# Urban Parks: Bringing Ecosystems back into Public Spaces

This casebook example explores the programs and activities that are helping to protect and/or enhance greenspaces as settings for public health and well-being. Taken from *Leveraging the Benefits of Greenspace for Environmental and Public Health Benefits: A Casebook of Ontario Initiatives (2017)*


## *Summary*

Urban parks are increasingly being designed to contribute to not only the socio-economic and health well-being of nearby residents, but also to the ecological functioning of these social-ecological systems. O'Connor Park in Mississauga is an example of a newly created multi-functional park space that provides community uses while prioritizing the protection of a natural heritage feature, in this case a wetland and cultural meadow. The park is a demonstration site looking at the implementation and effectiveness of a variety of Low Impact Development technologies. The long-term resilience of the engineered wetland and meadow system is dependant both on the integrity of its design and on the connectivity of the park with the wider ecological system. The design of the park met multiple goals. Multiple goals are a hallmark of the modern urban park system.


## *Introduction/Background*

Protecting and sustaining resilient ecosystem services in urban areas is a challenging task. It requires innovative and adaptive resource management processes that both protect and enhance local resources while engaging and reflecting local community and stakeholder values (Commission for Biological Diversity, 2012). A key challenge for planners is to ensure that the provision of green space meets the local and regional demand for recreation (e.g. how much, where, what kind?). For public health, the challenge is to attract people out of their homes and into these areas so that they will be more physically and socially active (Corkery, 2015).

For ecologists, the challenge is to protect, preserve and enhance urban and regional ecosystem services under unrelenting pressure from human populations, invasive species and global climatic change.

Urban parks are "seen to provide the most ready access to nature for many individuals" (Maller et al., 2006, p. 46). The challenges of maintaining ecological integrity of these parks are multiplied by the overall trend toward habitat loss and fragmentation in the built environment. This trend was illustrated in the newly created O'Connor Park in Mississauga, where the neighbourhood-level shift from abandoned agricultural lands to suburban development was well-documented during the design and construction phases of urban development (Figures E-1, E-2).

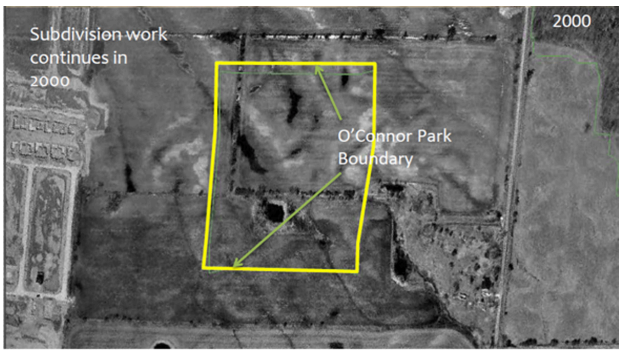


***Figure E-1.*** *O'Connor Park Neighbourhood in 2000 (Source: Ronan and Szczepanski, 2016)*


***Figure E-2.*** *O'Connor Park Neighbourhood in 2010 (Source: Ronan and Szczepanski, 2016)*

McKinney (2002) points out that "the most effective (and cheapest in the long term) strategy is to preserve as much remnant natural habitat as possible" (p. 886). In urban areas, rare species and remnant natural habitats are most common in city parks, cemeteries, railroad trackways, vegetated areas under transmission lines and other public rights-of-way that are protected from development (McKinney, 2002). These ecosystem fragments have been found to be "far more important than their limited size and disturbed state might suggest" (Rudd et al., 2002, p.368). Dearborn and Kark (2009) put forward a range of possible motivations for urban biodiversity, ranging from those primarily benefitting nature, to those primarily benefitting humans. They suggest that a clear articulation of the goals of this work will help both communicate the rationale to the public and interested stakeholders, and allow them to assess progress in achieving the goals. The seven motivations are: preserving local biodiversity, creating stepping stones to non-urban habitat, understanding and facilitating responses to environmental change, conducting environmental education, providing ecosystem services, fulfilling ethical responsibilities, and improving human well-being (Dearborn and Kark, 2009, p.3).


**Illustrated rendering of O'Connor Park (Drawing prepared by PMA Landscape Architects for the City of Mississauga)**

***Figure E-3.*** *Design of O'Connor Park, Mississauga (Source: CVC, 2014)*

## *Health and Well-being*

Public health interest in the link between 'contact with nature' and health and well-being is growing exponentially. Nonetheless, public health strategies have yet to maximize the benefits of nature, such as the benefits of nature contact as a health promotion intervention for populations (Maller et al., 2006). A number of green space features have been found to positively impact health including: high neighbourhood green space density; green space in close proximity to residences; diversity of plants; perceived cleanliness; perceived safety; play structures; grass and large trees; water features; community gardens'; and, accessibility to a range of ages and mobility levels" (Zupancic et al., 2015, p. 20). Increasingly, the psychological and psycho-social benefits generated by the protection, enhancement and preservation of urban biodiversity are receiving attention (Fuller et al., 2007).

What are considered desirable park attributes varies, depending on the populations being served. For example, seniors may value access and perceived safety; children and youth may value recreational amenities and un-structured opportunities to explore; and adults may value peacefulness, walking trails and opportunities for socializing. Desirable park attributes also depend on the characteristics of particular sub-populations, for example, the mobility challenged, dog walkers, cricket players, mountain bikers or hikers.

## *Actions*

O'Connor Park in Mississauga is an example of a newly created multi-functional park space that has prioritized the protection of a natural heritage feature, in this case a wetland and meadow (Figure E-3). It was built on former agricultural land that included six small orphaned wetland ecosystems supporting bird

and reptile populations as well as other wildlife. These 'natural area remnants' (see Discussion, below) were subject to statutory protection by the Ministry of Natural Resources and Forestry and Credit Valley Conservation. The site is completely surrounded by new subdivisions and is a significant greenspace within the Churchill Meadows Community residential neighbourhood. The property is part of the Sawmill Creek subwatershed, which drains into the Credit River and then in to Lake Ontario. After extensive consultation, the final design for the park recommended consolidating the existing wetlands into one larger 'enhanced natural area'.

In an effort to maintain ecological systems to the extent possible, 39% of the new park is a restored wetland and meadow system. While the desire to protect, expand and/or create new habitat to enhance and preserve biodiversity in urban areas is a laudable, such areas are in danger of becoming population or habitat 'sinks' that are unable to support self-sustaining populations of the native species they were designed to protect (Taylor et al., 1993). This is due to their relative isolation in a sea of development, as well as the threats posed by non-native species, including predators such as dogs, cats and racoons. Thus, it is important to consider urban and sub-urban parks in terms of both their individual resilience and that of the larger ecosystems of which they are a part.

The park is a demonstration site looking at the implementation and effectiveness of a variety of Low Impact Development (LID) technologies for storm water management, including surface water collection, groundwater recharge areas, engineered subsurface water capture and drainage and permeable pavements and bioswales. Maintaining the water balance for the wetland ecosystem is a key element of the design (CVC, 2014). The wetland includes an island specifically for the local wildlife (particularly the midland painted turtle) to have an undisturbed (by humans) site for laying their eggs, building nests, etc. The park includes an elevated viewing area for people to observe the wetland, as well as themed and natural play zones, trails and sports fields. The site has won a number of local design awards and is put forward as an example of the City of Mississauga and Credit Valley Conservation working "in partnership to balance environmental conservation and recreation needs for residents" (p. 2).

## Discussion

Urban parks are increasingly being designed to contribute to not only the socio-economic and health well-being of nearby residents, but also to the ecological functioning of these social-ecological systems. The resulting designs are, by necessity, place-based and highly contextual and reflect not only the aspirations and needs of the communities, but also the environmental legacy that is bequeathed in the land. This legacy may be negative (i.e. brownfields that require extensive remediation) or positive (i.e. containing swaths of relatively undisturbed native ecosystems). More likely, the land is in the mid-way zone. According to the habitat-loss gradient theory (Whitney, 1985; McKinney, 2002, Figure E-4) through the process of urbanization, an area's original habitat becomes increasingly fragmented and is gradually replaced by the following four types of altered habitat:

i) built habitat (buildings and sealed surfaces, such as roads);

ii) managed vegetation (residential, commercial and other regularly maintained green spaces),

iii) ruderal vegetation (empty lots, abandoned farmland and other green space that is cleared but not managed); and,

iv) natural remnant vegetation (remaining islands of original vegetation, usually subject to substantial non-native plant invasion).

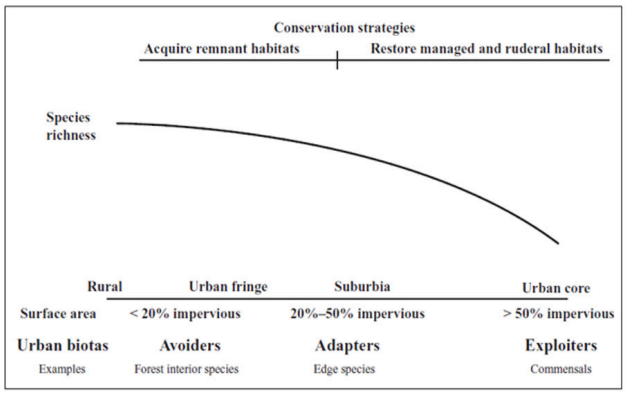


*Figure 2. Urban–rural gradient. This is a very generalized and simplified depiction of changes in surface area, species richness, and composition, as compiled from a number of sources discussed in the text. Two basic conservation strategies with respect to urban sprawl are shown at the top.*

***Figure E-4.*** *Urban-rural biodiversity gradient and selected conservation strategies (Source: McKinney, 2002, p. 885)*

The abandoned farmland purchased for O'Connor Park was a combination of types iii and iv. The long-term resilience of the engineered wetland and meadow system is dependant both on the integrity of its design and on the connectivity of the park with the wider ecological system. Different species have different needs. Large and mobile species, such as pollinators and predators, operate at larger scales than the individual park (Goddard et al., 2009). The need for connectivity is thus species-specific and depends on the scale at which organisms are able to use a landscape (Hostetler, 2001).

Goals of the O'Connor Park project included: protection of natural heritage features (preserving local biodiversity), testing the lifecycle performance of low impact development processes (understanding and facilitating responses to environmental change), conducting environmental education (through signage and look-out points in the park), and improving human well-being (through creating an accessible socio-ecological place for the community to use in a variety of ways). These multiple goals are a hallmark of the modern urban park system. They are quite different from the "static, generic models and standardized people-parkland ratios" which guided much park design in the past (Ibes, 2016, p. 123).

### *Discussion Questions*

1. How are discussions related to urban biodiversity different than those about biodiversity in less disturbed areas?
2. Given the challenges associated with preserving viable ecosystems in urban areas, are ecological restoration initiatives worthwhile? Why or why not?
3. Why is it important to articulate the goals of a park project?

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***For More Information about the Case, See:***

Credit Valley Conservation (CVC). 2014. O'Connor Park. Public Lands Case Study. Mississauga: CVC Water Resources Management and Restoration.
*www.creditvalleyca.ca/wp-content/uploads/2014/04/OConnor-Park-Case-Study-Revised6.pdf*

***For more information related to the Credit Valley Conservation monitoring program refer to the Credit Valley Conservation factsheet:***

*www.creditvalleyca.ca/wp-content/uploads/2016/06/Factsheet_OConnor_Park_Final.pdf*