

Credit Valley Conservation

February 2012



Draft Fletchers Creek Restoration Study



EXECUTIVE SUMMARY

BACKGROUND

Fletchers Creek Subwatershed Plan was first completed in 1996 in collaboration with the City of Brampton, several property owners and the Credit Valley Conservation Authority (CVC). The Plan provided a strategy to protect and enhance the natural resource features as land use changed based on information available at the time. Fletchers Creek has since undergone significant development in light of growth targets established in 2006 through Places to Grow. As a result, much of the recent and proposed development was not anticipated in the 1996 strategy.

In light of this additional growth, the City of Brampton, landowners and CVC initiated the Mount Pleasant Subwatershed Study in 2005 to develop an updated environmental management plan for Fletchers Creek and adjacent Huttonville Creek (east branch). The Mount Pleasant Subwatershed Study (2011) found that despite standard stormwater management practices, monitoring results indicate that in-stream levels of nutrients, metals, and suspended sediment, as well as erosion and flow regime are increasing within Fletchers Creek. The study recommended that stormwater retrofits within the existing urban areas be implemented across the subwatershed to enhance and protect Fletchers Creek.

This recommendation is consistent with findings across the Greater Golden Horseshoe (GGH) area, among many municipalities Mississauga, Toronto and Hamilton are actively looking for opportunities to implement stormwater management retrofit measures in an attempt to improve water quality, reduce erosion and control runoff volume. The Ministry of Environment (MOE) in the 2003 SWM Planning and Design Manual, and more recently in the Lake Simcoe Act (2008), MOE's 2010 Policy Review of Municipal SWM in Light of Climate Change and the Water Opportunities Act (2010) have acknowledged a need to adopt a more aggressive approach to stormwater management through the use of lot level and conveyance controls in both new and existing urban areas.

To the end, CVC initiated a restoration study in Mississauga's Cooksville Creek and Sheridan Creek Watersheds to assist the City of Mississauga identify stormwater retrofit opportunities. In 2010, under the direction of the Board of Directors CVC initiated a similar study to provide assistance to the City of Brampton in light of the recommendations of the Credit River Water Management Strategy Update (CRWMSU) and Mount Pleasant Subwatershed Study.

PURPOSE

To protect Fletchers Creek, water quality targets laid out in the Mount Pleasant Subwatershed Study require a 'zero increase' in mass loadings for a number of contaminants of concern (refer to Appendix 1). To achieve this objective, structural and non-structural sustainable stormwater practices are recommended throughout the existing urban area. As such, the City of Brampton has initiated a Stormwater Management Retrofit and Enhancement Study.

To support the City of Brampton, CVC completed a comprehensive review of monitoring results which has assisted in identifying priority areas for reducing contaminant loading, as well as

improving our collective understanding of the Fletchers Creek system. The results of this extensive analysis are presented in the Characterization Report (Appendix 1).

The Fletchers Creek Restoration Study (provided in Appendix 2) has used the results of the Characterization Report to identify and recommend priority stormwater retrofit, restoration, pollution prevention, and education and outreach opportunities (Figure 1). As such, the study is intended to inform and assist the City of Brampton as they move forward with the implementation of their Environmental Master Plan and Stormwater Management Retrofit and Enhancement Study.

The Report is also intended to inform and guide land use management decisions for the portions of the Town of Caledon and the City of Mississauga within Fletchers Creek, as well as other stakeholders including provincial and federal governments, non-governmental organization and private landowners as they update their policies and practices related to environmental protection, enhancement and stewardship.

Moreover, the Fletchers Creek Restoration Study looks to assist the Region of Peel in meeting their objectives under the Region of Peel Climate Change Strategy and the Term of Council Priorities through improving stormwater management and building more resilient communities.

SUMMARY OF CHARACTERIZATION REPORT FINDINGS

The results of the Characterization Report indicate that the health of the Fletcher's Creek Subwatershed is being impacted by urbanization, despite the use of stormwater management ponds. As mentioned these monitoring results are consistent with findings from across the GGH, most notably Humber River Watershed Study, Lake Simcoe Stormwater Pond Maintenance and Anoxic Conditions Investigations, and Credit River Water Management Strategy Update, as well as the overall trend to adopt more aggressive lot level and conveyance controls to handle runoff volume and remove pollutants.

The hydrology of Fletchers Creek reflects the significant urban development in the subwatershed, with discharge in the upstream portion of the subwatershed changing rapidly and maximum unit flows increasing more than 10 fold. As a result, the upstream portion of Fletchers Creek is experiencing extensive bank slumping and erosion. Increases in the maximum unit flows and average unit flows have been experienced throughout the subwatershed. In fact, the flow of the creek has on average increased by roughly two orders of magnitude despite the adoption of conventional stormwater management.

The fluvial geomorphology results indicate that Fletchers Creek at the confluence to the Credit River is in adjustment. Throughout the majority of Fletchers Creek, the reaches are in regime or transition. The section of creek downstream of Steeles Ave shows evidence of widening. The permanent site monitoring results indicate that the downstream reaches are moving towards stabilizing and the upstream reach are moving towards adjustment.

Overall, the water quality in Fletcher's Creek subwatershed is threatened in terms of supporting healthy aquatic biota. The influence of highways, urban land use and high population density is

apparent with median concentrations of the total phosphorus, metals, chlorides and bacteria markedly greater than their respective guideline or objective. The Water Quality Index indicates that the water quality at Steeles Avenue has been consistently poor over the thirteen year study period. Water quality during wet weather is of particular concern, with WQI results poor for the entire subwatershed. Water quality during dry weather also exhibits poor conditions upstream of Second Line; however, the WQI below is marginal. These findings are consistent with the Benthic and Fisheries results. Matrices used for both indicated slightly better conditions at the outlet of Fletchers Creek, as compared to upstream. Chloride concentrations are exhibiting increasing trends across Fletchers Creek Subwatershed and are correlated with urbanization.

Despite the rapid changes in hydrology and channel form in some reaches, the creek supports benthic invertebrate communities and fish communities. Headwater sites indicate degrading benthic invertebrate community health, whereas lower reaches indicate unimpaired communities with no trends indicated.

The creek supports some populations of the endangered Redside Dace and in the lower reaches migratory Rainbow Trout. However, the aquatic habitat and fish communities in Fletcher's Creek are showing signs of degradation. Redside Dace are not as widespread as they once were and the population appears to be smaller in size. This is consistent with the results reported by the Ministry of Natural Resource's (MRN) (Guidance for Development Activities in Redside Dace Protected Habitat, 2011). As such, the MNR is requiring the following be implemented as part of the Guidance for Development Activities in Redside Dace Protected Habitat:

- Comprehensive Planning for Subwatersheds – to allow for the evaluation and assessment of potential cumulative effects of urbanization on Redside Dace and its habitat
- Construction Site Preparation – prevent deleterious concentrations of suspended sediments through minimizing disturbed areas, stabilizing soils through erosion control blankets and revegetation efforts, multiple-barrier approach to sedimentation, effective sediment and erosion ponds and sediment traps.
- Stormwater Management – should mimic pre-development hydrologic regimes by incorporating a 'treatment-train' approach and low-impact development designs
- Stream realignment and relocation – in unavoidable situations, realignment and relocation should follow approved subwatershed plan and incorporate natural channel design concepts and habitat features consistent with life-cycle requirements.

Overall, the majority of CVC monitoring stations indicate poor community fish health and all fish species are showing a declining trend.

An analysis of the terrestrial natural heritage features and functions of Fletcher's Creek subwatershed indicates that the majority of areas are in a successional state. Many of the valleylands associated with the creek are regenerating from open fields to thickets and woodlands. Restoration activities have helped aid in this process. However, there is a shortage of natural habitat that can support forest and wetland specialist species presence, and provide basic unimpaired wildlife habitat functions. Impacts to natural features from human activities and disturbance will continue to degrade the quality of remaining habitat. Of particular concern are invasive exotic species such as Common buckthorn and Garlic mustard, and the threat from

invasive forest pests and diseases including Emerald Ash Borer and Beech Bark Disease. Human traffic within natural areas, garbage dumping, off-trail activity and maintenance also degrade remnant natural features especially when they are integrated into the fabric of surrounding communities.

For detailed analysis of the results presented here refer the Characterization Report provided in Appendix 1.

SUMMARY OF RESTORATION REPORT

A number of factors, including the placement of existing stormwater controls, the characterization report results, age of development, land cover and land use were assessed to identify opportunities for stormwater retrofit, pollution prevention, and education and outreach. Traditionally restoration is often implemented as opportunities arise and has largely been successful when coupled with capital projects, like road reconstruction. For this reason, the Fletchers Creek Restoration Report presents baseline information on the land uses and land cover within the subwatershed for each of the four major land types – Residential, Public, Industrial and Commercial, and the Stream and Drainage Corridors. The Study describes issues related to the design and/or management of these land covers and identifies key pollution prevention, stormwater management retrofit, education and outreach opportunities for each type. Figures 2, 3 and 4 provided below summarize identified opportunities for each land use.

Education and outreach opportunities are identified as a key and fundamental initiative for the successful protection, restoration and enhancement of the Fletchers Creek subwatershed. Given the anticipated increase in population in order to adhere to Places to Grow and an already growing gap between municipal responsibilities and available resources, it is important to recognize the value and importance of involving the community and stakeholders. In harmony with the objectives of the City of Brampton's Environmental Master Plan, CVC is committed to assisting in the education of the residential and business community to promote a sense of responsibility over the environment thus ensuring that actions and decisions are done so with the principles of sustainability in mind.

As mentioned, implementation of retrofits has largely been successful when coupled with capital projects. The identification of priority retrofit areas provided below (Figure 1) is meant to guide efforts and assist the City of Brampton with their Stormwater Management Retrofit and Enhancement Study. Figure 1 identifies the area between Williams Pkwy and Steeles Avenues as a high priority area, and the industrial area northwest of Hwy 7 and Hwy 10. This portion of the subwatershed was mostly built before the implementation of stormwater controls and is largely characterized as low density residential with larger lot sizes and single detached homes. Monitoring results have also indicated poor water quality and increasing stream flow within this area.

The full report is provided in Appendix 2. The identified recommendations are summarized in figures below.

Figure 1 Priority Stormwater Pollution Prevention Retrofit Areas

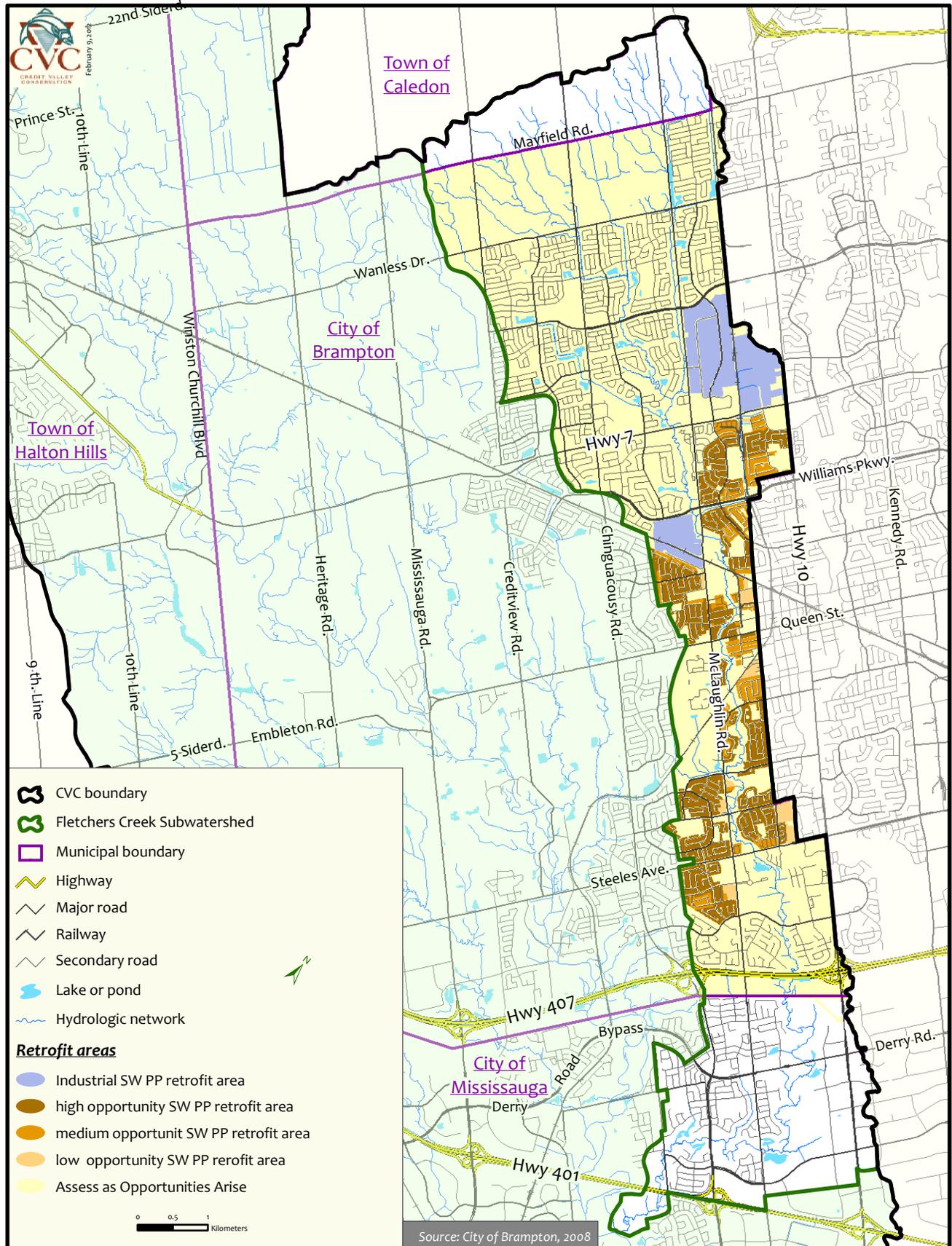


Figure 2 Summary of Restoration Opportunities on Residential Areas

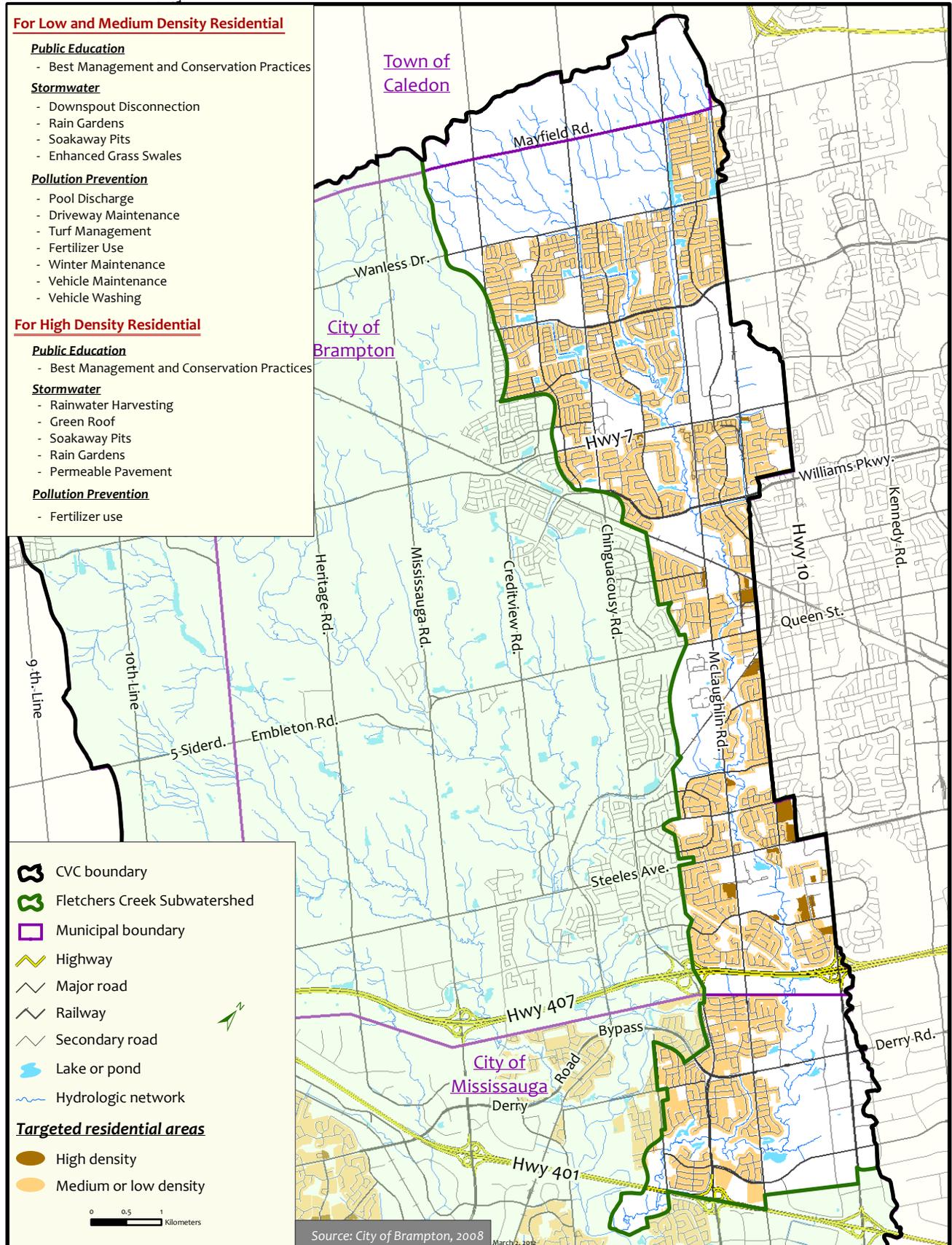


Figure 3 Summary of Restoration Opportunities on Public Lands and Schools

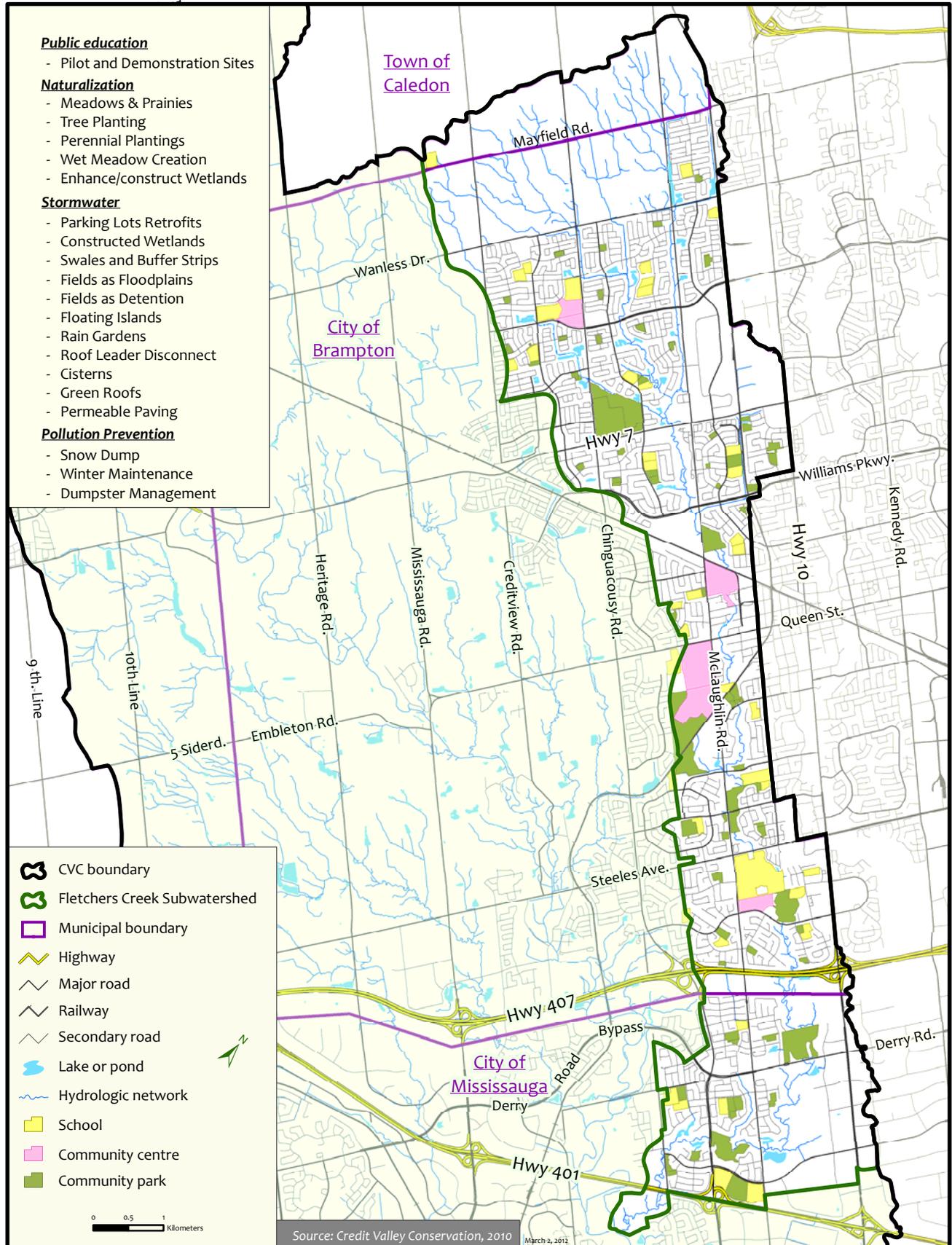
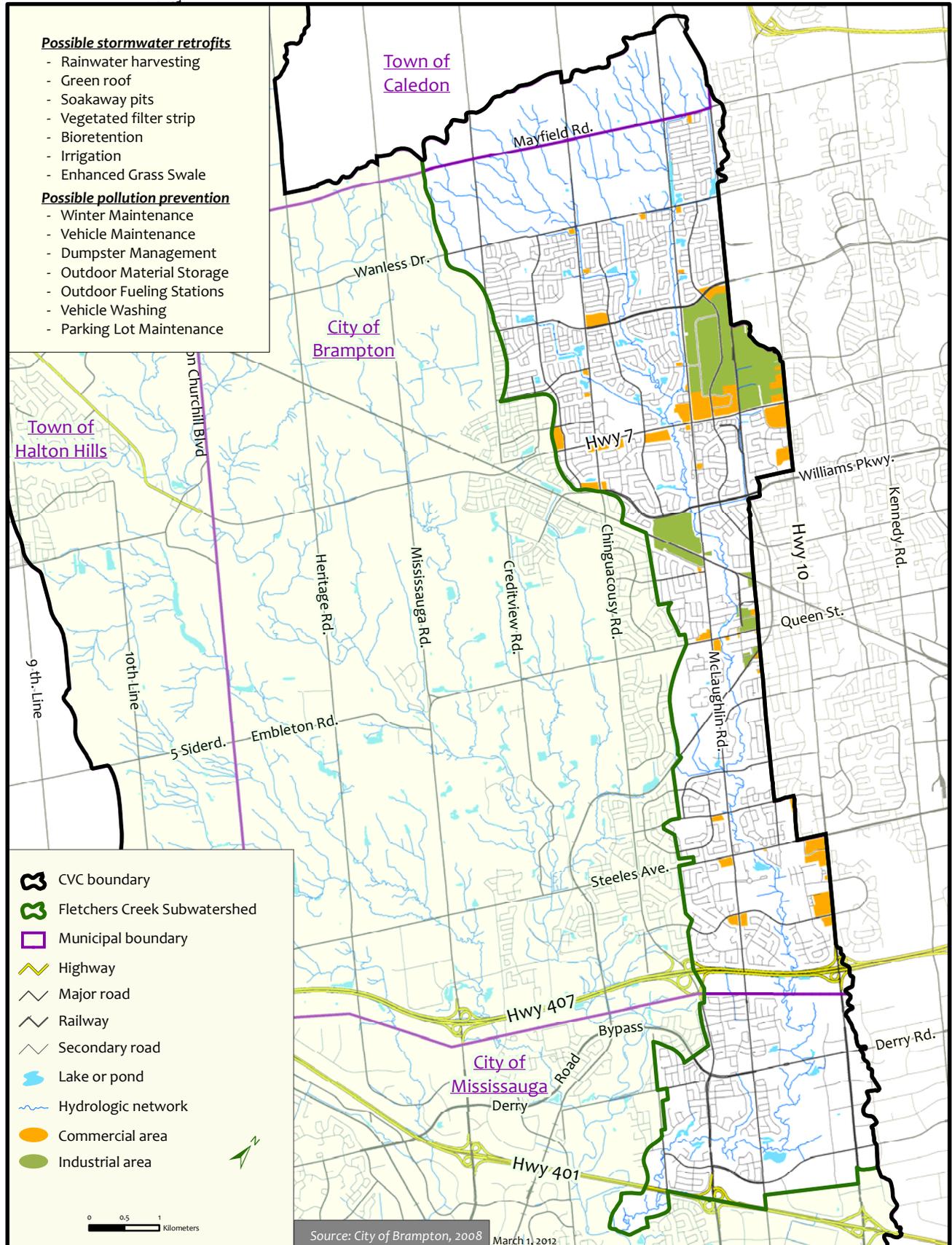


Figure 4 Summary of Restoration Opportunities on Commercial and Industrial Areas



NEXT STEPS

Through significant efforts, including the development of the Environmental Master Plan and the Stormwater Management Retrofit and Enhancement Study, the City of Brampton has committed to protecting Fletcher's and Huttonville Creeks. CVC aims to assist the City of Brampton with these endeavours through:

- Continued monitoring (including real-time flow and water quality for emergency response);
- Providing expertise and assistance as a member of the Stormwater Management Retrofit and Enhancement Study Steering Committee; and
- Providing comprehensive baseline information through the Fletchers Creek Restoration Study and Characterization Report.

In moving forward, CVC will continue to work in partnership with the City of Brampton and watershed stakeholders to implement innovative stormwater management practices and deliver pollution prevention, education and outreach programs. The Floating Islands project in Fletcher's Creek is a leading edge example of the City's commitment to innovative stormwater management. This "First of its Kind" project has been a great success from a social and environmental perspective involving multiple stakeholders from the City, academic institutions, provincial agencies, local community, consultants, manufacturers, and CVC. CVC has also partnered with the Toronto and Region Conservation Authority and the Region of Peel to deliver the Partners in Project Green (PPG) to local businesses within Fletchers Creek in an effort to encourage the adoption indoor and outdoor green technologies (including tree planting, native landscaping, low impact development and pollution prevention). Through CVC's Leaders for Clean Water Program, CVC will continue to:

- Host professional development conferences,
- Conduct performance monitoring of LID sites to provide insight into sizing future stormwater systems
- Provide assistance for LID plan review and construction of LID sites (both new and retrofit)
- Develop retrofit tools and guidance manuals for municipalities, residents and private sectors on the design, construction, maintenance and monitoring of source and conveyance controls.

Through these initiatives CVC will continue to support the City of Brampton's efforts to implement recommendations from the Environmental Master Plan and Stormwater Management Retrofit and Enhancement Study, as well as the objective to improve stormwater management in keeping with the Region of Peel's Term of Council Priorities.