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

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1. Principles...foundation for all restoration activities

2. Guidelines...tools for practitioners

3. Implementation Framework...process for consistent application
What is Ecological Restoration?

**Definition**

The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed (Society for Ecological Restoration International 2004).

**Goal**

To initiate, re-initiate, or accelerate processes that will lead to the evolution of an ecosystem that is characteristic of a protected area’s natural region…not to reproduce a static historic ecosystem state…
Why Do We Restore? (1)

Protected natural areas

• Play a critical role in the conservation of biodiversity and natural capital
• Are established to protect natural heritage for all Canadians to experience, learn, discover, and appreciate into the future
• Face various challenges

Ecological Restoration

• Offers a way of halting and/or reversing ecosystem degradation
Why Do We Restore? (2)

To Improve Ecological Integrity

- Restore ecosystem functions (e.g., fire, flood)
- Control harmful invasive species
- Replace lost or fragmented habitat
- Connect protected areas with surrounding landscapes
- Clean up chemical contamination
Why Do We Restore? (3)

To Connect Canadians to their Heritage Places

• Reflect the relevance of the place to Canadians through enhanced visitor experience and education
• Enhance understanding, appreciation, support, and engagement towards natural and cultural heritage
• Support long-term community-based engagement for the conservation of natural and cultural heritage
Development Process

Consensus of a broad range of experts, managers, and jurisdictions

Multi-jurisdictional Working Group

- Provincial and Territorial Protected Areas Agencies
- Parks Canada and other Federal Departments
- Canadian and International Universities
- US National Park Service
- Society for Ecological Restoration International and its Indigenous Peoples Restoration Network Working Group
Principles of Good Ecological Restoration: “The 3 E’s”

Effective in restoring and maintaining ecological integrity
Principles: “The 3 E’s”

Efficient in using practical and economical methods to achieve functional success
Principles: “The 3 E’s”

Engaging through implementing inclusive processes and by recognizing and embracing interrelationships between culture and nature
125 Guidelines for Ecological Restoration

• Selected according to the degree and type of intervention required to meet goals and objectives

• Specific recommendations for intervening in a manner consistent with the 3 principles
Ecosystem Degradation and Restoration Model

- **Fully functional**: Requires Physical-Chemical Modification
- **Non-functional**: Requires Biological Modification

Ecosystem Degradation and Restoration Model:

- **Abiotic Barrier**
- **Biotic Barrier**

Ecosystem State:

- **Degraded**
- **Intact**
Guidelines for Ecological Restoration

Improvements in Management Strategies
• Restoration of natural disturbances and perturbations (20)
• Control of harmful invasive species (20)

Improvements in Biotic Interactions
• Re-creation of native communities or habitat (9)
• Species re-introductions for functional purposes (14)

Improvements in Abiotic Limitations
• Landforms (12)
• Hydrology (18)
• Water and Soil Quality (10)

Improvements in Landscapes and Seascapes (21)
Examples of Guidelines (1)

Improvements in Management Strategies

- Restoring natural frequency of fire, floods, insect outbreaks
- Promoting natural regeneration and nutrient cycling
- Removing invasive species
- Promoting responsible exploration and learning activities
- Seeking advice of visitor, education and cultural resource specialists
- Respecting cultural heritage resources in the area

Improvements in Biotic Interactions

- Using native species and genetic material
- Considering interactions among species
- Considering individual species recovery plans while working towards the goal of restoring ecological integrity of the protected area
- Working with neighbours and other stakeholders and partners
- Facilitating public engagement, understanding, appreciation
Examples of Guidelines (2)

Improvements in Abiotic Limitations

• Considering impacts on cultural resources and visitor experience before removing constructed features, including dams and weirs
• Using natural organic material to amend soils
• Restoring natural hydrologic flow regimes
• Protecting surface water quality

Improvements in Landscapes and Seascapes

• Identifying relevant ecosystem boundaries
• Favouring ecosystem connectivity
• Identifying and considering local and global threats
• Increasing public understanding, appreciation, support
• Recognizing the need to adapt to global challenges such as climate change
Implementation Framework

7 step planning and implementation process: How to use the Principles and Guidelines in a protected areas context

• Engagement and communication with partners, stakeholders, public

• Relevant legislation, policies, and strategies (Environmental Assessment, Species at Risk, CRM Policy, Invasive Alien Species Strategy)

• Site, regional data; scientific, traditional knowledge

• Clearly-defined goals and objectives

• Linkages between monitoring, reporting, and planning processes

• Adaptive Management
Step 1
Identify Natural & Cultural Heritage Values

Step 2
Define the Problem

Step 3
Develop Restoration Goals

Step 4
Develop Objectives

Step 5
Develop Detailed Restoration Plan

Step 6
Implement Detailed Restoration Plan

Step 7
Ongoing Engagement with Partners, Stakeholders, Public

IUCN Categories, Legislation, Management Plans

Ecological Restoration Principles

Ecological Restoration Guidelines

Ecological Models or Experiments

Field-Scale Experiments

Site Data – Monitoring, ATK, Other
Ecoregion Data – Landscape context, Reference Area, Case Studies

Ecological Restoration Guidelines

Implementation Framework
Next Steps

- Implementation in planning and priority setting in Protected Areas active management programs
- Continued broad-based collaboration
- Demonstration of best practices through case studies that illustrate real-world application
- Evolution of guidelines in response to new issues, information, knowledge, and understanding
- Development of additional tools and resources in response to needs and priorities of protected areas jurisdictions
## Acknowledgements

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