provided to society and conservation investment in grazed ecosystems.

Policymakers, implementing agencies

Briske, D.D. (ed.) (2011) Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps. United States Department of Agriculture, Natural Resources Conservation Service.

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb1045811

The New Ranch Handbook: A Guide to Restoring Western Rangelands

This book addresses the multitude of contemporary issues facing rangeland management as a profession and ranching as a livelihood. The vision is not just for livestock production but blends environmental concerns with social and cultural values as well. These include new principles in defoliation effects, an increased understanding of fire, and continued theoretical examination of succession, stability, and range condition. Less documented and highly controversial subjects that affect ranching are not overlooked. Included are such concerns as biodiversity, biological crusts, and endangered species. Underlying themes include sustainability and the application of science to management.

Practitioners, indigenous and local communities

Sayre, N.F. (2001) The New Ranch Handbook: A Guide to Restoring Western Rangelands. The Quivira Coalition.

http://quiviracoalition.org/Detailed/Education_...reach/Publications/Books/The_New_Ranch_Handbo..._359.html

Profitable Farms and Woodlands: A Practical Guide in Agroforestry for Landowners, Farmers and Ranchers

This is a practical handbook on agroforestry, in an easy to read format written for underserved and limited resource farmers and woodland owners living in the Southeastern U.S. The handbook is designed to assist farmers and woodland owners establish, manage and market agroforestry projects that are diverse, integrated, profitable, healthy and sustainable. A team of agroforestry experts collaborated to produce this manual. Rigorous and extensive reviews were made for each chapter to ensure the information applies to the targeted audiences and their needs.

Practitioners, indigenous and local communities

Idassi, J.O. (2012) Profitable Farms and Woodlands: A Practical Guide in Agroforestry for Landowners, Farmers and Ranchers. USDA National Agroforestry Center, Lincoln, NE.

http://nac.unl.edu/profitable_farms.pdf

Biodiversity Offsets

Biodiversity Offset Design Handbook

The Principles on Biodiversity Offsets and accompanying supporting materials such as this Biodiversity Offset Design Handbook have been prepared by the Business and Biodiversity Offsets Programme (BBOP) to help developers, conservation groups, communities, governments and financial institutions that wish to consider and develop best practice related to biodiversity offsets.

Implementing agencies, indigenous and local communities

Business and Biodiversity Offsets Programme (2009) Biodiversity Offset Design Handbook. BBOP, Washington, DC.

http://pdf.usaid.gov/pdf_docs/PNADO648.pdf

Biodiversity Offsets - A Briefing Paper for the Mining Industry

In this document, ICMM puts forward a working definition for biodiversity offsets, considers the business case for offsets, highlights issues relating to the design of biodiversity offsets, outlines the parties that have a stake in the decision on offsets, considers the management needs related to offsets, and offers a proposition from ICMM relating to offsets.

Implementing agencies

International Council on Minerals and Metals (2005) Biodiversity Offsets - A Briefing Paper for the Mining Industry. ICMM.

http://www.icmm.com/page/1234/biodiversity-offsets-a-briefing-paper-for-the-mining-industry

Biodiversity Offsets: Views, Experience, and the Business Case

The authors' aim in conducting the interviews with companies, regulators and biodiversity experts that form the basis of this report was to explore the potential and limitations of biodiversity offsets: to consider the concepts involved, such as "net benefit" and "no net loss", as well as why, where, when and by whom biodiversity offsets might be used, and what issues remain to be resolved. In the report, we discuss these issues and draw preliminary conclusions

regarding the potential and limitations of biodiversity offsets, and what steps are needed to develop the approach further.

Policymakers, implementing agencies

ten Kate, K., J. Bishop and R. Bayon (2004) Biodiversity offsets: Views, experience, and the business case. IUCN, Gland, Switzerland and Cambridge, UK and Insight Investment, London, UK.

http://cmsdata.iucn.org/downloads/bdoffsets.pdf

Climate Change

Climate Change>Adaptation

Draft Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design

This document proposes a series of draft principles and guidelines that were produced at a workshop with participation of its authors in June 2011, with the aim to serve as a foundation for planning ecosystem-based approaches to adaptation. The principles are intended to be used by decision makers in national policy in national, territorial and sector planning initiatives, in financial planning, and in project and research design. Hence, the draft set of guidelines is meant to support best-practices for the design and implementation of ecosystem-based approaches to adaptation.

Policymakers, implementing agencies

Andrade, A., R. Córdoba, R. Dave, P. Girot, B. Herrera-F, R. Munroe, J. Oglethorpe, P. Paaby, E. Pramova, E. Watson and W. Vergar (2011) Draft Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design: a discussion document. IUCN- CEM and CATIE, Turrialba, Costa Rica.

http://data.iucn.org/dbtw-wpd/edocs/2011-063.pdf

Review of Existing International and National Guidance on Adaptation to Climate Change: with a Focus on Biodiversity Issues

The purpose of this report is to provide an extensive and systematic review of published international, European and national (EU Member State) guidance on adaptation to climate change, with a focus on biodiversity and its conservation. The findings have been synthesised, key principles identified and the results presented to the Bern Convention's 'Group of Experts on Biodiversity and Climate Change' at their meeting in Strasbourg on 11 September 2008. The

key output of the review is a set of seven overarching adaptation principles for biodiversity and its conservation. These principles are derived from pre-existing guidance, are linked with more detailed measures, and should be considered when developing adaptation strategies and actions to conserve species, habitats and ecosystems and the services that they provide. The concepts underpinning these principles are also equally relevant to other sectors and could be further developed within and across sectors as a standard for universal application.

Policymakers

Harley, M. (2008) Review of Existing International and National Guidance on Adaptation to Climate Change: with a Focus on Biodiversity Issues. Convention on the Conservation of European Wildlife and Natural Habitats, Standing Committee 28th meeting, Strasbourg, 24-27 November 2008.

https://wcd.coe.int/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1296616&SecMode=1&DocId=1430782&Usage=2

Climate Change>Adaptation>USA

Restoring the Great Lakes' Coastal Future: Technical Guidance for the Design and Implementation of Climate-Smart Restoration Projects

The purpose of this guidance is to provide an initial suite of tools and methods to assist in the planning and implementation of climate-smart restoration by the National Oceanic and Atmospheric Administration (NOAA) and its partners and grantees. The guidance is intended to be a living document that evolves in response to workshops, trainings, on-the-ground projects, and other stakeholder input. The body of this guidance is designed to provide an overall framework; more detailed information on conducting a vulnerability assessment and additional resources on restoration, climate change adaptation and the Great Lakes region are provided in appendices. Throughout this guidance, case examples illustrate how to apply this climate-smart restoration framework to the actual practice of restoration.

Policymakers, implementing agencies, practitioners

Glick, P., J. Hoffman, M. Koslow, A. Kane and D. Inkley (2011) Restoring the Great Lakes' Coastal Future: Technical Guidance for the Design and Implementation of Climate-Smart Restoration Projects. National Wildlife Federation, Ann Arbor.

http://www.habitat.noaa.gov/pdf/final_restoring_the_great_lakes_coastal_future_2011.pdf

Climate Change>Mitigation

Guidebook for the Formulation of Afforestation/Reforestation and Bioenergy Projects in the Regulatory Carbon Market

The purpose of this guidebook is to serve as guidance for those interested in developing land-use change, forestry and bio-energy projects under the Clean Development Mechanism (CDM) of the Kyoto Protocol. The guidebook has been updated by Winrock International with the support of UNEP's CASCADe programme, modified from an earlier version of an ITTO publication (TS 25 / 2006). This updated version includes new information on bio-energy projects and an Annex on voluntary carbon markets.

Policymakers

English, French

Pearson, T.R.H., S. Walker, J. Chalmers, E. Swails and S. Brown (2009) Guidebook For The Formulation Of Afforestation/Reforestation And Bioenergy Projects In The Regulatory Carbon Market. Winrock International.

http://www.itto.int/technical_report/?pageID=1

Guidebook for the Formulation of Afforestation and Reforestation Projects under the Clean Development Mechanism

The CDM project cycle is very demanding on project developers, involving project design and development, validation, registration, monitoring, verification and certification. This publication describes the conceptual and procedural details for formulating afforestation and reforestation projects under the CDM with an introduction to the Kyoto Protocol and the CDM.

Policymakers

English, French

Pearson, T., S. Walker and S. Brown (2006) Guidebook for the Formulation of Afforestation and Reforestation Projects under the Clean Development Mechanism. ITTO Technical Series 25.

http://www.itto.int/technical_report/?pageID=1

Ecosystem Services

An Introductory Guide to Valuing Ecosystem Services

This Introductory Guide looks at how the framework for the valuation of the natural environment could be improved by offering a comprehensive and systematic means to ensuring

that ecosystems and the services they provide are taken into account in policy appraisal. It builds on traditional valuation approaches by explicitly considering the environment as a whole – bringing together land, water, air, soil and biodiversity – and recognising that their linkages provide a wide variety of services and benefits that are not specific to any one part. The approach stresses that changing any one part of our environment can have consequences, both positive and negative, and often unintended for the ecosystem as a whole.

Policymakers

UK Department for Environment, Food and Rural Affairs (2007) An Introductory Guide to Valuing Ecosystem Services. DEFRA, UK.

http://archive.defra.gov.uk/environment/policy/natural-environ/documents/eco-valuing.pdf

Restoring Nature's Capital: An Action Agenda to Sustain Ecosystem Services

The authors contend that governance—who makes decisions, how they are made, and with what information—is at the heart of sustaining healthy ecosystems. With this as their fundamental tenet, the authors present an action agenda for reversing degradation of ecosystems and sustaining their capacity to provide vital services for generations to come. The action agenda identifies how decisions about development projects and investments can be made in ways that lead to healthy ecosystem services. These decisions, made by local and national governments, corporations, and international financial institutions, involve billions of dollars, affect huge swaths of land and water, and affect millions of people.

Policymakers

Irwin, F. and J. Ranganathan (2007) Restoring Nature's Capital: An Action Agenda to Sustain Ecosystem Services. World Resources Institute, Washington, DC.

http://pdf.wri.org/restoring_natures_capital.pdf

Ecosystem Services: A Guide for Decision Makers

By offering decision makers the conceptual and practical guidance for choosing policies that better attend to ecosystem services, this guide aims to help unite nature and development. Instead of solely working to protect nature from development, we may also begin to invest in nature for development.

Policymakers

English, French, Hebrew

Ranganathan, J., K. Bennett, C. Raudsepp-Hearne, N. Lucas, F. Irwin, M. Zurek, N. Ash and P. West (2008) Ecosystem Services: A Guide for Decision Makers. World Resources Institute, Washington, DC.

http://www.wri.org/publication/ecosystem-services-a-guide-for-decision-makers

Extractive Industries

Guidelines on Quarry Rehabilitation: Biodiversity and Land Stewardship

The guidelines contain a clear set of recommendations for the development and implementation of a quarry rehabilitation plan. The objectives of the CSI in developing these recommendations are: 1) Support the process of quarry rehabilitation across member companies, and by doing so, improve the standard of rehabilitation projects for existing and new sites and 2) Ensure that CSI members have a common understanding of the CSI KPIs on quarry rehabilitation, and that reporting against these KPIs is consistent across members.

Implementing agencies

World Business Council for Sustainable Development (2011) Guidelines on Quarry Rehabilitation: Biodiversity and Land Stewardship. WBCSD, Geneva.

http://wbcsdcement.org/pdf/CSI%20Guidelines%20on%20Quarry%20Rehabilitation%20(English)_Dec%202011.pdf

Good Practice Guidance for Mining and Biodiversity

Despite the significant potential for negative impacts on biodiversity from mining operations, there is a great deal that companies can do to minimize or prevent such impacts in areas identified as being appropriate for mining. There are also many opportunities for companies to enhance biodiversity conservation within their areas of operations. Being proactive in the assessment and management of biodiversity is important not only for new operations but also for those that have been operating for many years, usually under regulatory requirements that were less focused on the protection and enhancement of biodiversity.

Implementing agencies, policymakers

International Council on Mining and Minerals (2006) Good Practice Guidance for Mining and Biodiversity. ICMM, London.

http://www.icmm.com/page/1182/good-practice-guidance-for-mining-and-biodiversity

Mining and Biodiversity: Towards Best Practice

The workshop focused on seeking participants' views and inputs on various activities of the IUCN ICMM Dialogue as well as other parallel projects now underway by other organisations. It also advanced the development of best practice guidance and reporting criteria in the area of biodiversity assessment and management. Accordingly, the workshop was divided into two parts: Strategic Overview and Best Practice Guidance and Recommendations.

Implementing agencies

Summary and discussion of the results of the IUCN-ICMM workshop on Mining, Protected Areas and Biodiversity Conservation: Searching and Pursuing Best Practice and Reporting in the Mining Industry 7-9 July, 2003.

http://www.forest-trends.org/documents/files/doc_663.pdf

Environmental Guidelines for Mining Operations

These guidelines present recent examples of sound environmental management practices and regulations from various mining countries worldwide and are designed to assist government and industry, from both developing and developed countries, encourage sustainable mining practices. They encompass a variety of tools and systems, including environmental impact assessment (EIAs), environmental management systems and programmes, environmental monitoring programmes, environmental auditing and enforcement. The material presented in these Guidelines consists of recent examples of environmental management practices and regulations from various mining countries around the world.

Implementing agencies, policymakers

UNEP (1998) Environmental Guidelines for Mining Operations. United Nations Department of Economic and Social Affairs (UNDESA).

http://commdev.org/environmental-guidelines-mining-operations

Ecosystem Services Guidance: Biodiversity and Ecosystem Services Guide and Checklists

The aim of this guide is threefold. Firstly, it explains the relationship between biodiversity, ecosystem services and the oil and gas industry. Secondly, it provides a set of checklists to help identify the main ecosystem service dependencies and impacts of oil and gas developments. Thirdly, it highlights key associated risks and opportunities for oil and gas companies, and provides guidance on potential measures for managing them.

Implementing agencies

International Association of Oil & Gas Producers (2011) Ecosystem Services Guidance: Biodiversity and ecosystem services guide and checklists. OGP Report Number 461.

http://www.ipieca.org/sites/default/files/publications/ecosystem_services_guidance_8.pdf

Extractive Industries>Australia

Mine Rehabilitation

This handbook outlines the principles and leading practices of mine rehabilitation, with emphasis on land form design and revegetation. It shows readers how to use current and emerging technologies and practices more efficiently. The principles described should apply to any land disturbed by mining. Following the operational sequence in mining operations such as consultation, planning, operations and completion, each chapter focuses on the processes and issues relevant to the site over its life span. Particular emphasis is given to the restoration of natural ecosystems, especially the re-establishment of native flora.

Implementing agencies

Leading Practice Sustainable Development Program for the Mining Industry (2006) Mine Rehabilitation. Australian Government, Minister for Industry, Tourism and Resources.

http://www.dmp.wa.gov.au/documents/mine_rehab.pdf

Extractive Industries>Canada

Best Practice Guidelines for Aggregate Rehabilitation Projects: Extracting the Benefits for Species at Risk and Rare Habitats

This report offers a series of best restoration and management practices for rehabilitating former aggregate sites to achieve the goal of maximizing the biodiversity value (including species at risk) while minimizing maintenance costs. The recommendations are outlined within the context of the latest developments in recovery planning and implementation for species at risk, best management practices and ideas that the industry or its related clients may be able to follow or to build upon.

Implementing agencies

The Ontario Aggregate Resources Corporation (2008) Best Practice Guidelines for Aggregate Rehabilitation Projects: Extracting the Benefits for Species at Risk and Rare Habitats.

http://www.toarc.com/pdfs/Toarc_Best_Practices.pdf

Extractive Industries>Spain/Portugal

Manual para la Restauración de Canteras de Roca Caliza en Clima Mediterráneo

El presente documento reúne la experiencia de los autores a lo largo de los últimos 20 años de trayectoria en este tema, a través de diferentes proyectos patrocinados por las empresas del sector, por las administraciones autonómicas, por planes nacionales de y por la Unión Europea (Ecoquarry LIFE04-ENV00195). El deseo de los autores es que este Manual sea un documento de trabajo útil para los responsables de la restauración de las explotaciones y que ayude a mejorar los resultados de los proyectos de recuperación de canteras.

Practitioners, implementing agencies

Jorba, M., G. Oliveira, R. Josa, V.R. Vallejo, J.M. Alcañiz, A. Hereter, J. Cortina, O. Correia and J.M. Ninot (2010) Manual para la restauración de canteras de roca caliza en clima mediterráneo. Departamento de Medio Ambiente y Vivienda de la Dirección General de Calidad Ambiental de la Generalitat de Catalunya, Spain.

http://cba.fc.ul.pt/about/news/Guia_canteras.pdf

Extractive Industries>UK

Sustainable Aggregates Information Gateway

There have been significant improvements in the environmental performance of the aggregate industry in recent years, nevertheless ensuring sustainable aggregates production in the longer term will require continued improvement. In the last two years of the Aggregates Levy Sustainability Fund, the Strategic Research Programme gave an opportunity to investigate some issues and innovations, which may help to make further significant improvements. The aim of the programme was to provide an enhanced evidence base for the policymakers, industry and others whose decisions will shape the future of the aggregates production.

Policymakers, implementing agencies

Aggregates Levy Sustainability Fund UK

http://www.sustainableaggregates.com/strategic/introduction.htm

Extractive Industries>Drylands

Extractive Industries in Arid and Semi-Arid Zones: Environmental Planning and Management

This publication aims to contribute to planning and management approaches that minimise land degradation and desertification in arid and semi-arid zones as a result of extractive industries operations. It is primarily intended to help those government departments responsible for the licensing, planning and monitoring of extractive industries activities to take account of environment and development issues in their decision-making. In addition, the document offers environmental planning and management fundamentals for extractive industries, local non-governmental organisations, and academic institutions.

Policymakers

English, French, Spanish

Gratzfeld, J. (ed.) (2003) Extractive Industries in Arid and Semi-Arid Zones: Environmental Planning and Management. IUCN, Gland, Switzerland and Cambridge, UK.

http://iucn.org/about/union/commissions/cem/cem_resources/cem_ems/

Fisheries

The Ecosystem Approach to Fisheries: Issues, Terminology, Principles, Institutional Foundations, Implementation and Outlook

One major difficulty in defining EAF lies precisely in turning the available concepts and principles into operational objectives from which an EAF management plan would more easily be developed. The paper discusses these together with the types of action needed to achieve them. Experience in EAF implementation is still limited but some issues are already apparent, e.g. in added complexity, insufficient capacity, slow implementation, need for a pragmatic approach, etc. It is argued, in conclusion, that the future of EAF and fisheries depends on the way in which the two fundamental concepts of fisheries management and ecosystem management, and their respective stakeholders, will join efforts or collide.

Policymakers, implementing agencies

Garcia, S.M., A. Zerbi, C. Aliaume, T. Do Chi and G. Lasserre (2003) The ecosystem approach to fisheries: Issues, terminology, principles, institutional foundations, implementation and outlook. FAO Fisheries Technical Paper No. 443, Rome.

ftp://ftp.fao.org/docrep/fao/006/y4773e/y4773e00.pdf

Fisheries>Inland Waters

Habitat Rehabilitation for Inland Fisheries: Global Review of Effectiveness and Guidance for Rehabilitation of Freshwater Ecosystems

This review provides a synthesis of information on the effectiveness of habitat rehabilitation for inland fisheries as well as recommendations for implementing, monitoring and evaluating habitat rehabilitation activities. The document is intended to assist managers, practitioners and scientists involved in the restoration of aquatic ecosystems. It draws on the more than 50 years of practical experience of the authors in the field of fisheries and riparian ecology, aquaculture and habitat restoration.

Practitioners, implementing agencies

Roni, P., K. Hanson, T. Beechie, G. Pess, M. Pollock and D.M. Bartley (2005) Habitat rehabilitation for inland fisheries. Global review of effectiveness and guidance for rehabilitation of freshwater ecosystems. FAO Fisheries Technical Paper. No. 484. Rome, FAO.

ftp://ftp.fao.org/docrep/fao/008/a0039e/a0039e00.pdf

Fisheries> Inland Waters >Canada

Fish Habitat Rehabilitation Procedures

Most of the procedures in this guide are focused on the short term (20-50 years). For the long term, riparian protection and restoration needs to be implemented and maintained to recover riparian functions, to provide future desired conditions for fish and wildlife resources and to provide shrubs and deciduous trees for leaf litter mixed with mature coniferous trees for large wood recruitment and fluvial-resistive root systems. Finally, although practitioners of restoration have little control over fish harvest rates or ocean (or lake) conditions that cause shifts in migrant survivals, it is assumed that wise stock management in the fishery will ensure sufficient spawning escapements to these streams.

Practitioners, implementing agencies

Slaney, P.A. and D. Zaldokas (eds.) (1997) Fish Habitat Rehabilitation Procedures. BC Ministry of Environment, Lands and Parks, Watershed Restoration Technical Circular No. 9.

http://www.env.gov.bc.ca/wld/documents/wrp/wrtc_9.pdf

Indigenous and Local Communities

Sharing Power: Learning by Doing in Co-management of Natural Resources throughout the World

For practitioners in search of an open and flexible guide to co-management practice on the basis of lessons learned in a variety of socio-ecological settings, this volume simply has no equal. The “phases” of the process - organising, negotiating, implementing agreements and

learning by doing - as well as the agreements and organisations they usually end up developing, are described and appreciated through a wealth of examples, tools and sound advice.

Practitioners, policymakers

Borrini-Feyerabend, G., M. Pimbert, M. T. Farvar, A. Kothari and Y. Renard (2004) Sharing Power. Learning by doing in co-management of natural resources throughout the world, IIED and IUCN/ CEESP/ CMWG, Cenesta, Tehran.

http://www.iucn.org/about/union/commissions/ceesp/ceesp_publications/sharing_power.cfm

Broadening Participation in Biological Monitoring: Guidelines for Scientists and Managers

This set of guidelines is written for managers and scientists in the United States who are contemplating a participatory approach to monitoring biological resources, especially biodiversity. It is designed as a how to manual with discussions of relevant topics, checklists of important considerations to address, resources for further information, and worksheets for developing, implementing, and evaluating a monitoring plan. The subject matter is divided into 3 stages of a monitoring project encompassing a total of 22 topical modules.

Implementing agencies, practitioners

Pilz, D., H.L. Ballard and E.T. Jones (2005) Broadening participation in biological monitoring: guidelines for scientists and managers. Portland, OR: Institute for Culture and Ecology.

http://www.ifcae.org/projects/ncssf3/IFCAE-ParticipatoryMonitoringGuidelines-2005.pdf

Akwé: Kon

The Voluntary Guidelines were named by a Mohawk term meaning "everything in creation", so as to emphasize the holistic nature of this instrument. Indeed, the guidelines are intended to provide a collaborative framework ensuring the full involvement of indigenous and local communities in the assessment of cultural, environmental and social concerns and interests of indigenous and local communities of proposed developments. Moreover, guidance is provided on how to take into account traditional knowledge, innovations and practices as part of the impact-assessment processes and promote the use of appropriate technologies.

Policymakers, implementing agencies, indigenous and local communities

Secretariat of the Convention on Biological Diversity (2004) Akwé: Kon - Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessment regarding Developments Proposed to Take Place on, or which are Likely to Impact on, Sacred Sites and on

Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities. CBD Guidelines Series, Montreal.

http://www.cbd.int/doc/publications/akwe-brochure-en.pdf

IUCN CEESP Briefing Notes

Recognising and Supporting Indigenous & Community Conservation: Ideas and experience from the grassroots (Briefing Note No. 9)

Strengthening What Works: Recognising and supporting the conservation achievements of indigenous and local communities (Briefing Note No. 10)

Bio-cultural diversity conserved by indigenous peoples & local communities: Examples & analysis (Companion document to Briefing Note No. 10)

English, French, Spanish

http://www.iccaforum.org/index.php?option=com_content&view=article&id=89&Itemid=105

Indigenous and Local Communities>Coastal Zones

Digging In: A Guide to Community-based Habitat Restoration

The purpose of this guide is to assist inspired individuals and organizations in undertaking community-based habitat restoration projects, and to help maximize the success of these projects. The guide is designed for people who seek to develop new programs, but may also be helpful in expanding or improving an existing program. The guide explains, in easy-to-follow instructions, the basic steps of information gathering, site selection, team building, project implementation, monitoring, maintenance, and working with volunteers. Also included are tips on battling non-natives, as well as propagating and installing native plants. While this guide is focused on the Commission's experiences in marshes, creeks, and coastal sage scrub communities, we reference several other coastal habitat types as well.

Indigenous and local communities

California Coastal Commission (2008) Digging in: A guide to community-based habitat restoration. CCC, San Francisco.

http://www.coastal.ca.gov/publiced/UNBweb/diggingin.pdf

Community-based Dune Management for the Mitigation of Coastal Hazards and Climate Change Effects: A Guide for Local Authorities

The primary purpose of this report is to bring together lessons from existing and successful dune care/restoration programmes in New Zealand to provide guidelines for councils wanting to initiate dune restoration programmes - both to mitigate coastal hazards, including climate chnage effects such as projected sea level rise, and to restore the beneficial natural and human use values associated with coastal dunes. A second aim is to encourage councils to adopt community-based partnerships for successful dune restoration programmes and to provide best-practice models for easy adoption. The case studies later in the report provide examples of existing community level projects partnered and supported by councils.

Implementing agencies, indigenous and local communities

Dahm, J., G. Jenks and D. Bergin (2005) Community-based Dune Management for the Mitigation of Coastal Hazards and Climate Change Effects: A Guide for Local Authorities. Bay of Plenty Regional Council, New Zealand.

http://www.boprc.govt.nz/media/32260/ClimateChange-0505-CoastalhazardsandclimateReport.pdf

Community-Based Eelgrass Restoration Manual

The Community-Based Eelgrass Restoration Manual brings the reader through all necessary stages to complete an eelgrass restoration project that involves volunteer participation. In this manual, we briefly introduce eelgrass, discuss its ecology, plant characteristics, and value to the coastal ecosystem. We explain how to select transplant site; site selection is critical to long-term transplant success. We discuss necessary permits and equipment needed to complete a restoration project. We explain the methodology used to harvest the eelgrass from an appropriate donor site and to transplant the eelgrass shoots using the TERFS (Transplanting Eelgrass Remotely with Frame Systems) method. We discuss the logistics of organizing an eelgrass transplanting project using volunteers from the community. Finally, we explain how to monitor the eelgrass transplants and determine the success of the project.

Indigenous and local communities, implementing agencies, practitioners

Short, F.T., C.A. Short and C.L. Burdick-Whitney (2002) Community-Based Eelgrass Restoration Manual. Jackson Estuarine Laboratory, University of New Hampshire.

http://marine.unh.edu/jel/seagrass_ecology/communityeelgrassrestoration/commeelgrassrestor2002.pdf

A Guide to Community-Based Mangrove Reforestation and Management in WIO

The current Guide targets communities involved in mangrove reforestation and management in the WIO region. The Guide provides background information on the nature of mangrove ecosystem, its attributes as well as the major problems affecting the mangroves – both human and natural pressure. Using long term experience in mangrove reforestation works at Gazi, the Guide analyses challenges facing community based mangrove reforestation projects; and provide possible solutions to these projects.

Indigenous and local communities

Kairo, J.G. (2010) A Guide to Community-Based Mangrove Reforestation and Management in WIO. Consultancy Report II, Identification No. PE3.

http://recomap-io.org/uploads/media/Guide_Community_based_mangrove_reforestation_Mgt_WIO.pdf

Indigenous and Local Communities>Drylands

Gender and Desertification: Expanding Roles for Women to Restore Dryland Areas

This review examines the impact of desertification on women, their role in the management of natural resources and drylands, and the constraints they face. It presents the experiences of several IFAD supported programmes and projects in addressing women as natural resource users and managers in dryland areas, and highlights some of the approaches used to reach women more effectively. It also presents lessons learned from IFAD programmes and projects, and recommendations for expanding women's roles in order to restore dryland areas.

Policymakers

International Fund for Agricultural Development (2010) Gender and Desertification: Expanding Roles for Women to Restore Dryland Areas. IFAD, Rome.

http://www.ifad.org/pub/gender/desert/gender_desert.pdf

Generic Guidelines for Mainstreaming Drylands Issues into National Development Frameworks

The guidelines have been informed by lessons drawn from 21 countries on mainstreaming environment into development frameworks with a particular focus on drylands issues, and by a review made of other international organizations' guidelines on the same subject.

Policymakers

UNDP (2008) Generic Guidelines for Mainstreaming Drylands Issues into National Development Frameworks.

http://www.undp.org/environment/docs/slm/GUIDE%20english%20final.pdf

Indigenous and Local Communities>Protected Areas

Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation

These Guidelines explore protected area approaches and models that see conservation as fully compatible with human communities – as managers, decision-makers, residents, users, caretaking neighbours – and that regard such communities as an asset to conservation rather than a liability. Drawing on recent experience and best practice from around the world, as well as from reflections and guidance developed at the local, national, regional and international levels, these Guidelines offer considerations, concepts and ideas. They do not prescribe blue print solutions, but offer a menu of options for action, to be reviewed by the concerned actors and adapted to their circumstances.

Indigenous and local communities

Borrini-Feyerabend, G., A. Kothari and G. Oviedo (2004) Indigenous and Local Communities and Protected Areas: Towards Equity and Enhanced Conservation. IUCN, Gland, Switzerland and Cambridge, UK.

http://cmsdata.iucn.org/downloads/pag_011.pdf

Recreation/Tourism

Wetlands, Poverty Reduction and Sustainable Tourism Development

Coasts, lakes, rivers, mangroves and other wetland areas are an important resource for tourism. Tourists enjoy swimming and diving, watching birds and other wildlife or just enjoying the scenery. Less is known about the extent to which tourism in these wetlands contributes to poverty reduction in developing countries. The relationship between tourism and wetlands is however complex and sometimes adversarial. Tourism can impact wetlands in a number of ways such as by causing habitat loss, pollution, noise or over-consumption of water. But with proper planning tourism can also be an innovative mechanism for funding nature conservation and development of local livelihoods.

Policymakers, implementing agencies

English

Van der Duim, R. and R. Henkens (2007) Wetlands, Poverty Reduction and Sustainable Tourism Development. Wetlands International, IUCN Netherlands Committee, Cordaid, TUI Nederland, the Secretariat of the Ramsar Convention and the Tourism & Environment Group of the Wageningen University and Research Centre (TE-WUR).

http://www.wetlands.org/WatchRead/Currentpublications/tabid/56/mod/1570/articleType/ArticleView/articleId/1640/Default.aspx

Soils/Contaminated Lands

Soils/Contaminated Lands>Europe

Guidance on Understanding and Managing Soils for Habitat Restoration Projects

The key message in terms of managing soil for habitat restoration projects is to try and work with existing conditions before altering the site. This will minimise the initial and long-term costs involved. Such restoration, if it is to be successful, requires a full understanding of the physical and chemical properties of the soil, along with its plant, animal and microbial communities – collectively known as the soil ecosystem. There is a complex set of interrelationships between living and non-living components, driving the structure and function of soil ecosystems. The process of soil formation is never ending; there will always be a dynamic interaction between water, air, biology and minerals. Materials, whether solid or in solution, arriving from elsewhere, will continue to drive and shape the changing nature of the soil.

Practitioners, implementing agencies

Bradley, I. et al. (2006) Guidance on understanding and managing soils for habitat restoration projects. English Nature Research Report No 721, Sheffield.

http://publications.naturalengland.org.uk/publication/61016

Using Organic Wastes and Composts to Remediate and Restore Land: Best Practice Manual

This Manual of Best Practice provides a comprehensive framework and detailed description of the ways in which composts created from bulk organic materials may be used alone or mixed with mineral wastes for the restoration of a wide range of derelict land sites to create green landscapes which encompass newly created habitats of conservation value. The manual carefully explains every step in the process, starting with the legal and regulatory framework, via the various methods of producing compost, establishing a compost site and using the

product for creation of habitats for conservation and biodiversity and the remediation of contaminated sites.

Implementing agencies

Nason, M., J. Williamson, S. Tandy, M. Christou, D. Jones and J. Healey (2007) Using organic wastes and composts to remediate and restore land: best practice manual. School of the Environment and Natural Resources, Bangor University.

http://ies.bangor.ac.uk/TWIRLS/Web%20version%20Manual.pdf

Transport

Ecological and Engineering Guidelines for Wetlands Restoration in Relation to the Development, Operation and Maintenance of Navigation Infrastructures

This report outlines the ecological engineering aspects of restoring wetlands functions within the ecosystem, including: evaluation, goals, communication, design, environment, social use, public use, economy, regulations, engineering, implementation, monitoring, and landscape consideration. Case studies are presented in terms of wetland type, problem identification, solutions and measures, and lessons learned. Some of the case studies deal specifically with modeling related to wetland restoration, with indications of models used and their advantages/disadvantages.

Implementing agencies, practitioners

EnviCom Working Group 07 (2003) Ecological and Engineering Guidelines for Wetlands Restoration in Relation to the Development, Operation and Maintenance of Navigation Infrastructures. The World Association for Waterborne Transport Infrastructure, Brussels.

http://www.pianc.org/edits/articleshop.php?id=4000071

http://www.terra-et-aqua.com/dmdocuments/terra-et-aqua_nr97_07.pdf

Transport>Europe

Code of Practices for the Introduction of Biological and Landscape Diversity Considerations into the Transport Sector

The Code of Practice for the Introduction of Biological and Landscape Diversity Considerations into the Transport Sector provides a practical instrument that will help national governments and others involved in the linear transport sector to consider and implement measures relating to the maintenance and enhancement of biological and landscape diversity. The Code sets a

political and social framework and proposes policy options for the development of new, and the maintenance of existing linear transport systems in relation to biological and landscape diversity. By building on examples, the Code has developed a series of Practice Pointers.

Policymakers

English, French

Council of Europe (2003) Code of practices for the introduction of biological and landscape diversity considerations into the transport sector. Nature and Environment Series No. 131, Strasbourg.

http://book.coe.int/EN/ficheouvrage.php?PAGEID=36&=EN&produit_aliasid=1119

Transport>USA

Road Management in the Context of Watershed Restoration

This paper addresses forest road management within the context of forested watershed restoration, highlighting many of the concerns stemming from roads and outlining goal-setting, prioritization, and techniques for road management that can improve watershed condition. While roads can also have impacts in other types of systems (i.e., non-forested) and from other resource extraction practices (e.g., mining), it is beyond the scope of this paper to address all of these.

Davis, L.R. (ed.) (2010) Road Management in the Context of Watershed Restoration. Pacific Northwest Forest Restoration Learning Network Technical Paper No. 2.

http://waconservation.org/dl/dl_ellsworthRoadManagforWaterRest_WhitePaper2010.pdf

Management and Techniques for Riparian Restorations: Roads Field Guide, Volume I & 2

Restoration techniques can be used to protect riparian areas during new road construction, or to restore riparian areas impacted by existing roads. Some techniques are valid to only one or two ecoregions, but others are applicable nationwide. Techniques may be used singly, or in concert with other techniques, depending on the road problem and the riparian objectives. This field guide presents information in a practical, user friendly format to help resource managers and professionals.

Practitioners, implementing agencies

Adair, S. et al. (2002) Management and Techniques for Riparian Restorations: Roads Field Guide, Volume I & 2. United States Department of Agriculture Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-102, Vol 1 & 2.

http://www.fs.fed.us/rm/pubs/rmrs_gtr102_1.pdf

http://www.fs.fed.us/rm/pubs/rmrs_gtr102_2.pdf

Urban Areas

Green, Clean, and Dollar Smart: Ecosystem Restoration in Cities and Countryside

This guidebook offers cities, counties, states, and stakeholders some discussion, examples, and a summary of tools and policy recommendations that may stimulate further interest in expanding, integrating, and refining the greening of urban infrastructure using an ecosystem services framework.

Policymakers, indigenous and local communities

Scarlett, L. 2012. Green, Clean, and Dollar Smart: Ecosystem Restoration in Cities and Countryside. Environmental Defense Fund, Washington, DC.

http://lynnscarlett.com/uploads/2/7/9/5/2795360/10811_green_clean_and_dollar_smart.pdf

Urban Areas>Forests/Woodlands

Green Seattle Forest Steward Field Guide

The Forest Steward Field Guide in your hands contains the basic yet essential information you will need to develop and implement site restoration plans and a system for tracking progress. As a forest steward, you will have opportunities to expand your forest restoration knowledge and skills by attending specialized training sessions in restoration practices, volunteer management, monitoring, and more. In addition, Forest Stewards at each park are eligible to receive materials, plants, and crew assistance for your restoration projects through the Green Seattle Partnership.

Indigenous and local communities, practitioners, implementing agencies

Green Seattle Partnership (2011)

http://greenseattle.org/forest-steward-resources-1/new-forest-steward-field-guide-2011-1

Green Seattle Monitoring Data Collection Methods

In order to collect information about the site, a permanent 1/10 th acre plot should be established on a representative area of your restoration site. Ideally, a plot will be established before any restoration activities are initiated. This will allow baseline data to be collected and used to create the restoration plan. The monitoring methods presented in this guide will enable you to collect information about the following categories: 1) Site characteristics inventory, 2) Percent cover of vegetation, and 3) Tree density.

Indigenous and local communities, practitioners, implementing agencies

Green Seattle Partnership (2010)

http://greenseattle.org/forest-steward-resources-1/monitoring/draft-monitoring-protocols/at_download/file

Urban Areas> Inland Waters>Asia-Pacific

Draft Guidelines for Sustainable Rehabilitation of Small Urban Water Bodies

These guidelines are meant to provide for interested individuals, local initiatives, planers, decision makers on a district and town level as well as NGO's the proper background to start a small scale urban water body rehabilitation project to create an ECO-DISTRICT within a City. This publication provides principles to guide initiatives from the stage of a sparking idea to the process to decide which water body has currently a chance for rehabilitation and where more effort is needed to improve the basis and background for a rehabilitation project. The quality of the water body is essential; therefore decentralized treatment of wastewater which enters the river or lake becomes one of the major starting point to create a ecologically sustainable environment.

Policymakers, implementing agencies

United Nations (2010) Draft Guidelines for Sustainable Rehabilitation of Small Urban Water Bodies. Discussion Paper on the Wastewater Revolution in Asia Pacific to achieve the MDG target on Sanitation.

http://www.ecowaterinfra.org/activities/documents/Research%20and%20Analysis/Urban%20Watercourse%20Rehabilitation%20-%20Draft.pdf

Urban Areas> Inland Waters>Europe

Urban River Basin Enhancement Methods

A comprehensive understanding of urban river rehabilitation and design is the objective of the research project “Urban River Basin Enhancement Methods” (URBEM; cf. Bettess et al., in prep.) funded by the European Commission under the 5th Framework Programme, Key Action 4 “City of tomorrow and cultural heritage“. It includes an investigation on the current state of urban river enhancement as well as the development of new tools, innovative techniques and improved procedures to enhance water courses in urban areas. These tools should provide planning assistance for the differing, multi-functional uses of urban water courses and their adjacent communities across Europe. They are aimed at assisting decision makers in sustainable management of urban rivers. Altogether, the URBEM research project builds up a comprehensive framework to facilitate urban water course rehabilitation and enhancement in Europe. Based on this it includes training and briefing modules, to the public, professionals and environment authorities.

Policymakers, implementing agencies

Schanze, J., A. Olfert, J.T. Tourbier, I. Gersdorf and T. Schwager (2004) Urban River Basin Enhancement Methods. European Commission 5th Framework Programme, Key Action 4 “City of tomorrow and cultural heritage“.

http://www.urbem.net/WP2/WP2_case_studies.pdf

Urban Areas>Inland Waters>Rivers

Manual of Urban Rivers Rehabilitation Techniques

This manual consist of selected technical measures for urban stream rehabilitation measures, which can be become a component of urban river enhancement projects, dealing with river channels, banks as well riparian areas. Techniques presented can be integrated into urban settings to prevent or reduce problems affecting water resources. Techniques presented here improve the hydro-morphological condition of rivers and the runoff that drains into them. Urban runoff control, also called “sustainable urban drainage” is being seen as a component of urban river basin enhancement. Techniques are divided into groups related to certain aspects, such as control of the amount and quality of runoff, or channel rehabilitation. Fact sheets contain construction guidelines, maintenance aspects, advantages, disadvantages, an illustration sketch, photos and references and suggested reading. For each technique individually covered are description, application, advantages and disadvantages, maintenance. They are designed to provide an overview for professionals, decision makers, non-governmental organizations and the general public.

Policymakers, implementing agencies, practitioners

Tourbier, J.T. and R.N. Westmacott (2005) Manual of Urban Rivers Rehabilitation Techniques. Urban River Basin Enhancement Methods, A Contribution to Work Package 8, Chapter 5.

http://www.urbem.net/WP8/Doc8_1_C.pdf

Urban Areas>Watersheds

Urban Subwatershed Restoration Manual Series

Under an EPA grant, the Center developed from 2003 to 2008 an eleven-manual series on practical techniques to restore urban watersheds. The manuals cover the seven major practices used to restore urban watersheds: stormwater retrofits, stream repair, riparian management, discharge prevention, pollution source controls, watershed forestry and municipal operations. In addition, the series outlines new methods for desktop and field assessment and stakeholder management to develop effective small watershed restoration plans, and presents an integrated framework for urban watershed restoration.

Practitioners, indigenous and local communities

Center for Watershed Protection, USA.

http://www.cwp.org/categoryblog/92-urban-subwatershed-restoration-manual-series.html

Annex 1. Gap Analysis

With regard to general guidance and guidelines, and in view of the wide range of activities in the science and practice of ecological restoration, there do not appear to be any significant gaps in this set of resources. These guidance documents generally follow the unifying concepts of ecology and ecosystem management and many explicitly refer to, or build upon, the definitions, attributes, and principles set forth in the Society for Ecological Restoration (SER) *Primer on Ecological Restoration* (2004) and the *Guidelines for Developing and Managing Ecological Restoration Projects* (2005).

With regard to ecosystem-specific guidance and guidelines, however, there are several gaps which can be attributed to a lack of research and practice in specific ecosystem types. For example, there is little or no guidance available on restoring either benthic oceanic (deep sea) or polar and arctic ecosystems. Furthermore, specific guidance is somewhat lacking for alpine regions, tropical savannas, tropical montane forests, and lowland tropical moist forest ecosystems. With regards to island ecosystems, there is considerable complexity and variation to be considered. Accordingly, it will continue to be difficult to fill this significant gap except on a case by case basis. Nevertheless, some attempts at synthesis have recently appeared, e.g., for arctic and alpine ecosystems, and a number of international consortiums are getting under way to tackle the problem of providing generic guidelines for restoring marine and deep ocean ecosystems as well as mega-diverse tropical forests of different types. Lastly, some of the ecosystem specific guidance lacks a multi-criteria approach whereby the social, economic and ecological aspects of design and implementation are fully taken into account.

There are also geographical disparities in the guidance documents that may be construed as gaps, in particular, the majority of these documents are produced in the developed countries and refer to their own, particular national and local circumstances. As a result, a disproportionate number of these documents come from Australia, Canada, European Union member states, New Zealand, South Africa, and the USA, with a small number of Latin American countries and India relatively well represented. Global-reach documents by intergovernmental and non-governmental organizations have, in some cases, succeeded in filling these gaps. Least represented in these documents are the countries of Africa (excluding South Africa), the Pacific Islands, and Central and Northeast Asia.

The issue of geographical disparities for ecosystem types is equally applicable to the landscape-scale guidance documents where certain topics such as invasive species and prescribed fire are disproportionately addressed by the developed countries. Work on integrated coastal zone, watershed and river basin management as well as other multi-functional production landscapes is fairly well-developed and highlighted in Document 2. Perhaps the only theme adequately

dealt with on a global basis is that of forest landscape restoration due the efforts of the IUCN and others. However, those documents tend to be policy-oriented rather than technical in nature.

With regard to sector-specific guidance, there are a number of gaps, such as transport, energy, construction, and health, which exist irrespective of geography or ecosystem type. Although ecosystem-specific and landscape-scale guidance is often applicable to these sectors, public and private agencies should increase their efforts to develop and make available guidance documents that are directly relevant to key sectors of national and sub-national importance, such as water treatment and sanitation, food and water security, and climate change adaptation.

- It should be noted that most documents in this Information Note are in English, with a few in Spanish and French. Therefore, it would be helpful to ascertain whether documents in other languages exist which may fill the above-cited gaps.
- The most effective way to fill any and all of the above gaps is for all stakeholders - governments, corporations, NGOs and communities - to focus their attention on the opportunities and challenges for recovering biodiversity and ecosystem services in degraded ecosystems, and to generate funding and other incentives for restoration research and practice.
- A “living” document database within a larger ecosystem restoration portal or clearing house mechanism would be one effective way to monitor developments in available guidance as well as catalyze future work to address these gaps. This document database would also reduce the perception of gaps by making available all guidance documents in an easily searchable format.