

CAROLINIAN CANADA COALITION

Collaborating for a Healthy Ecoregion

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Guidelines for Restoring Ecosystems in Carolinian Canada

The Carolinian life zone in Canada, also known as Ecoregion 7E or “Carolinian Canada”, consists of southwestern Ontario south of a line from Toronto to Grand Bend. It is the most ecologically diverse landscape in the province, with vegetation, plants and animals distinct from all other parts of Ontario. Ecologically, it is Canada’s most threatened landscape because of the impacts of agricultural, urban and industrial development over the past two centuries. In southern Ontario, 94% of upland forests were cleared, while more than 70% of all pre-settlement wetlands were converted, and up to 98% of native prairies and savannahs have been lost. Overall, natural cover across the Carolinian life zone now ranges from less than 7% in some areas to less than 18% in others. Essential ecological processes and the quality of water, soils and air have been compromised. Fragmentation has reduced most habitat patches to sizes much smaller than what is required by many native flora and fauna to survive. As a result, the region has the highest concentration of Species at Risk (SAR) in Canada. No region in Ontario is more in need of conservation action, ecological restoration and rehabilitation.

Ecological restoration not only recovers healthy ecosystems, it reduces erosion, creates better soils, windbreaks and hedgerows for agriculture, improves populations of essential insect pollinators, increases wildlife populations, and improves air quality and water quality. Riparian zone plantings, stream bank and floodplain re-vegetation are especially important in restoring healthy watersheds. Ecological restoration also improves economic opportunities for woodlot management, provides vibrant tourism and educational opportunities, and results in better human health and overall quality of life. For these many great reasons, special guidelines have been developed to guide restoration projects in Carolinian Canada.

General Principles

Ecological restoration should efficiently apply practical and economic methods to achieve and maintain ecological integrity and functionality. Restoration should also be an inclusive process, engaging experienced practitioners alongside local communities. It should embrace interrelationships between culture and nature. Consider seeking the involvement of First Nations, local schools, youth groups and naturalists clubs in activities such as collecting seeds (under supervision of a certified seed collector), tree planting, sowing seeds by hand, etc. Once a site is restored, a simple monitoring system can be set up, again involving the community, with volunteers walking through the site and identifying plants, insects, birds, snakes and other wildlife.

Prioritising Sites for Restoration in Carolinian Canada

Restoration in Carolinian Canada is especially important at core natural heritage sites identified in recognized ecoregional plans (such as Carolinian Canada’s “Big Picture” mapping and conservation action plan mapping), as well as in areas identified in approved watershed, municipal and community plans, and at sites that can sustain natural plant communities under future climate change scenarios.

Stretching from Toronto to Windsor, the Carolinian Life Zone of southwestern Ontario is among North America’s most vibrant and fragile ecoregions. Carolinian Canada Coalition (CCC) brings together diverse sectors, people and governments to collaboratively steward southwestern Ontario’s unique habitat network, green infrastructure to support thriving wild and human communities in harmony for generations.

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Wherever possible, restoration projects should aim to restore ecosystems and habitats appropriate to the specific conditions of a site. Factors that should be considered include: physiography, topographical position, soil type, soil moisture, drainage and hydrology. Information on the historic vegetation of a site, if available, can be extremely helpful in developing restoration goals and objectives, and in selecting appropriate seed stock. Where information on historic vegetation is not available, modeling restoration efforts on nearby "reference" sites with similar soil, moisture and topography is recommended. Native prairie grasslands have declined to an even greater degree than forests and woodlands, so reforestation should generally not be attempted at sites better suited to prairie or savannah restoration. The restoration site should also not be subject to future development or be under consideration for an amendment to an existing Official Plan.

Sponsoring / Collaborating Agencies

Agencies and organisations that may sponsor or collaborate in a restoration project should have proven expertise. They may include: Ontario Stewardship Councils, Trees Ontario, Ontario Ministry of Natural Resources, Tallgrass Ontario, conservation authorities, private consultants and academic researchers. Landowners should enter into a Stewardship Agreement with the sponsoring or collaborating agency. Both the landowner and the sponsoring agency should agree to protect and manage the restoration site according to a Site Restoration Plan.

Site Restoration Plans and Stewardship Agreements

A Site Restoration Plan should be prepared by a qualified restoration expert in collaboration with the landowner prior to implementation. The Site Restoration Plan should aim, wherever feasible, to replicate the site's historic (pre-settlement) vegetation and ecological functions based on historic vegetation mapping (when available), and/or be based on nearby sites displaying similar ecological conditions (reference sites). Stewardship Agreements should normally indicate that the restoration site will be protected and managed according to the Site Restoration Plan, and should clearly identify roles and responsibilities of the landowner and the sponsoring or collaborating agency. They should also establish responsibility for costs relating to the restoration project.

Site Preparation

Remove any structures such as buildings, roads, fences which are not required or which may pose liability risks in the future. Remove invasive species before planting, as this is the only opportunity to properly eradicate them. Clean machinery before entry to the site, and use a reliable seed/seedling source to reduce the likelihood of introducing invasives. At some sites it will be necessary to consider whether restoration of hydrological systems is appropriate (*i.e.*, removal of tile drains to create wetlands). Hydrological process restoration should take into account neighbouring properties since removal of tile drainage may flood adjacent farmland or have other problematic impacts.

Stock Purchase and Planting

Seeding with site-appropriate native herbaceous mixes in association with planting of tree seedlings can significantly enhance survival rates, reduce competition by invasive species, reduce tending costs, and result in habitat restoration that is better suited for native flora and fauna, including the numerous Species At Risk of Ecoregion 7E. Work with a knowledgeable restoration expert to generate a list of native species that is ecologically appropriate for your site and your long term objectives. Direct sowing of a mixture of herbaceous and tree/shrub seeds, combined with planting some tree/ shrub seedlings, works very well on many sites in southern Ontario. Where possible, use seeds from as close to your property as possible. Avoid non native species, except in very exceptional circumstances (*i.e.* on sites heavily prone to erosion, consider planting a fast growing, non-invasive hedgerow, etc). It should be noted that projects can be restricted by seed availability, and that seeding may have to be staggered over as many as three seasons to ensure that a full spectrum of appropriate species are planted.

Tending and Site Maintenance

The long term management should be decided upon prior to restoration, as this may affect the choice of seeds or seedlings planted. Depending on the objectives of the landowner, restored sites may need little or no long term management. In some cases, it may be desirable to maintain the site as a grassland or prairie, in which natural disturbance such as flooding, fire or the modern equivalent – mowing – may be required. Tending of woody plants to maintain high survival and growth rates may be necessary, and may include controlling competition from other vegetation and limiting damage from animals and other pests. Responsibility for tending operations, with specifics identified, should be agreed upon in the initial Site Restoration Plan. Monitoring should be undertaken every 1 to 2 years for the first five years, and every 5 years for the next 20 years, and be supervised by a qualified restoration expert to determine if: best management practices are being applied; habitat restoration is occurring as desired; modifications to management methods are required in order to meet the restoration goals for the site.

For additional information

National Parks Directorate. 2007. Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas. Compiled by: National Parks Directorate, Parks Canada Agency, Gatineau, Quebec. 108 pp. *See also the video at:*
http://www.pc.gc.ca/docs/pc/guide/resteco/video_e.asp

Society for Ecological Restoration International Science & Policy Working Group. 2004. The SER International Primer on Ecological Restoration, Version 2. Downloaded from: http://www.ser.org/content/ecological_restoration_primer.asp. Accessed January 2009.