

Brampton's Natural Capital



Prepared and Designed by Sarah Pollock
 For Sierra Club Ontario
 August 2013

Acknowledgements:

I would like to thank Hamza Ali and Grace Yang for their contributions to the Mississauga Natural Capital booklet, *“Mississauga’s Natural Capital: The Foundation of our Health and Well Being.”* The Mississauga booklet provided the design inspiration and basic content for this Brampton booklet. Many thanks to Ramnique Ubhi of Sierra Club Ontario, and Susan Jorgenson of the City of Brampton for their contributions. I would also like to thank Scott Loyd and Stephanie MacPhee for providing valuable research of Brampton’s natural areas, and the Sierra Club Peel Group for providing useful feedback throughout this process.

I would like to express my gratitude towards Kristina Jackson of Sierra Club Ontario, and Tatiana Koveshnikova of Credit Valley Conservation, for providing valuable input and guidance to help create this booklet.

Finally, I would like to thank the Ontario Trillium Foundation for funding the printing of these booklets, allowing Sierra Club Ontario to distribute this educational material free of charge.

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”

- Aldo Leopold



Ecological Goods and Services

Ecological Goods refers to the consumable products provided by ecosystems, such as food, fuel or building materials. *Ecological Services* are the interactions and functions of ecosystems that provide benefits, free of charge, to humans.



Examples of Ecological Goods and Services Include:

SUPPORTING SERVICES such as primary production, provision of habitat, nutrient cycling, soil formation, production of oxygen and water cycling

CULTURAL BENEFITS such as spiritual, religious, education, recreation and aesthetic values

REGULATING PROCESSES such as pollination, climate, disease, erosion, water purification and natural hazard protection

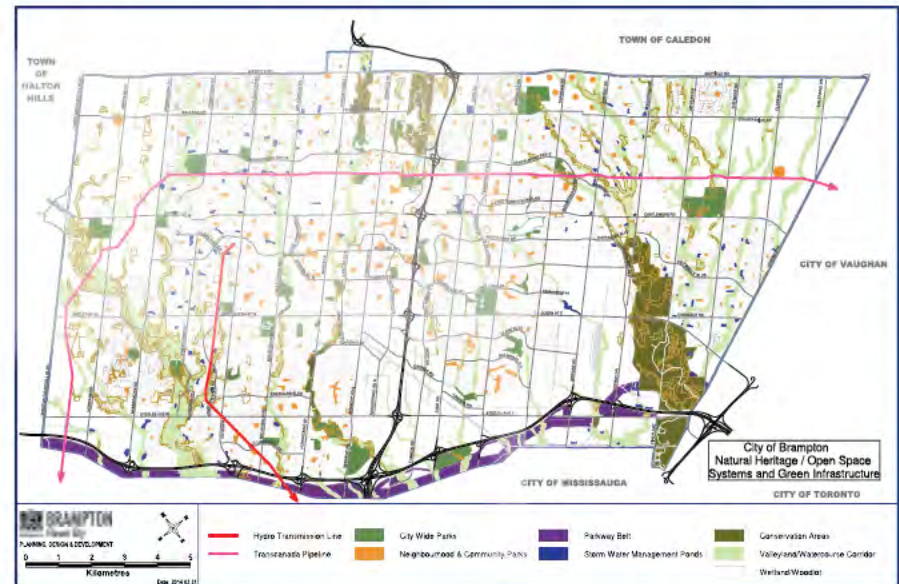
PROVISIONING GOODS such as clean water, food, fuel and genetic resources

Natural Capital

Natural Capital refers to the stock of natural resources and environmental assets, and how they contribute to building healthy communities. The *Natural Capital* perspective is a way of placing a **monetary value** on the *ecological goods and services* to quantify these benefits.

Natural Capital includes minerals, trees, plants, air, animals, water, soil and other living organisms.

Brampton can be thought of as a series of **watershed** ecosystems containing many natural areas such as **woodlands**, **wetlands**, **valleys** and **watercourse corridors**. They also contain urban green spaces such as **urban forests**, parklands and green infrastructure. These ecosystems provide the city with many ecological goods and services, which translates to valuable Natural Capital.



Brampton Natural Heritage/Open Space Systems and Green Infrastructure
Source: City of Brampton, Planning & Infrastructure Services, March 2014

There are public and private costs to maintaining green spaces but the overall benefits of natural capital outweigh the costs in both the long and short term.

Brampton's Watersheds



Brampton's four watersheds, Credit River, Etobicoke Creek, Humber River and Mimico Creek, link the Niagara Escarpment, Oak Ridges Moraine and Greenbelt to Lake Ontario

Credit River Watershed

The Credit River Watershed flows 90km from Orangeville into Lake Ontario. This watershed comprises of urban forests, riparian forests, wetlands, meadows, agricultural land, valleys and watercourse corridors. The ecological goods and services that all of these land-forms provide within the Credit River Watershed are worth **\$371.1 million** annually. This is valued at **\$419 per capita, per year.**²

A **watershed** is a basin-like landform where all water drains, or is "shed", into the same river or stream. This includes rainfall and snowmelt. Watersheds are the collectors, filters, conveyers, and storage compartments of our water supply.¹

Etobicoke Creek Watershed

Located in Brampton, Caledon, Mississauga and Toronto, the Etobicoke Creek Watershed is a highly urbanized and developed region. Continued efforts are needed to protect and restore the aquatic and terrestrial wildlife.³

Humber River Watershed

The Humber River watershed's ecological integrity has been largely protected, with wetlands near the mouth at Lake Ontario. As Brampton becomes more urbanized to its northern and eastern boundaries, a balanced approach is needed to ensure the health of the Humber for the longterm. This watershed is a source of drinking water and provides flood and erosion control.⁴

Mimico Creek Watershed

Mimico Creek flows through Brampton, Mississauga and Toronto. The TRCA is currently working to restore the ecological health of this watershed and has already renaturalized 2 km of Mimico Creek. Projects such as remediation through natural channels, the Mimico Fish Barrier Mitigation Project and Mimico Creek Estuary Wetland Project have enhanced wildlife habitats, restored aquatic and terrestrial ecosystems, improved water quality and mitigated potential flood events.⁵

Woodlands, Urban Forests and Trees

Climate change is attributed to the concentration of carbon dioxide and other greenhouse gases in the atmosphere. This is a global problem that threatens both humans and nature.

Trees and shrubs capture carbon from the atmosphere and store it in the wood and leaves, helping to reduce greenhouse gases in the atmosphere that are changing the climate. Trees in Brampton store 175,000 tonnes of carbon and are valued at **\$5.0 million dollars**.

Trees protect our health by removing pollutants from the air, while producing life-supporting oxygen. Trees and shrubs in Brampton remove 292 tonnes of air pollution each year with an associated removal value of **\$3.2 million annually**.

Trees help to save energy and reduce energy costs by providing shade and protection from wind. Trees in Brampton are estimated to reduce residential energy costs by **\$1.021 million annually**.

Source: City of Brampton Urban Forest Study (2011), <http://www.peelregion.ca/planning/climatechange/reports/pdf/bramp-urb-forest-study-july14-2011.pdf>



Urban forests are all publically and privately owned trees in an urban area, from single trees along streets to remnet forests. One of the major threats to clean air is caused by emissions from traffic and industrial sources in urban areas. These emissions include carbon monoxide (CO), oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and particulate matter (PM10), which have an increasing impact on urban and regional air quality.

Trees in Brampton remove...

- **5,900 tonnes of net annual carbon:** equivalent to annual emissions of 5,100 automobiles or 2,600 single family homes.
- **58 tonnes of PM10:** equivalent to annual emissions of 170,700 automobiles or 16,500 single family homes.
- **29 tonnes of NO₂:** equivalent to annual emissions of 2,000 automobiles or 1,300 single family homes.
- **9 tonnes of SO₂:** equivalent to annual emissions of 13,900 automobiles or 200 single family homes.

Trees in Brampton provide annual services worth **\$4,390,000!**

In addition to regulating air quality, trees, woodlots and forests are also valued for their role in anchoring the soil; providing protective shade canopy; supplying clean water; providing home for a diversity of plants and animals; and offering recreational, spiritual and cultural opportunities such as hiking, walking, biking, and bird watching. Connected natural areas enable species to nest, feed, raise their young and move safely through their range of habitat. A protected natural environment is healthy for people and wildlife alike.

Wetlands

Eldorado Park crosses the Credit River, deciduous forests and the Churchville-Norval wetland complex. This wetland helps to sustain biodiversity, provide healthy ecosystem functions, and provides long-term resilience for the natural ecosystem. Frogs and toads make this area their breeding ground each year.⁷



Claireville Conservation Area has 5.23 hectares of wetlands, the majority of which are associated along the interface between water and land, valley lands and floodplains. Six herpetofauna species (reptiles and amphibians) of regional and urban concern have been identified in this area.⁸

Wetlands are areas of land that are either seasonally or permanently covered by shallow water. Wetlands can be identified by the growth of hydrophytic or water-tolerant plants⁶, such as willow trees and cattails. There are three provincially significant wetlands in Brampton: the Churchville-Norval complex, the Levi Creek complex and Heartlake.

There are many different types of wetlands and those in Brampton include woodland swamps, riverside wetlands and marsh/pond combinations.

Wetlands provide habitats for wildlife and aquatic species, flood and erosion control, opportunities for recreational fishing and hunting, and maintaining water quality. Credit Valley Conservation's Natural Capital study found that wetlands are the most valuable ecosystem to our communities due to their natural benefits.⁹

**Wetlands in the Credit River Watershed,
which originates in Orangeville and flows
through Brampton and Mississauga,
provides services that are worth
\$186.8 million annually¹⁰**

Urban Green Spaces

Many studies demonstrate that having access to nature benefits our physical, social and mental health. For example:

- Children with Attention-Deficit Disorder who participate in outdoor activities, such as camping and fishing, have fewer symptoms and better ability to focus.¹¹
- People who exercise in natural green spaces have more energy and feel more relaxed than people who exercise indoors.¹²
- People living in close proximity to green spaces have better health than those without access.¹³
- Proximity to natural spaces increases property values and tax revenues.¹⁴

Other ways communities benefit from natural features include healthy recreation, clean water, and protection from floods.

Urban Green Spaces are publically or privately owned open spaces in urban areas. They are primarily covered by vegetation, and provide either a source of recreation for its users or a positive influence on the environment. Urban green spaces include urban forests, parks, stormwater management ponds, green infrastructure, etc.¹⁵



Claireville Conservation

Claireville Conservation Area (CCA) is an 848-hectare parcel of land owned by Toronto and Region Conservation Authority (TRCA). Almost half of this land is an **urban forest**. CCA is easily accessible to the public and consists of recreational, tourism and educational facilities and programmes.

Located in the West Humber subwatershed, it is the largest **urban green space** area in the City of Brampton. The CCA provides community activities such as bird watching, boating, fishing, hiking, equestrian trails, and camping sites. Areas open for public use include Indian Line Campground, Claireville Ranch and Etobicoke Field Studies Centre, an outdoor education school operated by the Toronto District School Board.

CCA can be accessed from its north entrance at McVean Dr. and Regional Rd. 107.

<http://www.trca.on.ca/enjoy/locations/claireville-conservation-area.dot>

Source: Toronto and Region Conservation Authority. (2012, June 4). Claireville Conservation Area: Management Plan Update. Retrieved July 29, 2013, from <http://www.trca.on.ca/dotAsset/152471.pdf>

Queen Street East at McVean Drive
Hwy 7, Brampton, ON L6T 3Z8
416-661-6600

The park has a diverse landscape of meadow (49%), forest (47%), and wetland (4%). Its characteristic features include numerous creeks and ravines, flat plains, and rolling hills enriching the forested landscape. CCA is home to various wildlife, including:

- 90 vegetation types, of which 13 are of regional concern.
- 274 flora species, including 58 exotic or possible non-native and 189 native species, of which 33 are regional species of concern.
- 12 bird species of regional concern, and an additional 27 bird species of urban concern



Heart Lake Conservation

Heart Lake Conservation is considered to be a **natural green space**. Located in the Etobicoke Watershed, the area is biologically rich with various habitats and species. This area contains the only two natural lakes in the Etobicoke Creek watershed. Forests, wetlands and recreational facilities make this natural green space a popular destination.

The conservation area is popular for a variety of recreational activities year-round. Heart Lake is stocked with fish for recreational fishing. Popular fish found here include bass and rainbow trout. There are more than eight kilometres of hiking trails and a number of picnicking areas. Cross-country skiing and skating are available in the winter. Park amenities include a splash pad facility and swimming pool, hiking trails, fishing, picnic areas, playground, pedal boat and row boat rentals.

- 40,708 people visited Heart Lake Conservation Area in 2013

(Children under 14 and other activities such as volunteer events, Peel Water Festival, Medicine Wheel Garden Ceremonies and Treetop Trekking were not accounted for in this visitor count.)

Source: Peel Region. (2011, October). Kennedy - Mayfield East: Heart Lake Conservation Area. Retrieved July 30, 2013, from http://www.peelregion.ca/planning-maps/NAI/site_summaries/Kennedy_-_Mayfield_East.pdf

Personal communication. Steve Beausoleil, Heart Lake Conservation Assistant Superintendent, June 4, 2014.

10818 Heart Lake Road
Brampton, ON L6Z 0B3
905-846-2494



Eight species of amphibians and five species of reptiles, all native, are found in this area. Two species, Eastern Snapping Turtle and Eastern Milksnake, are designated Special Concern status and are provincially rare.

www.trca.on.ca/enjoy/locations/heart-lake-conservation-area.dot

Healthier and Happier Brampton - Naturally!

Natural Areas bring *enjoyment* to people and enhance the overall quality of life. There is a direct correlation between quality of life, a healthy environment and a prosperous economy.



An essential part of human well-being includes a healthy and diverse ecosystem. Scientific studies show that people who live in cities with abundant natural areas and urban green spaces have lower stress levels and are happier overall. These areas help to purify and detoxify the air, which translates into huge savings in health costs and a more sustainable economy.

It pays to protect our groundwater, wetlands, forests and other natural resources from threats like over consumption, urban development and pollution so they can continue to provide the benefits for current and future generations of Brampton and other regions.

References

- ¹ Toronto and Region Conservation Authority. (n.d.). Etobicoke Creek Watershed. Retrieved July 30, 2013, from <http://www.trca.on.ca/dotAsset/121468.pdf>
- ² Kennedy, M., & Wilson, J. (2009, November). Natural Credit: Estimating the Value of Natural Capital in the Credit River Watershed. Retrieved July 30, 2013, from <http://www.creditvalleyca.ca/wp-content/uploads/2011/06/Natural-Credit-Estimating-the-Value-of-Natural-Capital-in-the-Credit-River-Watershed.pdf>
- ³ Toronto and Region Conservation Authority. (n.d.). Etobicoke Creek Watershed. Retrieved July 30, 2013, from <http://www.trca.on.ca/dotAsset/121468.pdf>
- ⁴ Toronto and Region Conservation Authority. (2008, June). Humber River Watershed Plan: Pathways to A Healthy Humber. Retrieved July 30, 2013, from <http://trca.on.ca/dotAsset/50159.pdf>
- ⁵ Toronto and Region Conservation Authority. (n.d.). Mimico Creek Watershed. Retrieved July 30, 2013, from <http://www.trca.on.ca/dotAsset/121470.pdf>
- ⁶ Environment Canada. (2013, July 11). About Wetlands. Retrieved July 30, 2013, from http://www.ec.gc.ca/tho-wlo/default.asp?lang=En&n=B4669525-1#_definitions
- ⁷ Peel Region. (2011, October). Eldorado Park and Area. Retrieved July 30, 2013, from http://www.peelregion.ca/planning-maps/NAI/site_summaries/Eldorado_Park_and_Area.pdf
- ⁸ Toronto and Region Conservation Authority. (2012, June 4). Claireville Conservation Area: Management Plan Update. Retrieved July 29, 2013, from <http://www.trca.on.ca/dotAsset/152471.pdf>
- ⁹ Kennedy, M., & Wilson, J. (2009, November). Natural Credit: Estimating the Value of Natural Capital in the Credit River Watershed. Retrieved July 30, 2013, from <http://www.creditvalleyca.ca/wp-content/uploads/2011/06/Natural-Credit-Estimating-the-Value-of-Natural-Capital-in-the-Credit-River-Watershed.pdf>

¹⁰ Ibid.

¹¹ Kuo, F. E., & Taylor, A. F. (2009, September). A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder: Evidence From a National Study. *American Journal for Public Health*, 94(9), 1580-1586.

¹² Pretty, J., Peacock, J., Sellens, M., & Griffin, M. (2005, October). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, 15(5), 319-337.

¹³ Maas, J., Verheij, R. A., Groenewegen, P. P., de Vries, S., & Spreeuwenberg, P. (2006). Green space, urbanity, and health: how strong is the relation? *Journal of Epidemiology and Community Health*, 60, 587-592.

¹⁴ DSS Management Consultants Inc. (2009, March). The Credit River Watershed Property Value Appreciation: Impacts of Natural Features. Retrieved July 30, 2013, from http://www.creditvalleyca.ca/wp-content/uploads/2011/07/CVC-NatFeatRpt-Mar31_09.pdf

¹⁵ Haq, S. M. (2011). Urban Green Spaces and an Integrative Approach to Sustainable Environment. *Journal of Environmental Protection*, 2, 601-608.

Images

All photos are courtesy of Sarah Pollock © 2013, unless otherwise indicated.

Natural Capital Photo: Shaima Al-Kahili, © 2013
Brampton Watershed Photo: Shaima Al-Kahili, © 2013

Protect Your Natural Capital

Plant native trees, wildflower gardens/fusion landscaping and other vegetation to protect soil, improve air quality and provide natural habitats for wildlife.

Get to know what green infrastructure opportunities exist for your home, including green roofs or living walls.

Use gravel or interlocking bricks on your driveway to allow water to soak into the ground. This helps to filter storm water, reduce runoff and replenishes groundwater.

Let our elected officials know that our Natural Capital is a top priority. Ask them to enact protective policies and to support public acquisition programs for natural areas.

Visit **Sierra Club Ontario** at ontario.sierraclub.ca to learn more about your local Natural Capital, special events, and ways to get involved.