

SYDENHAM CREEK SUBWATERSHED

STEWARDSHIP ACTION PLAN 2009

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SYDENHAM CREEK SUBWATERSHED CHARACTERIZATION

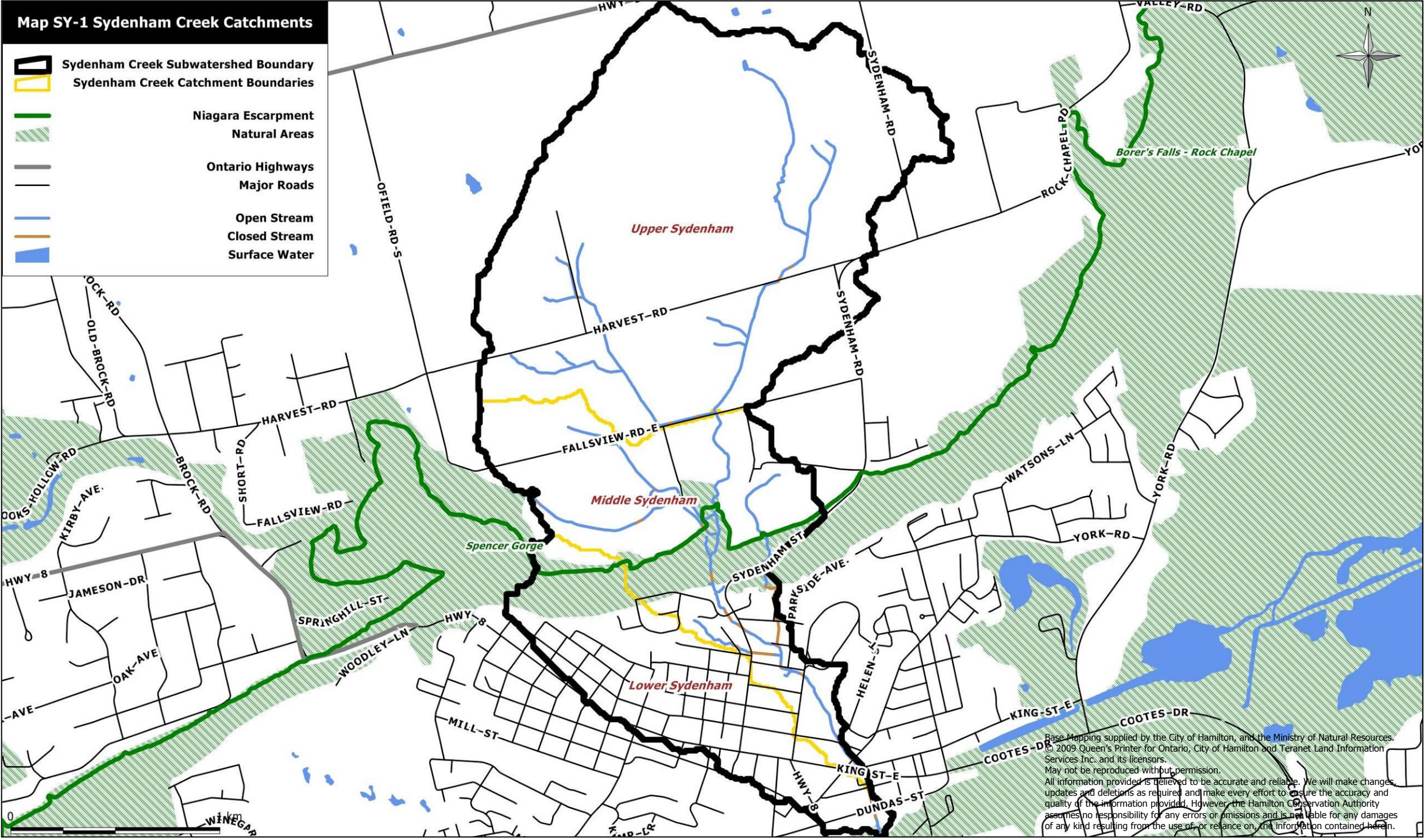
GEOGRAPHIC LOCATION

Sydenham Creek subwatershed is 5.3 km² in area and is comprised of three catchment basins. In descending order from the headwaters to the outlet these are: Upper Sydenham, Mid Sydenham and Lower Sydenham (**Map SY-1**). This subwatershed spans the former municipal boundaries of Dundas and Flamborough, and also falls within two City of Hamilton Wards, specifically Wards 13 and 15.

The headwaters of Sydenham Creek originate immediately south of Highway 5 between Ofield Road South to the west and Sydenham Road to the east. The subwatershed tapers as it flows south and over the escarpment brow. The main channel of Sydenham Creek passes over the Sydenham, Middle Sydenham and Lower Sydenham Waterfalls into the former Town of Dundas below the Escarpment. The southernmost extent of Sydenham Creek crosses Dundas Street as it reaches Cootes Paradise Marsh.

No provincial highways pass through this subwatershed with Highway 5 passing just north of the subwatershed boundary. Major transportation routes include Fallsview Road East, Harvest Road, Sydenham Road and King Street West.

The Niagara Escarpment passes through the Middle and Lower Sydenham catchments of this subwatershed. Additionally, two municipally designated Environmentally Significant Areas (ESAs) are located within this subwatershed: Spencer Gorge and Borer’s Falls – Rock Chapel. These natural areas act as major ecological corridors for terrestrial species as well as serve to maintain water quality and quantity within the stream reaches that pass through these areas, to the benefit of aquatic species.



HYDROLOGY

Sydenham Creek joins Lower Spencer Creek from the east near the intersection of West Street and Dundas Street in Dundas. This creek has a length of 2.6 km and an average channel bed slope of approximately 52 m/km. This subwatershed has a drainage area of

approximately 4.65 km². Within this basin, agricultural land use predominates above the Escarpment and urban land use predominates below the Escarpment (MacLaren Plansearch, 1990).

SOILS

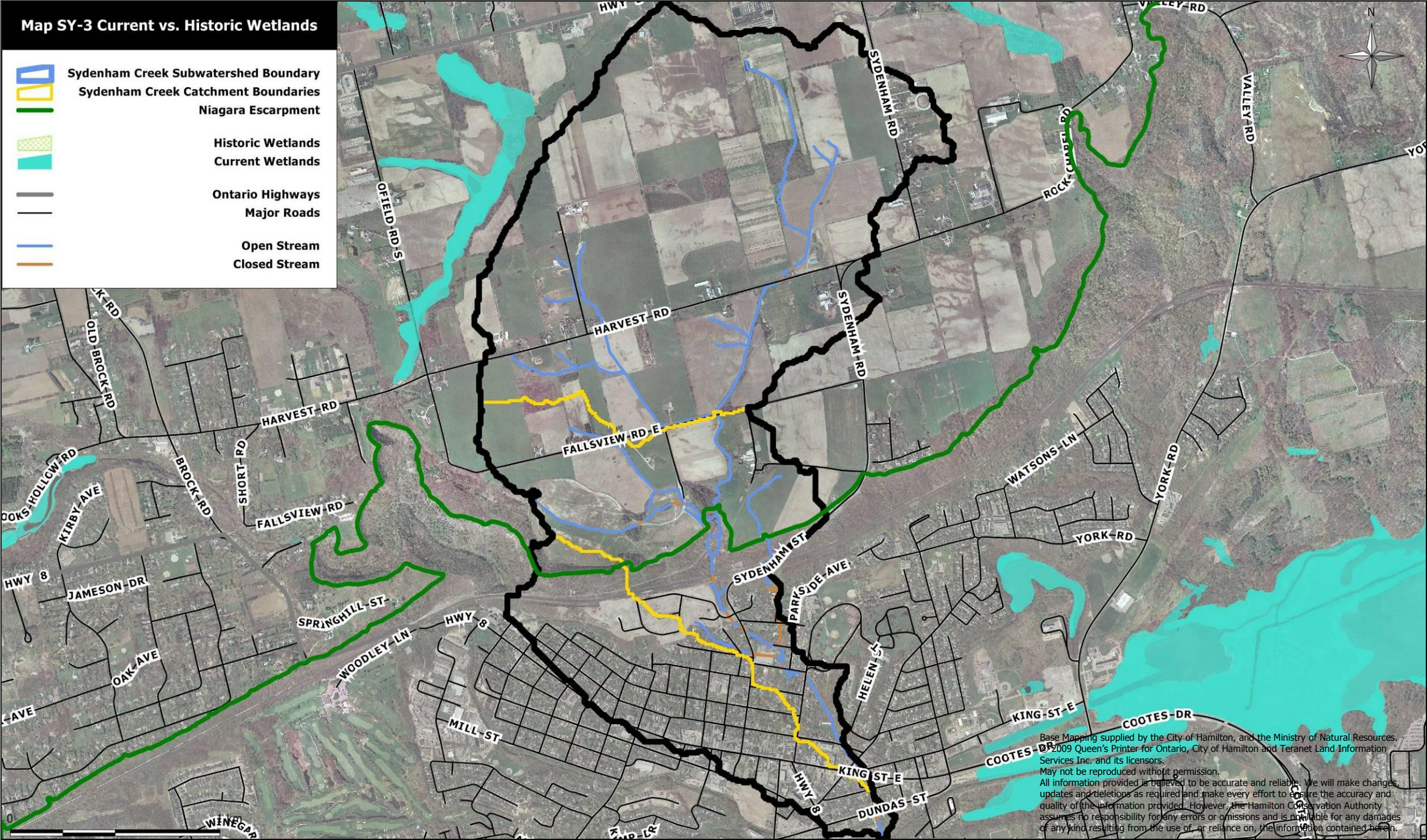
The soil characteristics of the Sydenham Creek subwatershed are shown on **Map SY-2**. Four soils complexes have been identified within the Sydenham Creek subwatershed, as summarized in **Table SY-1**. The sandy and loamy soils of the subwatershed have relatively large spaces between soil particles, and water percolates quickly through these openings.

Soil characteristics vary throughout the subwatershed. The natural drainage of the soil ranges from imperfectly drained to well drained and the erosion potential ranges from very low to high (Canadian Department of Agriculture, et. al., 1965)

Table SY-1: Soil and Erosion Potential in the Borer’s Creek Subwatershed

Soil Type	Natural Drainage	Erosion Factor*	Topography (slope)	Erosion Potential
Cl - Chinguacousy Loam	Imperfectly drained	3	2-5%	Low
Gi – Grimsby Sandy Loam	Well drained	4	6-9%	Moderate
Ol – Oneida Loam	Well drained	2	6-9%	High
Sp – Springvale Sandy Loam	Well drained	4	6-9%	Moderate

** Based on the Region of Hamilton-Wentworth Soil Summary Sheet*



SYDENHAM CREEK SUBWATERSHED CHARACTERIZATION

NATURAL HISTORY & SIGNIFICANT SPECIES

There are no records of established wetlands in the Sydenham Creek subwatershed prior to the mid-1980’s. There are also no records of wetlands currently established in the subwatershed as displayed within **Map SY-3**.

Table SY- 2: Natural Land Cover Statistics

Forest Cover (km ²)	Wetland Cover (km ²)	Meadow Cover (km ²)	Stream Length (km)
0.4	0	0.02	11.9

To date, no benthic or fisheries data has been collected for Sydenham Creek. The Hamilton Conservation Authority will add sampling stations to its Aquatic Resource Monitoring Program to improve this data limitation.

Significant terrestrial species found within the natural areas of this subwatershed are noted within Appendix C. The majority of these species are rare or uncommon within the City of Hamilton and where a species has been designated as a species at risk by the OMNR it is indicated in the appendix. Certain species have been classified by the Committee on the

Endangered

- Loggerhead Shrike
- Red Mulberry

Special Concern

- Eastern Milksnake
- Southern Flying Squirrel
- Monarch
- American Columbo
- Louisiana Waterthrush
- Yellow-breasted Chat

Endangered (not regulated)

- American Chestnut
- Butternut
- Ginseng

Not at Risk

- Sedge Wren
- Brown Snake
- Eastern Screech-Owl
- Red-tailed Hawk

Historical information was not recorded for forest or meadow cover, however current natural land cover statistics are noted within **Table SY-2**. Forest cover accounts for 7.6% of this subwatershed, while meadow cover is 0.4% of the land base. Based on the digital data provided for this analysis, stream length of Sydenham Creek and all its tributaries is 11.9 km.

Status of Species at Risk in Ontario (COSSARO) and listed by the Ontario Ministry of Natural Resources (MNR) as being at risk. Each species on the list is given a status depending on the degree of risk: Extinct, Extirpated, Endangered, Threatened and Special Concern. The species listed below have been designated by the OMNR under the Ontario Endangered Species Act and can be found within the Sydenham Creek subwatershed.

It will be important to create awareness and undertake habitat restoration activities related to preserving and restoring ecological linkages in order to support these species that have been designated by the OMNR, especially those species that are endangered (not regulated).

SYDENHAM CREEK SUBWATERSHED CHARACTERIZATION

CULTURAL HISTORY

Settlement of the Dundas area began after the American War of Independence when Loyalists crossed the Niagara River and moved up Lake Ontario to its western end (Spencer Creek Conservation Authority, 1965). Because Dundas was accessible by flat bottom boats and because of its convenient location between the western farm productions and the only road that opened up access to the interior of the province, the village became the commercial and industrial center at the head of Lake Ontario in the early part of the 1800’s. (Spencer Creek Conservation Authority,1965).

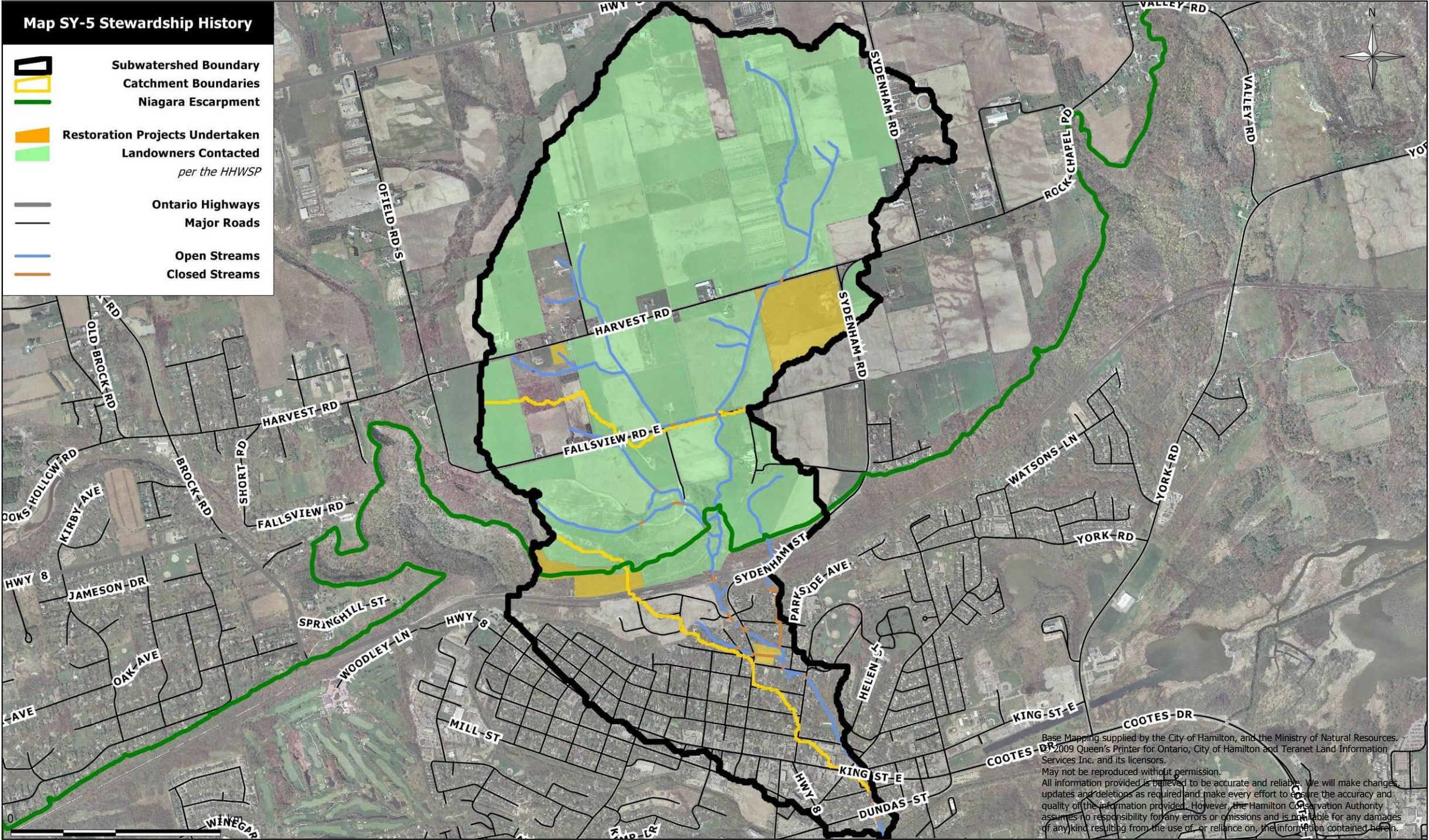
The approximate population of the Sydenham Creek subwatershed is 2814 persons with a population density of about 3673 persons per square kilometer in the urban areas and 28 persons per square kilometer in the rural areas.

Current land use within the Sydenham Creek is predominantly agricultural/rural, with residential being the second most common land use (**Table SY-3**). Residential land use is largely limited to the portion of the subwatershed that falls below the Niagara Escarpment within the boundary of the former Towns of Dundas. Agricultural land use is prominent throughout the remainder of the subwatershed. There is significant open space in this subwatershed centering around the Spencer Gorge and Borer’s Falls – Rock Chapel Environmentally Significant Areas (**Map SY-4**).

Commercial and industrial land use is concentrated along major transportation routes, specifically King Street West in the Town of Dundas

Table SY-3: Land Use Statistics

Area (km ²)	Agricultural (km ²)	Commercial (km ²)	Industrial (km ²)	Institutional (km ²)	Open Space (km ²)	Residential (km ²)	Utility (km ²)	Impervious Surfacing (%)
5.6	3.39	0.07	0.02	0.07	0.4	0.74	0.002	7.6



SYDENHAM CREEK SUBWATERSHED CHARACTERIZATION

STEWARDSHIP HISTORY

Although there are many properties that do not incorporate a portion of a natural feature, there are 161 properties that do contain forest, wetland, meadow or riparian / aquatic habitat (**Table SY-4**). Of these landowners, 19 (or 12%) have been contacted by the Hamilton-Halton Watershed Stewardship Program (HHWSP) (**Table SY-4**). Therefore, there is considerable potential to reach the remaining 88% of landowners with natural features to create awareness regarding Beneficial Management Practices (BMP's) for natural areas and agricultural operations. Landowner contact would be best focused in the Upper and Middle Sydenham catchments where there is the greatest concentration of agricultural operations.

Through this contact there is also great potential to engage landowners in the Watershed Steward Program. Watershed Stewards are landowners who have agreed to protect and maintain the natural features that fall within their property. In addition to landowners who have natural features on their properties, landowners who do not have natural features on their properties can also act as Watershed Stewards as they can be advocates of stewardship messaging in other capacities. There is also a significant opportunity in this subwatershed to contact all landowners without natural areas to create awareness regarding urban BMP's as they relate to urban wildlife, water conservation, storm water management practices, etc.

Environment Canada has provided guidelines for forest, wetland and riparian habitat for subwatersheds and in turn a preliminary analysis has been completed using the guidelines set

out by this agency. **Table SY-5** displays the status of the Sydenham Creek subwatershed when compared to these Federal guidelines.

Due to the planned intensification of the urban parts of this subwatershed, BMP's relating to storm water management must be encouraged and exemplified by partner agencies in an effort to prevent sedimentation and contamination within the system. This is especially important in the Lower Sydenham catchment since much development is planned for this area of the subwatershed.

Although this subwatershed contains prominent natural areas such as Spencer Gorge and Borer's Falls – Rock Chapel it still does not meet Environment Canada's How Much Habitat is Enough Guidelines for forest cover. Forest cover would need to be increased by about 1.6 km² to meet this guideline, with an emphasis being placed on forest patch shape. Additionally, it should be determined whether or not the percentage of forest cover from the forest edge supports interior forest breeding birds.

In this subwatershed there is potential to naturalize an additional 2000 m² by enhancing utility corridors to serve as terrestrial habitat. It is important to work with our large landowners to restore terrestrial and aquatic habitat in the subwatershed. Additionally, it is equally important to work with our ward councilors to generate support for local stewardship initiatives with the public and private sectors as well as our development industry.

Table SY-4: Stewardship Statistics

Approximate Population	Population Density (persons / km ²)	Total # of Properties with Forest, Wetland, Meadow or Watercourse	# of Landowners with Forest, Wetland, Meadow or Watercourse & Contacted by HCA Stewardship	# of HCA Stewardship Watershed Stewards with Forest, Wetland, Meadow or Watercourse	Total # of Landowners in Subwatershed Contacted by HCA Stewardship	Total # HCA Stewardship Watershed Stewards in Subwatershed
2814	Rural - 28 Urban - 3673	161	19	0	31	0

Table SY-5: Environment Canada's How Much Habitat is Enough Guidelines

PARAMETER	% Wetlands	% Stream Naturally Vegetated	Total Suspended Sediments	% Impervious Surfacing	Fish communities	% Forest Cover	Size of largest Forest patch	% Forest Cover 100m & 200m from Forest edge
GUIDELINE	6	75% with 30m buffer on either side	Below 25 mg/L	< 10	Based on historical data / watershed characteristics	30	2km ² & min 500m wide	10% < 100m from forest edge
SUBWATERSHED STATUS	0	21.1%	n/a	7.6	Warm water fishery	7.6	0.34 km ²	100m – 10% 200m – 0%

STRESSES AND STEWARDSHIP ACTIONS

There are twenty seven *stresses* identified as negatively impacting the Sydenham Creek subwatershed. There are three dominant activities occurring throughout this subwatershed that many of the stresses can be attributed to. These activities and their associated stresses are listed in **Table SY-6**.

Table SY-8 outlines the *Stewardship Actions* that have been developed to mitigate the impacts of each of the stresses listed in **Table SY-6**. Specific locations where these stresses are occurring are mapped and inventoried in the subsequent catchment datasheets. Within the Sydenham Creek subwatershed, 32 specific locations where stresses are occurring have been identified; however, this inventory is not exhaustive and therefore implementation of *Stewardship Actions* should be undertaken on a subwatershed scale to ensure that all occurrences of stresses are mitigated.

An inventory count of the number of located stresses in each catchment basin of the subwatershed is listed in **Table SY- 7**. The two most prevalent stresses identified in the

Sydenham Creek Subwatershed are: Stormsewer Outfalls and Outdoor Recreation Related Degradation. These stresses are associated with activities relating to urban and rural living.

Stormwater management in the urbanized catchments of this subwatershed is of primary concern. Stormwater management relates directly to the health of the local fishery as it increases the potential for erosion and contamination in the creek system.

The natural systems within this subwatershed have been altered and reduced in order to accommodate different land uses. The natural systems within both the Upper and Middle Sydenham catchments are limited and as such serve little function with respect to wildlife habitat. Also, insufficiently sized riparian buffers have also been noted as a concern in this subwatershed. It is important to highlight the potential to expand riparian buffers throughout this subwatershed in an effort to re-establish habitat connectivity between larger tracts of habitat, specifically the Spencer Gorge and Borer’s Falls – Rock Chapel ESAs to ensure that these systems function optimally to support ecological biodiversity.

TABLE SY-6: Land Use Activities and their Associated Stresses

ACTIVITY	DEVELOPMENT	AGRICULTURE/NURSERY OPERATIONS	URBAN AND RURAL LIVING
ASSOCIATED STRESSES	Buried Streams	Channelization	Detachment From Nature
	Channelization	Dams	Encroachment
	Erosion	Erosion	Faulty Septic Systems
	Habitat Fragmentation	Habitat Fragmentation	Illegal Fill Placement
	Inadequate Stormwater Management	Invasive/Introduced Species	Inadequate Stormwater Management
	Increased Impervious Surfaces	Insufficient Riparian Buffer	Increased Impervious Surfacing
	Invasive/Introduced Species	Nutrient Loading	Invasive/Introduced Species
	Insufficient Riparian Buffer	On-line Ponds	Insufficient Riparian Buffer
	Litter	Pesticide Use	Litter
	Perched Culverts	Plowed Watercourses	Nutrient Loading
	Sediment Loading	Sediment Loading	Outdoor Recreation Related Degradation
	Site Clearing Prior to Development	Water Takings	Perched Culverts
	Transportation Corridor Expansion		Pesticide Use
			Runoff Contamination via Transportation Corridors
			Stormsewer Outfalls
			Wildlife Collisions

CATCHMENT SUMMARIES

This section of the plan identifies the stresses within each catchment of Sydenham Creek subwatershed. A summary of these stresses and an indication of the stewardship actions available to mitigate the impacts of the stresses are outlined in the data sheets following each catchment map. Ecological monitoring data for each catchment basin is also outlined

following each catchment map. In total, 32 stresses were identified for the Sydenham Creek Subwatershed and inventory counts are presented in **Table SY-7**.

TABLE SY-7: Stresses Inventory by Catchment

STRESS	MAP CODE	NO. IN SUBWATERSHED	NO. IN EACH CATCHMENT		
			Upper Sydenham	Mid Sydenham	Lower Sydenham
Buried Streams	BS	1		1	
Channelization	CH	1		1	
Dams	DM				
Detachment from Nature	DT	1			1
Encroachment	EN	1		1	
Erosion	ER	2		2	
Faulty Septic Systems	SS				
Habitat Fragmentation	HF	2	1		1
Illegal Fill Placement	FP				
Inadequate Stormwater Management	SW	2			2
Increased Impervious Surfacing	IS	2		1	1
Invasive/Introduced Species	IV				
Insufficient Riparian Buffer	RB	2	2		
Litter	LI	2			2
Nutrient Loading	NL				
On-line Ponds	OP				
Outdoor Recreation Related Degradation	OR	4		4	
Perched Culverts	CP				
Pesticide Use	PS	1			1
Plowed Watercourses	PW				
Sediment Loading	SL				
Site Clearing Prior to Development	SC				
Stormsewer Outfalls	SO	9		8	1
Runoff Contamination via Transportation Corridors	TC	2		1	1
Transportation Corridor Expansion	TE				
Water Takings	WT				
Wildlife Collisions	WC				

* The stresses identified within this plan are not exhaustive and therefore there may be stresses occurring within this subwatershed that are not noted within this plan.

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Buried Streams Map Code: BS Definition: The structural alteration of a stream channel, involves piping the creek system underground, eliminating aquatic habitat.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy creeks and the benefits of maintaining our creeks and streams in their natural state.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-4 Page 107 HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55 Fisheries Act, Section 37 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142-158	HCA / HWSC / HHWSP / RAP / WPN / DFO	HHWSP / HWSC	2010-2014
		Undertake a feasibility and prioritization study for “daylighting” buried streams in the study area.			HCA / CITY / DFO / MNR / HHWSP / RAP	CITY	2010-2012
			Work with landowners to undertake daylighting projects as recommended by the feasibility and prioritization study.		HHWSP / HCA / DFO / CITY / HWSC	HHWSP	2012-2014
Channelization Map Code: CH  Definition: The structural alteration of a stream channel, usually involves straightening of meanders and increasing gradient which increases velocity and erosion potential.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy creeks and the benefits of maintaining our creeks and streams in their natural state.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-4 Page 107 HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55 Fisheries Act, Section 37 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142-158	HCA / HWSC / HHWSP / RAP / WPN / CITY / RBG / FSRT	HHWSP / HWSC	2010-2014
		Undertake a feasibility and prioritization study for restoring channelized creeks to those with a natural design.			HCA / CITY / DFO / MNR / HHWSP / RAP	CITY	2010-2012
			Work with landowners to undertake natural channel design projects as recommended by the feasibility and prioritization study.		HHWSP / HCA / DFO / CITY / HWSC	HHWSP	2012-2014
			Work with landowners downstream of channelized sites to rehabilitate the riparian zone to reduce flow velocities, erosion and sedimentation.		CITY / DFO / HHWSP / HCA / RBG / FSRT / HWSC /	HHWSP	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Dams Map Code: DM Definition: a barrier to obstruct the flow of water, usually one of earth or masonry, built across a stream or river.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the detrimental effects of dams as fish barriers and to promote the removal/retrofitting of dams.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-4 Page 107 MNR Fish Barrier Inventory	HCA / HWSC / HHWSP / MNR / DFO	HHWSP / HWSC	2010-2014
		Undertake a feasibility and prioritization study for the removal of dams inventoried.		HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55	HCA / HWSC / HHWSP / MNR	HCA / MNR / HWSC	2010-2012
			Work with landowners to remove/retrofit dams as recommended by the prioritization study.	Fisheries Act, Section 37	HCA / HWSC / HHWSP / MNR / LO's / DFO / CITY	HHWSP	2010-2014
Detachment from Nature Map Code: DT  Definition: The condition of people disassociating their existence from nature.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote BMP's and the ecological significance of natural features.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations PAA-2, PAA-3, EPI -1, EPI-2, EPI-5 Pages 129-138	BARC / CITY / FSRT / GV / HCA / HHWSP / HWSC / WPN / DU	HHWSP / HWSC	2010-2014
	Erect creek crossing & ecological corridor signage along roadways.				HCA / CITY / RAP / WPN / BARC	CITY / WPN	2010-2014
	Implement education outreach programs for school-aged children, including: Yellow Fish Road, Stream of Dreams, Mini Marsh, Envirothon, Children's Water Festival, Eco-House Tours, etc.				BARC / HCA / CITY / GV / RBG	BARC / GV / HCA / CITY / RBG	2010-2014
	Support the formation and activities of "Friends of" groups aimed at protecting and rehabilitating natural features.				HWSC / HHWSP / CITY / HCA / BARC / FSRT / DFO / BTC	HHWSP / HWSC / HCA / CITY	2010-2014
		Assess landowner willingness to participate in and/or support water quality improvement and habitat restoration projects.			HHWSP / CITY / HCA / HWSC	HHWSP	2010-2012

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
		Engage citizen groups to conduct local subwatershed monitoring & reporting projects, including: water quality, base flow, litter hot spots, etc.			HHWSP / CITY / HCA / GV / BARC/ HWSC / RBG / FSRT	HHWSP / CITY / HCA / GV / BARC/ HWSC / RBG / FSRT	2010-2014
			Work with schools to undertake school yard naturalization projects.		HHWSP / HCA / CITY / HWSC	HHWSP	2010-2014
			Work with citizen groups to undertake restoration projects on public and private lands, including “Friends of” work days, Adopt a Creek, Fishing Clubs, etc.		HHWSP / HCA / CITY / HWSC / BARC / RBG / FSRT /BTC	HHWSP	2010-2014
Encroachment Map Code: EN Definition: The act of undertaking practices on another person’s property, i.e. erecting structures, planting gardens, disposal of waste.	Utilize workshops, information sessions, literature, websites, public service announcements, signage & direct landowner contact to promote healthy creeks to create awareness regarding how encroachment negatively impacts habitat.			HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55, 60	CITY / HHWSP / HCA / BARC / GV / HWSC / RBG / BTC	CITY / HCA / HHWSP / RBG	2010-2014
		Engage citizen groups to monitor & report areas affected by encroachment that are in need of restoration.		City of Hamilton Draft Private Tree and Woodland Conservation By-law	CITY / HHWSP / HCA / BARC / RBG / GV / HWSC / BTC	HCA / CITY / RBG	2010-2014
			Work with citizen groups to remove encroaching material on public and private lands, including “Friends of” work days, Adopt a Creek, Fishing Clubs, etc.	City of Hamilton By-law No. 03-117 Illegal Dumping	HHWSP / HCA / CITY / HWSC / BARC / GV / RBG / HNC	CITY / HHWSP / RBG / HCA	2010-2014
Erosion Map Code: ER Definition: The process of soil being scoured or washed away by flowing water.	Host erosion and sediment control training sessions for City staff, developers, contractors and landscapers to create awareness regarding recommended E&SC methods.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-2, ULM-3, FW-4 Pages 69, 70, 107	CITY / HCA / HHWSP / HWSC / Landscape Ontario / HHHBA	HCA	2010-2014
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy creeks and the importance of riparian buffers and agricultural BMP’s.			HCA Planning and Regulation Policies and Guidelines Pages 68-69 Fisheries Act, Section 35	CITY / DFO / HCA / HWSC / HHWSP / HHHBA / Landscape Ontario / OSCIA	HHWSP / HWSC	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
	Create demonstration sites on public lands that highlight streambank stabilization and natural channel design projects.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142, 159-160 Erosion and Sediment Control Guidelines for Urban Construction	CITY / HCA / HHWSP / DFO / HWSC / RBG / OSCIA	HHWSP	2010-2014
		Select erosion sites as identified in the City of Hamilton GRIDS Plan for the upcoming Erosion and Sediment Control Pilot Project.			HCA / CITY / HHHBA / DFO	HCA	2010-2014
			Work with landowners to undertake erosion rehabilitation projects as identified in the City of Hamilton GRIDS Plan.		HHWSP / HWSC / HCA / CITY / DFO /	CITY	2010-2014
			Utilize enforcement scheme to enforce appropriate erosion control measures on development sites, including: seeding, avoiding steep slopes, etc.		HCA / CITY / HHHBA / DFO	HCA	2010-2014
			Work with landowners to reduce erosion by implementing BMP projects; e.g. streambank stabilization, riparian buffers, natural channel design.		HHWSP / HWSC / HCA / BARC / DFO / OSCIA / FSRT	HHWSP	2010-2014
Faulty Septic Systems Map Code: SS Definition: Malfunctioning septic systems; including plugged distribution tiles, infrequent tank pumping, etc. lead to untreated sewage contaminating our ground and surface water.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the proper maintenance of existing septic systems.				HCA / BARC / HHWSP / HWSC / CITY	HHWSP	2010-2014
	Create demonstration sites on public lands that highlight properly functioning septic systems.				CITY / HHWSP / HCA / HWSC	CITY / HCA	2010-2012
		Conduct an inventory to determine how many households in Old Dundas are serviced by on-site treatment systems.			CITY / RAP	CITY	2010-2011
		Analyze existing water quality data for high levels of bacteria, chlorides, nitrates and TKN to prioritize areas for education outreach and restoration.			CITY / HCA / RAP	CITY / HCA	2010-2011

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
		Undertake a risk analysis of the potential for old and/or degraded sewer lines to contaminate groundwater.			CITY / MOE / RAP	CITY	2010-2011
			Work with landowners to properly maintain their septic systems or upgrade faulty septic systems.		HHWSP / CITY / HCA / HWSC / GV	HHWSP	2010-2014
Habitat Fragmentation Map Code: HF 	Establish a Woodlot Owners Association for this area as recommended by Re-Leaf Hamilton			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-12 Page 123 HCA Planning and Regulation Policies and Guidelines Pages 53-59 City of Hamilton Draft Private Tree and Woodland Conservation By-law Cootes to Escarpment Conservation & Land Management Strategy	HHWSP / HCA / HWSC / RBG / HNC / MNR	HWSC	2010
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy ecosystems and the importance of habitat connectivity.				HHWSP / HCA / RBG / CITY / HWSC / DU / MNR / HNC / CC	HHWSP / HWSC	2010-2014
	Encourage landowners to complete management plans for the natural features of their properties and to sustainably manage those features through the implementation of BMP's.				HHWSP / HCA / HWSC / CITY / HNC	HHWSP	2010-2014
	Create demonstration sites on public lands that highlight various types of terrestrial and aquatic habitat restoration projects.				HHWSP / HCA / CITY / HWSC / RBG / DU / HNC / DFO / FSRT	HHWSP	2010-2014
		Develop How Much Habitat is Enough targets for each subwatershed.			HCA / CITY/ HHWSP / DU / CC / HWSC / RBG / MNR / DFO	HCA	2010-2014
			Work with landowners to undertake habitat creation and enhancement projects.		HHWSP / OSCIA / DU / HWSC / HCA / DFO / FSRT	HHWSP	2010-2014
Illegal Fill Placement Map Code: FP Definition: The act of	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the adverse effects of “fill” on natural systems and promote compliance with the HCA Regulations and the City’s Site Alteration By-law.			HCA Planning and Regulation Policies and Guidelines Pages 61-62 City of Hamilton By-law No. 03-117 Illegal Dumping	HHWSP / HWSC / HCA / CITY	HCA	2011

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
dumping fill material into or adjacent to natural areas.	Host a training session for HCA and City staff on how to identify illegal fill and how to report incidences.				HCA / CITY / DFO	HCA	2010
			Work with landowners to rehabilitate fill sites as recommended by the HCA Inventory.		HCA / CITY / HHWSP / DFO	HCA	2012-2014
Inadequate Stormwater Management Map Code: SWM  Definition: Inadequately managing stormwater to control water quality and flooding; often associated with the drainage of developed lands.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote stormwater management BMP's including: disconnected downspouts, roof gardens, rain barrels, biofilters, permeable pavement, rain gardens, etc.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM -6, ULM-9, ULM-11 Pages, 72, 75, 77 HCA Planning and Regulation Policies and Guidelines Pages 74-77 Fisheries Act, Section 34 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 38-44, 93-97, 122-125, 158-162	GV / CITY / BARC	CITY	20102014
	Promote the use of constructed wetland technology and Low Impact Development in the design of stormwater management facilities.						
		Undertake a study to determine the percentage of landowners with connected downspouts.			CITY / GV / RAP / BARC	CITY	2010-2011
			Implement recommendations from the City of Hamilton Stormwater Master Plan.		CITY / HCA / RAP / BARC / GV	CITY	2010-2014
			Work with landowners to disconnect downspouts and install rain barrels.		CITY / HHWSP / BARC / GV	CITY	2010-2014
			Retrofit existing stormwater management ponds to wet ponds where beneficial to water quality, aquatic habitat and erosion control.		CITY / RAP / HCA	CITY	2010-2014
			Offer financial incentives to replace driveways and decks with permeable pavement, interlocking brick, etc.		CITY	CITY	2010-2011
Increased Impervious Surfacing Map Code: IS	Host training sessions for HCA and City staff, developers and consultants to promote the incorporation of development related BMP's into planning applications; e.g. permeable pavement, green roofs, on-site wastewater treatment, etc.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM -5b, ULM-6 Page 71, 72 HCA Planning and Regulation Policies	HCA / CITY / HHHBA / Landscape Ontario	HCA / CITY	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
 Definition: The decreased potential for rainwater infiltration into the soil as a result of increased paved/impermeable surfacing.	Lobby the Provincial government to amend the building code to include and favour “green” technology; e.g. green roofs, multilevel parking, interlocking pavement, etc.			and Guidelines Pages 74-77 Fisheries Act, Section 34	HCA / CITY / EH / HHHBA / GV / Landscape Ontario	CITY	2010-2014
	Create demonstration sites in subdivisions that highlight development related BMP’s and new environmentally friendly technologies; e.g. permeable pavement, green roofs, on-site wastewater treatment, etc.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 38-44, 93-97, 122-125, 158-162	HCA / CITY / EH / HHHBA / GV / HHWSP / HWSC	HHHBA	2010-2014
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the implementation of development related BMP’s and new environmentally friendly technologies when undertaking home renovations.				HCA / CITY / GV / HHHBA / HHWSP	GV	2010-2014
Invasive/Introduced Species Map Code: IV Definition: The establishment/proliferation of exotic species that have no natural control measures which compete with native species for resources and degrade the ecosystem.	Host training sessions for City staff, landscapers, consultants and nurseries to create awareness regarding the detrimental effects of invasive species and to encourage the use of native species.			HCA Planning and Regulation Policies and Guidelines Pages 53-56, 70-71 Action Plan for Addressing Terrestrial Invasive Species within the Great Lakes Basin	HHWSP / HCA / HWSC / CITY / HNC / Landscape Ontario	HCA	2010-2011
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the importance of controlling invasive species and planting native species.				HHWSP / HCA / HWSC / CITY	HHWSP	2010-2014
		Develop an Invasive Species Management Program which includes monitoring sites and management for specific species.			HCA / HHWSP / MNR / HWSC / CITY / HNC / RBG / CC	HCA	2010-2013
			Work with landowners to control invasive species and plant native species.		HCA / CITY / HHWSP / RBG	HHWSP	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Insufficient Riparian Buffer Map Code: RB  Definition: Disruption of large continuous tracts of habitat along watercourses.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and the creation of larger riparian buffers.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-2 Page 69	DFO / HCA / HHWSP / BARC / HWSC / OSCIA / OMAFRA	HHWSP	2010-2014
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.			HCA Planning and Regulation Policies and Guidelines Pages 40, 55, 60	HCA / HHWSP / HWSC / OSCIA / OMAFRA	OSCIA	2010-2014
	Create demonstration sites that highlight riparian buffers.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 145-150, 162-163	DFO / HCA / HHWSP / BARC / HWSC / OSCIA / OMAFRA	HHWSP	2010-2012
			Work with landowners to naturalize and plant riparian buffers adhering to How Much Habitat is Enough guidelines of a15m width adjacent to warm water streams and a 30m width adjacent to cold and cool water streams.	Cootes to Escarpment Conservation & Land Management Strategy	HCA / HHWSP / HWSC / OSCIA / FSRT / DFO	HHWSP / OSCIA	2010-2014
Litter Map Code: LI Definition: The act of illegally disposing of waste into public/natural areas.	Utilize literature, websites, public service announcements, & direct landowner contact to create awareness regarding the prevention and clean-up of litter.			City of Hamilton By-law No. 03-118 Litter, Yard Waste and Property Maintenance	HCA / RBG / CITY / GV	CITY	2010-2014
		Undertake an inventory of illegal dumping sites throughout the subwatershed. Prioritize sites for the installation of deterrent mechanisms and the implementation of the Keep Hamilton Clean Program.			HCA / CITY / RBG	CITY	2010-2014
			Participate in the Keep Hamilton Clean Program by working with citizen groups to host litter clean up events.		HCA / HHWSP / HWSC / RBG / CITY	CITY	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Nutrient Loading Map Code: NL  Definition: Excessive nutrients being inputted into a watercourse; often resulting from the application of manure/fertilizer.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and BMP's related to nutrient management.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-9, RM-7. Pages 116, 158 Nutrient Management Act 2002, O. Reg 267/03 Fisheries Act, Section 34 HCA Planning and Regulation Policies and Guidelines Page 72	HCA / BARC / GV / RBG / OSCIA / MOE / OMAFRA / RAP	HCA	2010-2014
	Create demonstration sites on public lands that highlight nutrient management BMP projects.				HCA / HHWSP / HWSC / OSICA / RAP	HHWSP	2010-2012
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.				DFO / HCA / OMAFRA / OSCIA / HHWSP / HWSC	OSCIA	2010-2014
		Establish a nutrient level monitoring program with strategic sampling sites that are land use dependent, to identify specific sources of nutrient loading.			HCA / CITY / BARC / RBG / MOE / OMAFRA / RAP	HCA	2010-2011
		Develop a plan to reduce nutrient levels as determined by the land use dependent nutrient level monitoring program.			HCA / CITY / BARC / RBG / DFO / OSCIA / HHWSP / HWSC / RAP	HCA	2012-2014
			Work with landowners to reduce nutrient loading by implementing agricultural and urban BMP's related to nutrient management.		HHWSP / OSCIA / HCA / CITY / OMAFRA / HWSC	HHWSP	2010-2014
On-line Ponds Map Code: OP	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and pond retrofit options.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-1, FW-4 Page 104, 107	DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY	HHWSP	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
<p>Definition: An in-stream structure designed to impound stream flow; leads to increased in-stream temperatures downstream and is often a barrier to fish migration.</p>			Work with landowners to restore or retrofit on-line ponds.	Fisheries Act, Section 37 HCA Planning and Regulation Policies and Guidelines Page 63	DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY / HWSC	HHWSP	2010-2014
<p>Outdoor Recreation Related Impacts</p> <p>Map Code: OR</p>  <p>Definition: Recreational activities occurring in natural areas that inadvertently degrade the natural features of the area.</p>	Support the formation and activities of “Friends of” groups aimed at protecting and rehabilitating natural features.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-8, PAA-1, PAA-2, PAA-3 Pages 115, 126-130 The Conservation Lands of Ontario – Three Year Business Plan A Joint Outdoor Tourism Marketing Strategy Niagara Escarpment Access Enhancement Plan Dundas Valley 50 Year Vision Strategy Cootes to Escarpment Conservation & Land Management Strategy	HWSC / HHWSP / CITY / HCA / BARC / FSRT / BTC	HHWSP / CITY / HCA / RBG	2010-2014
	Erect signage explaining the environmental significance of natural areas and promoting user “etiquette” for the area.				HCA / CITY / RBG / HHWSP / HNC / BTC	HCA / RBG / CITY	2010-2014
	Add “tread lightly” messaging to our recreation oriented websites.				HCA / CITY / RBG / HNC / BTC	HCA / CITY / RBG / HNC / BTC	2010-2012
		When undertaking master planning exercises, design trails to meet guidelines as set in HCA’s Planning and Regulation Policies and Guidelines.			HCA / CITY / RBG	HCA / CITY / RBG	2010-2014
		Develop marketing strategies for sensitive lands that focus on sustainable use.			HCA / CITY / RBG	HCA / CITY / RBG	2010-2012
		Continue to monitor Category A and B waterfalls on public lands for signs of degradation.			HCA / CITY	HCA / CITY	2010-2014
		Refer to the Niagara Escarpment Access Enhancement Plan to design infrastructure for high traffic areas to guide users along approved trails.			HCA / CITY / RBG / BTC	HCA / CITY / RBG / BTC	2010-2014
			Host annual clean up days for natural areas identified as having excessive amounts of litter.		HCA / RBG / CITY / HHWSP / HWSC / HNC / BARC	CITY / HCA / RBG	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
			Increase the amount of poison ivy caution signage along trails and in areas known to be degraded by trespassing.		HCA / CITY / RBG / HNC / BTC	HCA / CITY / RBG	2010-20111
			When conducting maintenance of existing trails, seek guidance from the HCA Planning and Engineering Department with respect to materials and design.		HCA / CITY / HHWSP / RBG / HNC	HCA / CITY / RBG	2010-2014
Perched Culverts Map Code: CP Definition: In-stream culverts that when improperly designed/installed, create barriers to water flow and fish migration.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and create awareness regarding the detrimental effects of perched and closed bottom culverts.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-1, FW-4 Pages 104, 107 Fisheries Act, Section 37 HCA Planning and Regulation Policies and Guidelines Page 41	DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY	HHWSP	2010-2014
	Host training session for HCA and City staff to promote the proper installation of culverts.				DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY	CITY	2010-2014
		Undertake an inventory of perched and closed bottom culverts throughout the subwatershed. Prioritize culverts for mitigation or replacement.			DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY	CITY	2010-2014
			Work with landowners to remove/retrofit perched and closed bottom culverts.		DFO / HCA / OSCIA / OMAFRA / HHWSP / CITY	HHWSP	2010-2014
Pesticide Use Map Code: PS 	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the detrimental effects of pesticides and herbicides and alternatives.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations TSSR-6, EPI-4 Pages 99, 137 Fisheries Act, Section 34 City of Hamilton By-Law No. 07-282	HCA / OSCIA / OMAFRA / HHWSP / CITY / GV / HCPI / Landscape Ontario	GV	2010-2014
	Host Audubon Cooperative Sanctuary Program information sessions for local golf course owners and managers.				HHWSP / Landscape Ontario / CITY / HWSC / HCPI / RCGA	HHWSP	2010-2011
	Promote Municipal and Provincial Pesticide By-Laws.				CITY / GV / HCPI / HWSC / HHWSP / OSCIA / OMAFRA	CITY / GV	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Definition: The application of pesticides to control perceived pests.	Create demonstration sites on public lands that highlight pesticide/herbicide free lawns, gardens, natural areas, crops, etc.				CITY / GV / HCPI / HWSC / HHWSP / OSCIA / OMAFRA	HHWSP	2010-2014
		Undertake a study to determine the current level of pesticide/herbicide use in the subwatershed and develop targets for reduction.			CITY / GV / HCPI / HWSC / HHWSP / OSCIA / OMAFRA	CITY	2010-2012
			Work with landowners to implement Integrated Pest Management practices as alternatives to pesticide use.		CITY / GV / HCPI / HWSC / HHWSP / OSCIA / OMAFRA	HHWSP	2010-2014
Plowed Watercourses Map Code: PW Definition: Headwater swales or small watercourses that are worked for agricultural production.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote drainage related BMP's; e.g. Water and Sediment Control Basins and grassed waterways.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-3, ULM-4 Pages 70, 71, Fisheries Act, Section 37	DFO / HCA / OMAFRA / OSCIA / HHWSP / HWSC	HHWSP / OSCIA	2010-2014
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.				DFO / HCA / OMAFRA / OSCIA / HHWSP / HWSC	OSCIA	2010-2014
	Create demonstrations sites that highlight BMP's that promote good agricultural land drainage; e.g. grassed waterways, Water and Sediment Control Basins, etc.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 44, 145-150	DFO / HCA / OMAFRA / OSCIA / HHWSP / HWSC	HHWSP / OSCIA	2010-2012
			Work with landowners to install effective agricultural land drainage; e.g. grassed waterways, Water and Sediment Control Basins, etc.		DFO / HCA / OSCIA / HHWSP / HWSC	HHWSP / OSCIA	2010-2014
Sediment Loading Map Code: SL	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and BMP's related to preventing sedimentation.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-3, ULM-5, FW9 Pages 70, 71, 116 Fisheries Act, Sections 34	DFO / HCA / HHWSP / BARC / HWSC / RBG / FSRT / RAP	HCA	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Definition: Organic and inorganic material that is entrained by the flow of water and is deposited in a creek system.			Work with landowners to reduce sediment loading by implementing BMP projects; e.g. streambank stabilization, riparian buffers, natural channel design.	and 36 Erosion and Sediment Control Guidelines for Urban Construction	DFO / HCA / HHWSP / BARC / HWSC / OSCIA / FSRT / RAP	HHWSP	2010-2014
			Utilize an enforcement scheme to ensure the proper use of sediment control measures, including: silt fencing, etc.		DFO / HCA / HHHBA/ CITY		
			Work with contractors to ensure that site clearing prior to development is phased out as the project phases unfold to reduce the area and length of time bare soil is exposed.		CITY / HCA/ HHHBA / DFO	HCA	2010-2014
Site Clearing Prior to Development Map Code: SC 	Host training sessions for City staff, developers and consultants to promote City standards and guidelines related to site preparation prior to development.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-4 Page 71	DFO / HCA / HHHBA / CITY / Landscape Ontario	CITY	2011-2012
			Work with contractors to ensure that only necessary areas of development sites are cleared prior to development to eliminate the unnecessary destruction of habitat.	HCA Planning and Regulation Policies and Guidelines Pages 50-62, 68-69 City of Hamilton Draft Private Tree and Woodland Conservation By-Law City of Hamilton By-Law No. 03-126 Site Alteration By-Law Erosion and Sediment Control Guidelines for Urban Construction	CITY / HCA / HHHBA / DFO	HCA	2010-2014
Definition: The act of stripping or excavating the vegetation and topsoil from a site prior to construction works.							

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Stormsewer Outfalls Map Code: SO  Definition: The point where a sewer system discharges into a watercourse during a storm event.	Implement the Stream of Dreams and Yellow Fish Road Programs with local schools, scouting and girl guide groups and other children's groups, to create awareness regarding the impacts of stormwater on stream systems.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM -6, ULM-9, ULM-11, RM-7 Pages, 72, 75, 77, 158 Fisheries Act, Section 34 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 138, 158-159	HCA / BARC / GV / CITY / HWSC / FSRT	BARC	2010-2014
	Promote the Municipal Sewer-Use By-law.				HCA / CITY / GV / FSRT / BARC	CITY	2010-2014
		Undertake a water quality study evaluating water quality and temperature at a representative sampling of storm sewers to prioritize sewersheds to target for education outreach and remediation.			HCA / BARC / RAP / CITY / GV	CITY	2010-2012
		Undertake a water temperature monitoring study at a representative sampling of storm sewers to determine the impact of storm flows on creek temperature.			HCA / CITY / DFO	HCA	2010-2012
			Work to implement the recommendations in the sewershed water quality study.		HCA / RAP / CITY / DFO	CITY	2012-2014
			Work with landowners to establish riparian buffers and/or erosion protection downstream of storm sewer outfalls; e.g. riverstone.		HCA / CITY / HHWSP / BARC / FSRT	HHWSP	2010-2014
			Work with landowners to disconnect downspouts and to install rain barrels.		HHWSP / GV / CITY BARC	GV	2010-2014
Runoff Contamination via Transportation Corridors Map Code: TC Definition: Contamination resulting from stormwater runoff from major arterial roadways; often associated	Liaise with City staff to promote road salt alternatives, alternative application methods and recommended snow removal practices. E.g. City of Guelph liquid application prior to inclement weather.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-5b Page 71 Fisheries Act, Section 34	CITY / DFO / HCA / MTO	CITY / HCA	2010-2014
	Utilize literature, websites, public service announcements & direct landowner contact to promote the use of sidewalk salt alternatives.				CITY / DFO / HCA / MTO / GV / HWSC / HHWSP	GV	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
with the application of salts for de-icing and the residual precipitate created by automobile exhaust.		Undertake a study to determine the most effective method of snow removal that will reduce contamination of watercourses.			CITY / DFO / HCA / MTO	CITY	2010-2012
			Implement improved snow removal methods as recommended by the study that will reduce contamination of watercourses.		CITY / MTO	CITY	2012-2014
			Install vegetated filter strips and riparian buffers along medians and roadsides.		CITY / HCA / MTO / DFO / RAP	CITY	2010-2014
Transportation Corridor Expansion Map Code: TE Definition: The process by which new roads are built or existing roads are widened.	Host training sessions for City staff, developers and consultants to promote BMP's and new environmental technologies relating to transportation corridors; e.g. permeable pavement, wildlife under/overpasses, vegetated filter medians and rights of way, light coloured aggregate in hot mix, etc.			HCA Planning and Regulation Policies and Guidelines Pages 50-62, 68-69 Ontario Provincial Standards for Roads and Public Works Erosion and Sediment Control Guidelines for Urban Construction	CITY / HCA / MTO / HHHBA	CITY	2010-2014
		When planning for major road works, design transportation corridors using new technologies for environmental solutions.			CITY / HCA / MTO / HHHBA	CITY	2010-2014
			When repairing roads, utilize new technologies for road maintenance that are proven to have environmental benefits.		CITY / HCA / MTO / HHHBA	CITY	2010-2014
Water Takings Map Code: WT	Host open houses when experiencing low water conditions to address landowner concerns and promote recommended reductions in rates and volumes of takings.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-12 Page 77 Ontario Water Resources Act O. Reg. 387/04	HCA / MOE / CITY	HCA	2010-2014
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote BMP's relating to water conservation technology.				HCA / MOE / CITY / OMAFRA / OSCIA / HHWSP / HWSC	HHWSP	2010-2014
	Encourage landowners with surface water takings to install groundwater systems.				HHWSP / OSCIA / MOE / OMAFRA	HHWSP	2010-2014

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS


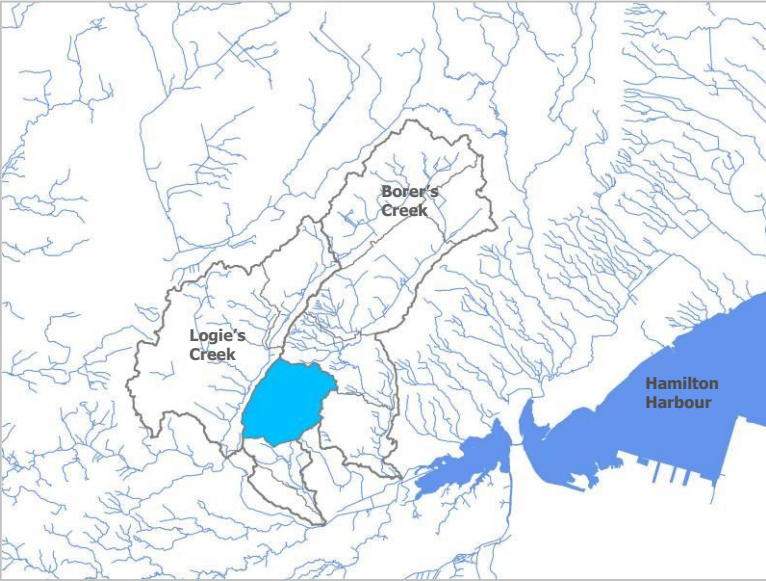
STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
 <p>Definition: The process by which surface and groundwater are pumped out of the natural system; for the purposes of irrigation, aggregate extraction, etc.</p>	Encourage landowners with water taking needs to establish an Irrigation Advisory Committee to schedule takings alternately.				HHWSP / OSCIA / MOE / OMAFRA	OMAFRA	2010-2014
		Upon receipt of new Permit to Take Water applications, evaluate the taking against active permits in the area to determine the potential stress level related to multiple users on a given system.			HCA / MOE / CITY	HCA	2010-2014
			Work with landowners to implement BMP's related to water conservation.		HCA / OSCIA / CITY / HWSC / HHWSP / OMAFRA	OSCIA	2010-2014
			Work with landowners to decommission unused wells.		HCA / HHWSP / OSCIA / CITY	HHWSP	2010-2014
<p>Wildlife Collisions</p> <p>Map Code: WC</p> <p>Definition: Incidences where animals are struck by vehicles or where animals collide with buildings, often occurring with buildings with large windows.</p>	Utilize literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding managing human-wildlife conflicts.				CITY / MNR / HHWSP / HWSC / HCA	MNR	2010-2014
	Erect additional wildlife caution signage that is species specific, along roadways at known points of frequent collisions.				CITY / HCA / RBG / MTO	CITY / MTO	2010-2014
		When planning major road works, consider the incorporation of wildlife over/underpasses, avoiding known migratory corridors and other wildlife accommodations in the design.			CITY / HCA / MTO	CITY	2010-2014
		Evaluate the effectiveness of the MTO roadside prairies and wildlife shrub corridors project in preventing wildlife collisions.			CITY / HCA / MTO	MTO	2010-2012

TABLE SY-8: STRESSES AND STEWARDSHIP ACTIONS

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
			Reduce the use of road salt or consider alternatives that do not attract wildlife.		CITY / HCA / MTO	CITY	2010-2011
			Produce and distribute window decals for large windows of homes and high rise buildings to prevent bird collisions.		CITY / HCA / HNC / GV	CITY	2010-2011

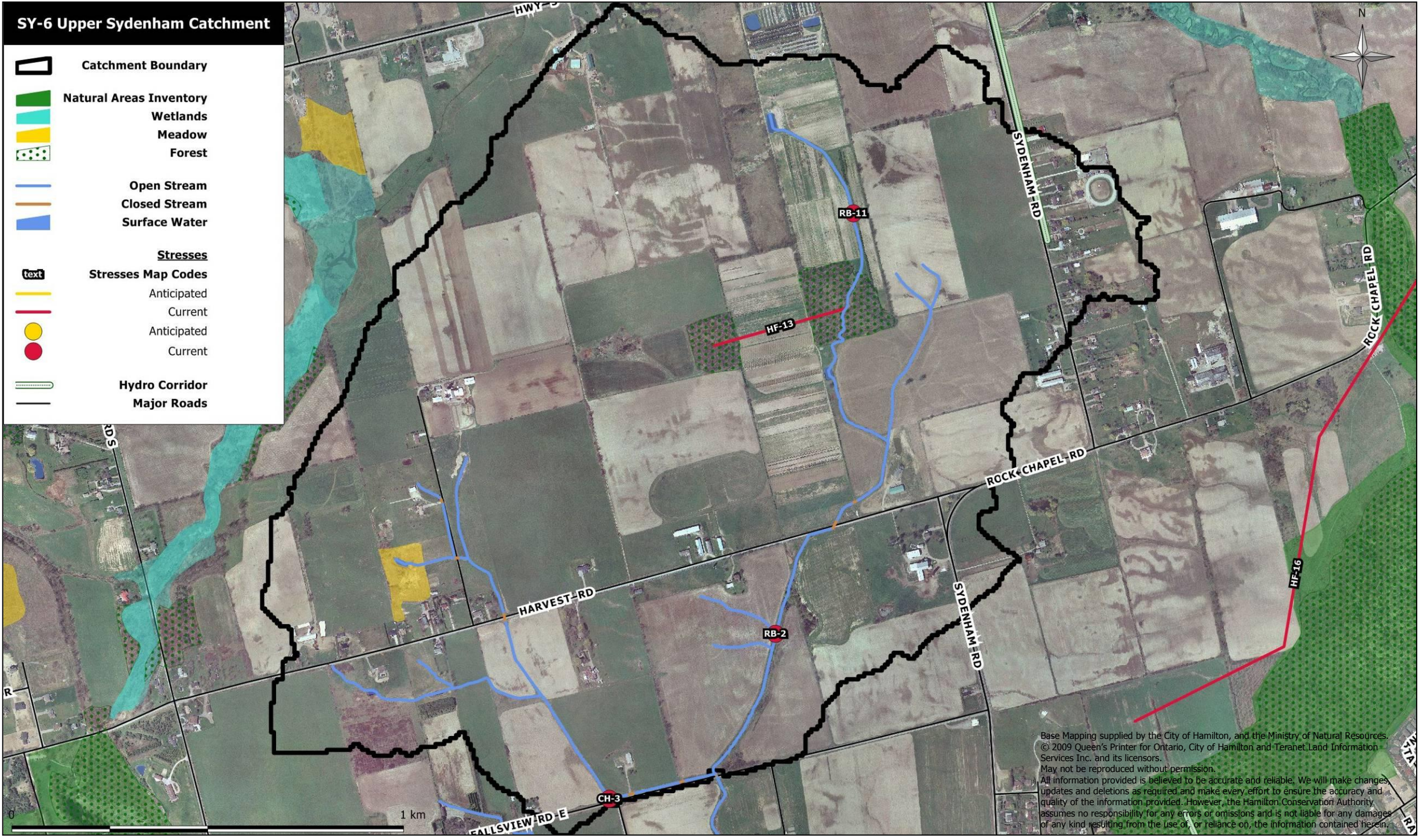
Partner Agency Acronyms

BARC	Bay Area Restoration Council	HHHBA	Hamilton-Halton Home Builders Association
BTC	Bruce Trail Conservancy	HHWSP	Hamilton-Halton Watershed Stewardship Program
CC	Carolinian Canada	HNC	Hamilton Naturalists Club
CITY	City of Hamilton	HWSC	Hamilton-Wentworth Stewardship Council
DFO	Department of Fisheries and Oceans	MOE	Ministry of the Environment
DU	Ducks Unlimited	MNR	Ministry of Natural Resources
EH	Environment Hamilton	MTO	Ministry of Transportation
FSRT	Field and Stream Rescue Team	OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
GV	Green Venture	OSCIA	Ontario Soil and Crop Improvement Association
HCA	Hamilton Conservation Authority	WPN	Watershed Planning Network
HCPI	Hamilton Coalition on Pesticide Issues		



UPPER SYDENHAM CATCHMENT

DATA SHEETS



UPPER SYDENHAM DATA SHEET

Table SY-9: Stresses Identified in the Upper Sydenham Catchment

CURRENT STRESSES	DESCRIPTION	STEWARDSHIP ACTIONS			PUBLIC LAND	PRIVATE LAND	DFO COMP PROJECT POTENTIAL
		AWARENESS OPPORTUNITY	SPECIAL STUDY OPPORTUNITY	RESTORATION OPPORTUNITY			
CH-3	Channelization	☑	☑	☑		☑	☑
HF-13	Habitat Fragmentation	☑	☑	☑		☑	
RB-11	Insufficient Riparian Buffer	☑		☑		☑	
RB-2	Insufficient Riparian Buffer	☑		☑		☑	

UPPER SYDENHAM DATA SHEET

FISHERIES ASSESSMENT

LOCATION	DATE	DESCRIPTION
n/a		

BENTHICS ASSESSMENT

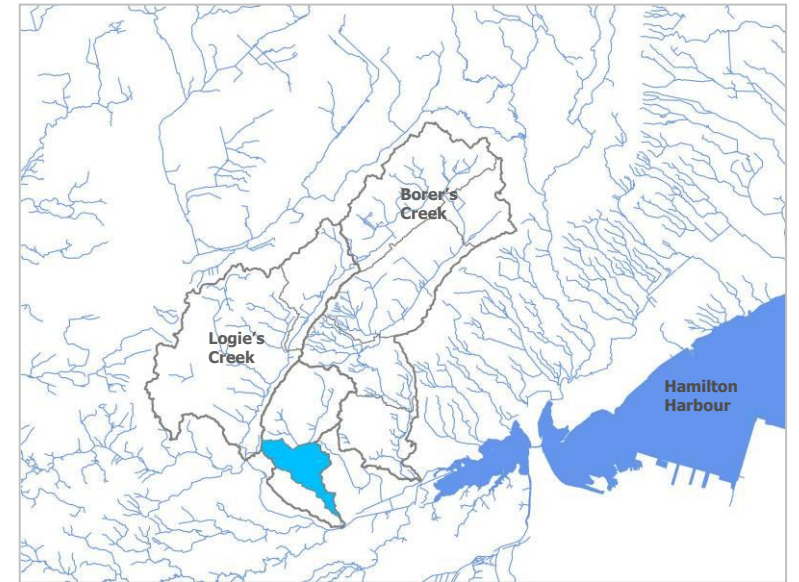
LOCATION	DATE	DESCRPTION
n/a		

WATER QUALITY ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		

WATER FLOW ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		



MIDDLE SYDENHAM CATCHMENT

DATA SHEETS

MIDDLE SYDENHAM DATA SHEET

Table SY-10: Stresses Identified in the Middle Sydenham Catchment

CURRENT STRESSES	DESCRIPTION	STEWARDSHIP ACTIONS			PUBLIC LAND	PRIVATE LAND	DFO COMP PROJECT POTENTIAL
		AWARENESS OPPORTUNITY	SPECIAL STUDY OPPORTUNITY	RESTORATION OPPORTUNITY			
BS-2	Buried Stream	☑	☑	☑	☑	☑	☑
CH-2	Channelization	☑	☑	☑	☑	☑	☑
EN-5	Encroachment	☑	☑	☑	☑	☑	
ER-24	Erosion	☑	☑	☑	☑	☑	☑
ER-25	Erosion	☑	☑	☑	☑	☑	☑
IS-5	Increased Impervious Surface	☑			☑	☑	
OR-10	Outdoor Recreation Related Degradation	☑	☑	☑		☑	
OR-11	Outdoor Recreation Related Degradation	☑	☑	☑		☑	
OR-12	Outdoor Recreation Related Degradation	☑	☑	☑		☑	
OR-13	Outdoor Recreation Related Degradation	☑	☑	☑		☑	
SO-37	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-48	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-62	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-63	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-64	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-64	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-66	Stormsewer Outfall	☑	☑	☑	☑	☑	
SO-67	Stormsewer Outfall	☑	☑	☑	☑	☑	
TC-7	Runoff Contamination via Transportation Corridors	☑	☑	☑	☑	☑	

MIDDLE SYDENHAM **DATA SHEET**

FISHERIES ASSESSMENT

LOCATION	DATE	DESCRIPTION
n/a		

BENTHICS ASSESSMENT

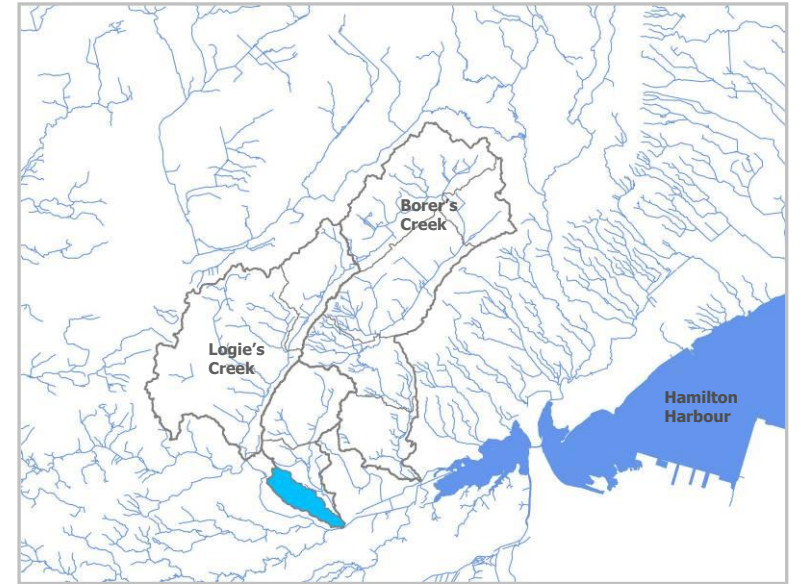
LOCATION	DATE	DESCRPTION
n/a		

WATER QUALITY ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		

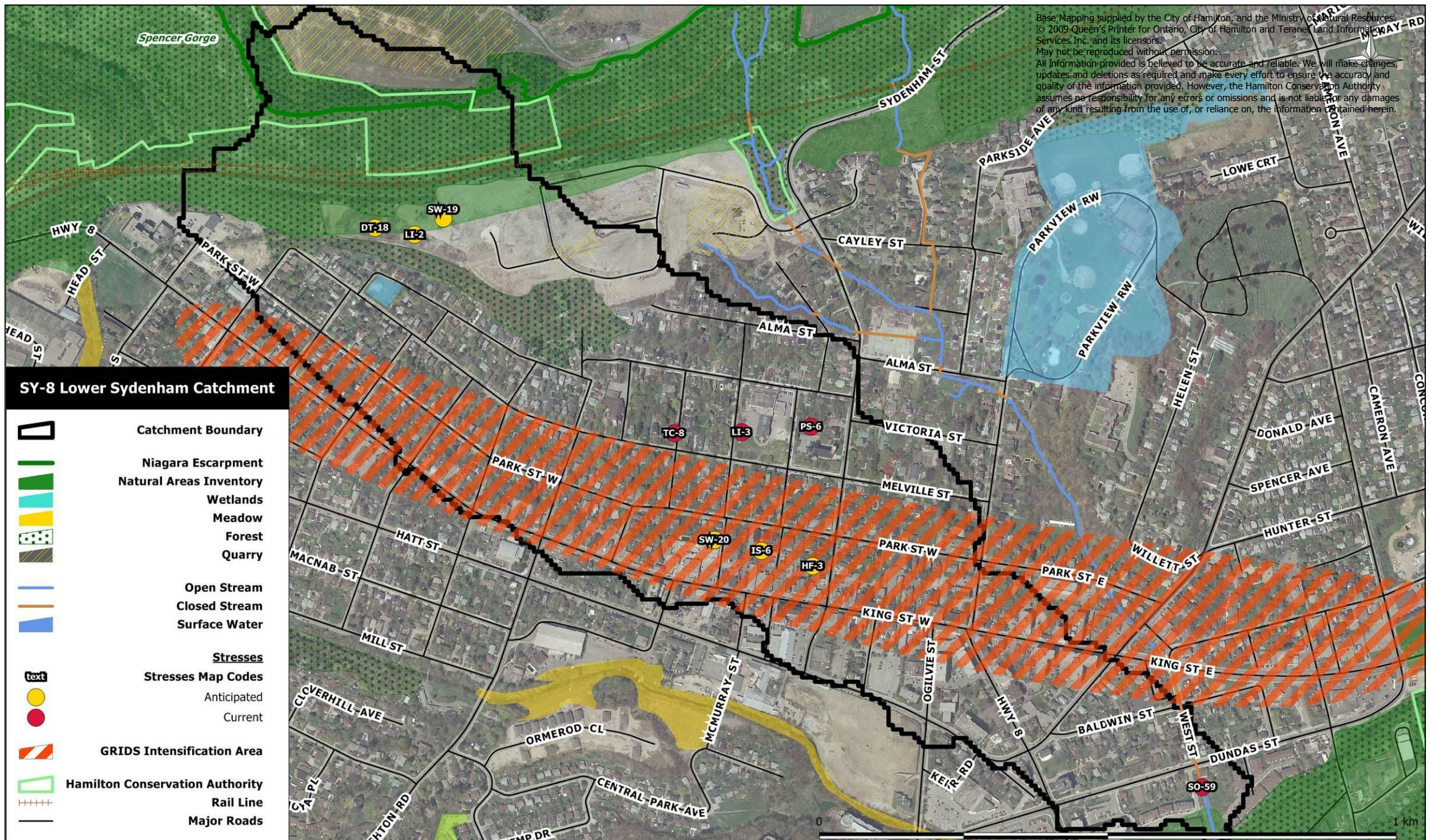
WATER FLOW ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		



LOWER SYDENHAM CATCHMENT

DATA SHEETS



LOWER SYDENHAM DATA SHEET

Table LO-10: Stresses Identified in the Lower Sydenham Catchment

CURRENT STRESSES	DESCRIPTION	STEWARDSHIP ACTIONS			PUBLIC LAND	PRIVATE LAND	DFO COMP PROJECT POTENTIAL
		AWARENESS OPPORTUNITY	SPECIAL STUDY OPPORTUNITY	RESTORATION OPPORTUNITY			
DT-18	Detachment From Nature	☑	☑	☑		☑	
HF-3	Habitat Fragmentation	☑	☑	☑	☑	☑	
SW-19	Inadequate Stormwater Management	☑	☑	☑		☑	
SW-20	Inadequate Stormwater Management	☑	☑	☑	☑	☑	
IS-6	Increased Impervious Surface	☑			☑	☑	
LI-2	Litter	☑	☑	☑		☑	
LI-3	Litter	☑	☑	☑	☑	☑	
PS-6	Pesticide Use	☑	☑	☑		☑	
TC-8	Runoff Contamination via Transportation Corridors	☑	☑	☑		☑	
SO-59	Stormsewer Outfall	☑	☑	☑	☑	☑	

LOWER SYDENHAM **DATA SHEET**

FISHERIES ASSESSMENT

LOCATION	DATE	DESCRIPTION
n/a		

BENTHICS ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		

WATER QUALITY ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		

WATER FLOW ASSESSMENT

LOCATION	DATE	DESCRPTION
n/a		

