

Wetland Restoration and Rehabilitation

Wetlands filter water, moderate water temperature, protect against floods, keep stream flows constant, store carbon, recharge groundwater and control erosion. They are home to the greatest diversity of life in the world including one third of Canada's vulnerable, threatened and endangered species.



MANY PEOPLE ARE SEEKING to help damaged wetlands. In restoring wetlands, we try to re-create past conditions. In rehabilitating wetlands, we may also strive for past conditions but mostly try to prepare the wetland to better function in our changed landscape. Both actions are commonly referred to as restoration: re-establishing vital ecological functions and helping to conserve local biodiversity. This guide is designed to steer you to further information, advice and materials from individuals and groups that specialize in wetland restoration.

Why Restore Wetlands?

Filling and draining have destroyed 70 percent of Southern Ontario's original wetlands. Without wetlands, streams flood in the spring and trickle in the early fall, stream temperatures rise, water tables drop, and habitat is lost, endangering species such as king rail (*Rallus elegans*) and small white lady's-slipper (*Cypripedium candidum*). Protecting wetlands is the first priority. Restoration and rehabilitation efforts help to repair damage but cannot completely bring back what has been lost.

Restoring wetlands involves bringing back areas degraded through actions such as in-filling, changes to drainage patterns,

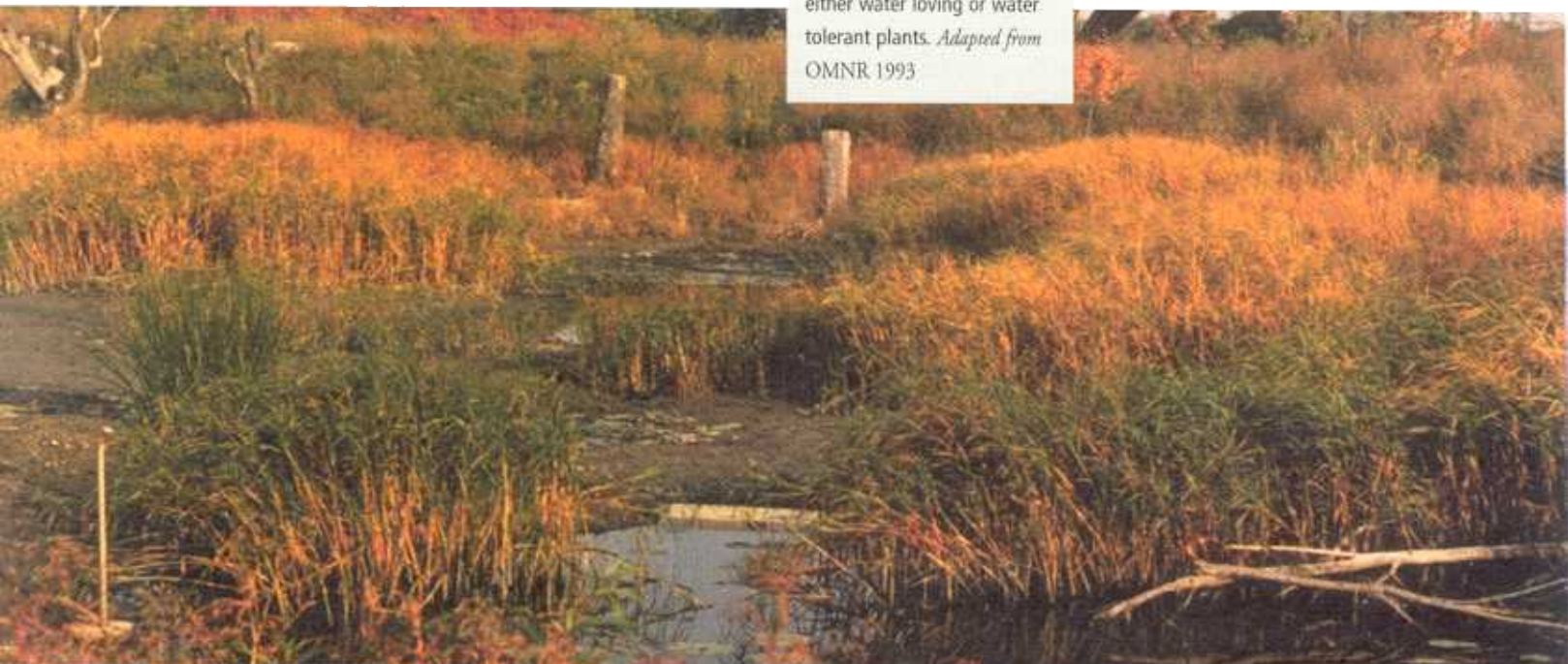
sedimentation, vegetation removal, and pollution to a state similar to pre-disturbance conditions, or to a state in which wetlands can function in a changed environment. **Re-creating** wetlands involves bringing back once-existing marshes and swamps. Some study is usually needed to determine if present conditions will support a wetland.

Protection comes first. Created and restored wetlands lack the complex functions and diverse species of naturally occurring healthy wetlands. Existing wetlands cannot be replaced, and creation or re-creation rarely compensates for destroying or degrading existing marshes, fens, bogs and swamps. Before attempting to create wetland habitat, ask yourself if your

resources would be better used in protecting local wetlands.

Wetlands are lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case, the presence of abundant water has caused the formation of wetland soils and has favoured the dominance of either water loving or water tolerant plants. *Adapted from OMNR 1993*

below: Chester Springs Wetland, Toronto. A habitat creation project by the Task Force to Bring Back the Don included excavation of the basin on the floodplain, planting with marsh plants and installation of habitat structures such as logs.





Marshes (shown on page 1) Shallow water areas, or areas of water-saturated soil, dominated by non-woody plants such as cattails, rushes, pond lilies and submerged plants.

Swamps and swamp thickets (top) Forests or shrub areas that are flooded at least part of the year.

Bogs (cente) Acidic peatlands dominated by sphagnum moss with no water inflow or outflow other than groundwater, precipitation, and evaporation. Bogs often have a low diversity of species.

Fens (bottom) Acidic to alkaline areas dominated by grasses, sedges and rushes, often with peat accumulation and water slowly moving through the wetland.

People, Nature and Wetlands

Altering aquatic habitat seems to come naturally to humans. Large-scale in-filling and draining has had obvious impacts, but so have our own curiosity, creativity, and sincere desire to help nature. The results are mixed. Dug ponds are a good example. Deep ponds are created for habitat and scenery, but without any wetland plants they lie exposed, rising in temperature and growing algae. Often the solution is to divert cold-water streams into the pond, flushing out warm water and nutrients. Yet this damages downstream habitat and leaves the pond as lifeless as before. It is also illegal to create such a pond in Ontario. Habitat creation can also have its negative impacts. Clearing trees in a swamp and creating open water with cattails can displace swamp species, while dredging can cause siltation elsewhere in a wetland. Any work that removes vegetation or changes water levels, even temporarily, can stress a system and allow opportunistic plants such as purple loosestrife (*Lythrum salicaria*) to invade. Nature has created wetlands that are complex. Great care must be taken when tinkering with them.

Getting Started

Restoration activities will depend on your goals, what naturally would occur, and what currently exists.

Find out what the wetland was once like. Look up any original surveys of the area. Ask local residents and naturalists. Get to know your remaining local wetlands. Find a wetland within the watershed on which to base your planning. If there are peat soils, take a close look (you may need help from a nearby university): peat is partially decayed vegetation and will provide clues as to whether the wetland had trees, moss, cattails or rushes.

First conduct an inventory of the site. You may realize that some restoration activities could displace important existing species.

Environmental considerations:

- Has local hydrology changed? Is the site still wet enough? Have water level fluctuations increased?
- Are you altering or destroying existing habitat, such as a cold-water stream?
- What are the long-term forces at work? Will the site silt up? Get dumped in? Go stagnant?
- Will the wetland require future maintenance and who will perform it?

Setting Goals

A wetland can support waterfowl, be a quiet refuge, control floods, and perform many other functions. Examine site conditions and the natural wetland functions that may be impaired. Focus on restoring those functions. Contact your local naturalist club or conservation authority. They may be able to direct you to nearby restored or rehabilitated wetlands. In the meantime, it's worth remembering that sites will evolve after your work is done. Some projects involving woody plants will take years to mature.

Location

Your site should be considered part of the wider landscape of woodland, wetlands, meadows, streams and waterbodies. A strategically placed wetland can link habitats, provide habitat that may be missing in an area, complement adjacent upland habitats, and filter runoff. Learning a little about conservation goes a long way.

Altering Water Levels

If you are restoring a wetland, you may have to restore water levels. This may mean filling ditches, plugging drains or removing dams and blockages. Before you do anything, remember: your actions may affect adjacent habitat and neighbours. Talk to your local conservation authority or Ministry of Natural Resources office to determine what you can do, and get advice on how to restore water levels and create a wet area, if such actions are desirable. Find out about relevant permits and regulations.

Where Do I Get Wetland Plants?

Buy from local native-plant nurseries or grow them yourself from local seed. Never dig up plants from nature. Transplanting stresses existing wetlands and, in turn, degrades them. However, when a wetland area is being destroyed through active development, and you get landowner permission, you may rescue plants.



top: blue flag
bottom: cardinal flower

Locally Native Plants

If you do plant, remember to use indigenous (locally native) plants. This plant stock existed at or near your site prior to European settlement and is well adapted to local conditions. Some non-native plants such as yellow flag iris (*Iris pseudacorus*) and flowering rush (*Butomus umbellatus*) are invasive; they take over an area without providing many of the ecological benefits of native plants, such as habitat. Refer to the first factsheet in this series, *Ecological Restoration Using Native Plants* (FON, 1999) for more information about native plants and their use. Contact the Society for Ecological Restoration for a list of native plant nurseries. *Planting the Seed: A Guide to Establishing Native Plants* (Environment Canada,

1996), a useful guide to establishing aquatic plants, contains a section on seed collection, cleaning and propagation. Remember that if you collect your own seed, conserve — don't collect more than 10 percent of the seed from a plant colony.

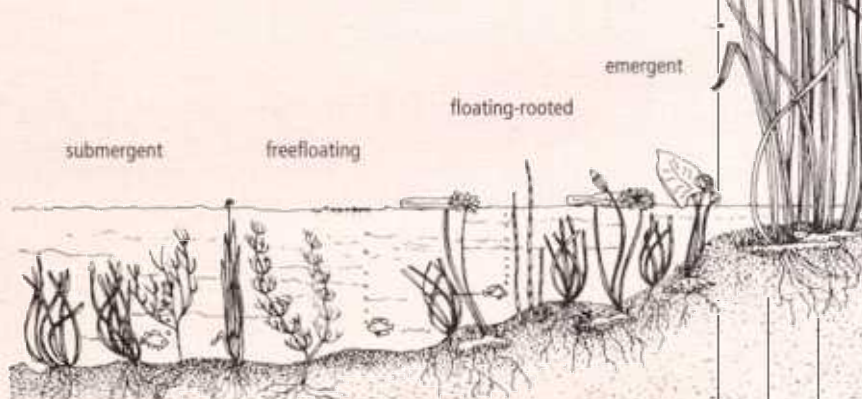
Getting Help

There are many people and information sources that can help make your wetland project fun and exciting. There are national, provincial and local groups that can offer help with restoration. Your local conservation authority will often help assess your site and plan, source materials and help with plantings. Your local Ministry of Natural Resources office can tell you about your wetland and determine if it has been evaluated.

What Do I Plant?

Sometimes an area will naturally become colonized with wetland species, especially if it is periodically flooded and exposed. Removal of exotic invasive plants, such as purple loosestrife, or the European variety of reed canary grass (*Phalaris arundinacea*) may provide the space for native plants to re-colonize. If you do plant, assess the contours, water levels and water fluctuations of your site, and consider the four basic types of plants: emergent, submergent, floating-rooted and free-floating. Look at local wetlands similar to your site and copy the plant forms and species.

Four types of wetland plants:



Information Sources

This list should get you started. Contact the organizations below for more references.

General guides that include wetland restoration information (*wetland focus)

- Aboud, S. and H. Koch. 1996. *A Life Zone Approach to Schoolyard Naturalization, The Carolinian Life Zone*. The Arboretum, University of Guelph. 86 pp.
- Daigle, Jean-Marc and Donna Havinga. 1996. *Restoring Nature's Place: A Guide to Naturalizing Ontario Parks and Greenspace*. Ecological Outlook Consulting and Ontario Parks Association. 226 pp. Available from the Society for Ecological Restoration.
- *Gosselin, Heather M. and Bob R. Johnson. *The Urban Outback – Wetlands for Wildlife*. Toronto Zoo, Toronto. 85 pp.
- Johnson, L. 1995. *The Ontario Naturalized Garden*. Vancouver, Whitecap. 188 pp.
- Agriculture and Agri-Food Canada/Ontario Ministry of Agriculture, Food and Rural Affairs. 1996. *Fish and Wildlife Habitat Management*. Best Management Practices Series. Agric. and Agri-Food Canada/Ont. Min. of Agric., Food and Rural Affairs. 91 pp.
- Society for Ecological Restoration. Semi-annual publication. *Native Plant Resource Guide for Ontario*. Society for Ecological Restoration. 24 pp. listing of practitioners, plant sources, advice, available from the Society for Ecological Restoration.
- Ontario: Ecology, Natural History and Conservation**
- Gonzalez, N. 1996. *Citizen's Guide to Protecting Wetlands and Woodlands*. Don Mills, Federation of Ontario Naturalists. 86 pp.
- Riley, J. & P. Mohr. 1994. *The Natural Heritage of Southern Ontario's Settled Landscapes*. Aurora, Ontario Ministry of Natural Resources. 78 pp.
- Theberge, J. 1989. *Legacy: The Natural History of Southern Ontario*. Toronto, Mc.Lelland & Stewart. 397 pp.
- Federation of Ontario Naturalists 1995. *Natural Invaders: Invasive Plants in Ontario*. Don Mills, Federation of Ontario Naturalists. 15 pp.
- Federation of Ontario Naturalists 1997. *Nature Guide to Ontario*. Toronto, University of Toronto Press. 469 pp.

Brochures, Booklets and Factsheets:

Wetland Creation and Restoration

- Ducks Unlimited Canada. 1997. *Rural Wetlands in Ontario: A Guide for Landowners*. Barrie, Ducks Unlimited.
- Environment Canada. 1996. *Planting the Seed: A Guide to Establishing Aquatic Plants*. Environmental Conservation Branch.
- Environment Canada and Ontario Ministry of Natural Resources. 1997. *Working Around Wetlands? What you should know*. Environment Canada, Environmental Conservation Branch, Downsview.
- Federation of Ontario Naturalists *Backyard Habitats*. Foldout brochure on creating backyard habitat; lists some species and methods to attract certain wildlife.
- Federation of Ontario Naturalists *Four case studies on farmland re-vegetation*; includes wetland projects. 1996.
- Mc. Hattie et al. 1995. *Habitat Creation in the Great Lakes – Techniques for Enhancing Biodiversity*. Environment Canada, Environmental Conservation Branch, Downsview.
- Ministry of Natural Resources. Various dates. *Extension Notes on Wildlife*.

Organizations

- Society for Ecological Restoration** maintains a list of native plant sources, publishes a resource guide. c/o Environment and Resource Studies Program, Trent University, Peterborough, ON K9J 7B8. Phone: 705 748-1634 Email: ser_ont@trentu.ca
- Canadian Wildflower Society** conducts seed exchanges, plant sales, publishes *Wildflower* magazine Box 336, Station F, Toronto, ON, M4Y 2L7.
- Evergreen Foundation**. General habitat creation, speciality in schoolyard naturalization 355 Adelaide St. W., Toronto, ON, M5V 1S2. 416 596-1495. Phone: 416 596-1495 Email: info@evergreen.ca
- Federation of Ontario Naturalists**. Natural history information, wetland conservation (address below) Over 80 local naturalist organizations (contacts available).
- Environment Canada, Environmental Conservation Branch** – Ontario Region 4905 Dufferin St., Downsview. ON M3H 5T4. Phone: 416 739-5829 Web site: <http://www.cciw/green-lane/intro.html>
- The Arboretum**, University of Guelph, Guelph, ON, N1G 2W1. 519 824-4120 ext.2113
- Conservation Authorities** See local directory.
- Ducks Unlimited**. Wetland habitat creation with an emphasis on waterfowl. 566 Welham Rd, Barrie, ON, L4M 6E7. Phone: 705 721-4444, fax: 705 721-4999

Landowner Resource Centre. Source for materials about a variety of conservation activities Box 599, 5524 Dickinson St., Manotick, ON, K4M 1A5. Phone: 613 692-2380, toll free: 1-800-387-5304, fax: 613 692-0831

Ontario Ministry of Natural Resources.

Wetland evaluations in your area, regulations See your local telephone directory

Wildlife Habitat Canada. Help and information about wetlands, funding sources 7 Hinton Ave. N., Suite 200, Ottawa, ON K1Y 4P1. Phone: 613 722-2090, fax: 613 722-3318, e-mail: jladd@whc.org

Additional Help and Funding Sources

EcoAction 2000. Community and local action. Environment Canada, 4905 Dufferin St., Downsview, ON, M3H 5T4. Phone: 416 739-4734, toll free 1 800 661-7785, <http://www.ec.gc.ca/ecoaction>

Community Fisheries Improvement Program & Community Wildlife Improvement Program. Wetlands and upland habitat with emphasis on wildlife. Ontario Ministry of Natural Resources. See your local telephone directory for OMNR offices

Environmental Farm Plan (Ontario Soil and Crop Improvement Association). Environmental projects on farms. 52 Royal Road, Box 1030, Guelph ON, N1H 6N1. Toll free: 1-800-265-9751

Friends of the Environment. Local projects involving community

Canada Trust. Ask your local branch

Mountain Equipment Co-Op. 1655 West 3rd Avenue, Vancouver, BC, V6J 1K1, Attn: Julie Davidson. Phone: 604 732-1989

Shell Environmental Fund. Community focus. Box 100, Sta.M, Calgary, AB, T2P 2H5. Phone: 403 691-2071

Wildlife Habitat Canada and OMNR. Wetland Habitat Fund. Wetland projects. Ministry of Natural Resources, 1 Stone Rd. W, Guelph, ON, N1G 4Y2. Phone: 519 826-4937

Produced by the Federation of Ontario Naturalists and funded by Environment Canada's EcoAction 2000 Program



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