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## MIDDLE SPENCER, WESTOVER AND WEST SPENCER CREEKS STEWARDSHIP ACTION PLANS

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Part of the Spencer Creek Stewardship Action Plan 2011



Endorsed by the HCA Board of Directors March 2011



STEWARDSHIP ACTION PLANS: Middle Spencer, Westover and West Spencer Creeks  
*Part of the Spencer Creek Stewardship Action Plan*  
March 2011

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## ACKNOWLEDGEMENTS

The Hamilton Conservation Authority would like to extend its thanks to the individuals and organizations that provided representation for the Middle Spencer, Westover and West Spencer Creeks Stakeholders Advisory Committee. These individuals guided and provided valuable input into the development of these plans.

### MIDDLE SPENCER, WESTOVER AND WEST SPENCER CREEKS STAKEHOLDERS ADVISORY COMMITTEE MEMBERS

<i>Name</i>	<i>Representation</i>	<i>Position (if applicable)</i>
Darren Kenny	Hamilton Conservation Authority, Planning	Watershed Officer
Dianne Crosbie	HCA, Watershed Management Advisory Board	n/a
Gary Aikema	Citizen	n/a
Gavin Smuk	Hamilton-Wentworth Federation of Agriculture	Director
H.T. Lam	City of Hamilton, Operations and Waste Management	Senior Program Manager
John Hall	Hamilton Harbour Remedial Action Plan	Coordinator
Kevin McGill	Trout Unlimited	Member
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Lorraine Norminton	Hamilton-Wentworth Stewardship Council (Ministry of Natural Resources)	Coordinator
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Sheila O'Neal	Hamilton-Halton Watershed Stewardship Program	Program Manager
Tys Theysmeyer	Royal Botanical Gardens	Head of Conservation Science



Without the support and continued commitment to the Spencer Creek watershed from the above-noted individuals and organizations, these plans would not be possible and the implementation of these plans would not become a reality.



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## EXECUTIVE SUMMARY

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Environmental organizations in the subwatersheds of Spencer Creek have a growing need for a clear direction and a coordinated effort among all stakeholders to implement stewardship activities. Stewardship is the act of managing our natural environment in a sustainable manner, to maintain it in a healthy state for today and for future generations.

Numerous organizations have been working diligently within these watersheds for decades without complementary workplans, measurable targets or a coordinated implementation effort. In the absence of a coordinated effort, each of the organizations will continue working without capitalizing on their collective potential to effect positive environmental change on the landscape.

In 2007, the Hamilton Conservation Authority lead the development of the Spencer Creek Stewardship Action Plan initiative to engage partners and the public in a coordinated effort to develop and implement Stewardship Action Plans for each of the subwatersheds of Spencer Creek.

In the fourth year of the initiative, local stakeholders have jointly developed comprehensive Action Plans for the Middle Spencer, Westover and West Spencer Creek subwatersheds of Spencer Creek. These plans will serve as a guide for local partners in the implementation of stewardship actions, capitalizing on the strengths of existing partner agencies. The coordinated effort to develop and to implement these plans will ensure efficient and effective action on the part of all organizations involved.

The Plans include detailed:

- characterizations of each subwatershed,
- descriptions of environmental stresses and associated Stewardship Actions,
- subwatershed maps depicting the specific locations of stresses, and
- ecological and water quality monitoring data for each catchment.

Stakeholder input and Geographic Information Systems (GIS) analysis yielded the identification of environmental stresses, both natural and human-induced, within the study area.

- 38 types of stresses were identified as impacting our natural environment on a subwatershed scale .
- 1022 specific occurrences of stresses were identified at locations throughout the subwatersheds, 646 are in Middle Spencer Creek, 118 in Westover Creek and 260 in West Spencer Creek. The high number of stresses identified in these subwatersheds compared with previous Stewardship Action Plans developed for other subwatersheds within Spencer Creek can be attributed to improved riparian buffer mapping which now allows for all segments of creek where no buffer exists to be identified.
- Inventories of these occurrences are outlined in Tables 1 through 3 on pages ii and iii of this summary. Refer to these Stress Inventory Tables for statistics on the types and numbers of each stress identified within each subwatershed.
- The stresses are listed in descending order from the most prevalent to the least prevalent. Insufficient riparian buffers, water takings and online ponds are commonly ranked as the most prevalent stresses in all three subwatersheds.
- 208 Stewardship Actions have been identified to mitigate the impacts of these stresses, including education and outreach opportunities, special study opportunities and restoration opportunities. Refer to the Stewardship Actions for Middle Spencer, Westover and West Spencer Creeks Subwatersheds Summary Table on pages iv – xxx for detailed descriptions of each Stewardship Action.

Partners identified in the Middle Spencer, Westover and West Spencer Creeks Stewardship Action Plans are encouraged to join the Healthy Hamilton Watersheds Action Plan Implementation Team where they will use new and existing programs to undertake the Stewardship Actions identified in the plans. The Implementation Team will be an ongoing coordinating body for the implementation of the Stewardship Action Plans for the Spencer Creek, Red Hill Creek and Stony/Battlefield Creek watersheds as they are completed on a subwatershed basis through to 2013. Local businesses and residents are encouraged to work with the Implementation Team to undertake stewardship projects within their communities.

**EXECUTIVE SUMMARY – STRESS INVENTORY TABLES**

**TABLE 1 MIDDLE SPENCER CREEK SUBWATERSHED  
646 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	448
Water Taking	WT	44
Stormsewer Outfall	SO	40
Online Pond	OP	38
Abandoned Groundwater Wells	GW	28
Habitat Fragmentation	HF	13
Dam (Weir)	DM	7
Land Maintenance Practices	LM	6
Outdoor Recreation Related Impacts	OR	6
Migration Barrier	MB	5
Sediment Loading	SL	2
Fluctuating Water Level	WL	2
Nutrient Loading	NL	2
Channelization	CH	1
Inadequate Stormwater Management	SW	1
Perched Culvert	CP	1
Transportation Corridor Expansion	TE	1
Utility Pipeline	UP	1
Buried Stream	BS	none identified
Combined Sewer Overflow	CSO	none identified
Debris Jam	DJ	none identified
Detachment from Nature	DT	none identified
Development	DV	none identified
Encroachment	EN	none identified
Erosion	ER	none identified
Faulty Septic System	SS	none identified
Illegal Fill Placement	FP	none identified
Increased Impervious Surface	IS	none identified
Invasive/Introduced Species	IV	none identified
Landfill Leachate	LL	none identified
Litter	LI	none identified
Pesticide Use	PS	none identified
Plowed Watercourse	PW	none identified
Runoff Contamination via Transportation Corridors	TC	none identified
Site Clearing Prior to Development	SC	none identified
Watercourse Enclosure	WE	none identified
Wildlife Collision	WC	none identified
Wildlife Overpopulation	WO	none identified

**TABLE 2 WESTOVER CREEK SUBWATERSHED  
118 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	83
Online Pond	OP	12
Utility Pipeline	UP	7
Land Maintenance Practices	LM	5
Water Taking	WT	4
Abandoned Groundwater Wells	GW	2
Development	DV	2
Perched Culvert	CP	2
Habitat Fragmentation	HF	1
Buried Stream	BS	none identified
Channelization	CH	none identified
Combined Sewer Overflow	CSO	none identified
Dam	DM	none identified
Debris Jam	DJ	none identified
Detachment from Nature	DT	none identified
Encroachment	EN	none identified
Erosion	ER	none identified
Faulty Septic System	SS	none identified
Fluctuating Water Level	WL	none identified
Illegal Fill Placement	FP	none identified
Inadequate Stormwater Management	SW	none identified
Increased Impervious Surface	IS	none identified
Invasive/Introduced Species	IV	none identified
Landfill Leachate	LL	none identified
Litter	LI	none identified
Migration Barrier	MB	none identified
Nutrient Loading	NL	none identified
Outdoor Recreation Related Impacts	OR	none identified
Pesticide Use	PS	none identified
Plowed Watercourse	PW	none identified
Runoff Contamination via Transportation Corridors	TC	none identified
Sediment Loading	SL	none identified
Site Clearing Prior to Development	SC	none identified
Stormsewer Outfall	SO	none identified
Transportation Corridor Expansion	TE	none identified
Watercourse Enclosure	WE	none identified
Wildlife Collision	WC	none identified
Wildlife Overpopulation	WO	none identified

## EXECUTIVE SUMMARY – STRESS INVENTORY TABLES

**TABLE 3 WEST SPENCER CREEK SUBWATERSHED  
260 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	218
Water Taking	WT	9
Utility Pipeline	UP	5
Dam	DM	2
Online Pond	OP	2
Perched Culvert	CP	2
Channelization	CH	1
Habitat Fragmentation	HF	1
Invasive/Introduced Species	IV	1
Land Maintenance Practices	LM	1
Watercourse Enclosure	WE	none identified
Abandoned Groundwater Wells	GW	none identified
Buried Stream	BS	none identified
Combined Sewer Overflow	CSO	none identified
Debris Jam	DJ	none identified
Detachment from Nature	DT	none identified
Development	DV	none identified
Encroachment	EN	none identified
Erosion	ER	none identified
Faulty Septic System	SS	none identified
Fluctuating Water Level	WL	none identified
Illegal Fill Placement	FP	none identified
Inadequate Stormwater Management	SW	none identified
Increased Impervious Surface	IS	none identified
Landfill Leachate	LL	none identified
Litter	LI	none identified
Migration Barrier	MB	none identified
Nutrient Loading	NL	none identified
Outdoor Recreation Related Impacts	OR	none identified
Pesticide Use	PS	none identified
Plowed Watercourse	PW	none identified
Runoff Contamination via Transportation Corridors	TC	none identified
Sediment Loading	SL	none identified
Site Clearing Prior to Development	SC	none identified
Stormsewer Outfall	SO	none identified
Transportation Corridor Expansion	TE	none identified
Wildlife Collision	WC	none identified
Wildlife Overpopulation	WO	none identified

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
<b>Abandoned Groundwater Wells</b> <b>Map Code: GW</b>  <b>Definition: Groundwater wells that are no longer in use, often are in a state of disrepair and can be direct conduits for contaminants into groundwater aquifers.</b>	Conduct a direct mailing to all property owners identified in the HCA OGS Groundwater Study database as having abandoned groundwater wells on-site promoting legislation related to decommissioning and/or upgrading groundwater wells and the City of Hamilton Well Decommissioning Program.			Agriculture and Agri-Food Canada - Water Wells, Best Management Practices Pg 52  Ontario Water Resources Act Regulation 903: Water Wells  OMAFRA Best Management Practices Series – Water Wells	HHWSP	CITY / HCA / GV
	Conduct a direct mailing to all property owners identified in the HCA OGS Groundwater Study database as having abandoned groundwater wells on-site, that are also within Source Water Protection Areas, to promote funding available for decommissioning and upgrading groundwater wells through the Ontario Drinking Water Stewardship Program.				HHWSP / CITY Op. & Main.	HCA / HWSC
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact promote the importance of decommissioning abandoned groundwater wells to protect drinking water and prevent human and wildlife injury.				HHWSP	CITY / HCA / GV
			Work with landowners to decommission abandoned groundwater wells.		HHWSP	CITY / HCA / GV
<b>Buried Streams</b> <b>Map Code: BS</b>  <b>Definition: The structural alteration of a stream channel, involves piping the creek system underground, eliminating aquatic habitat.</b>		Undertake a feasibility and prioritization study for “daylighting” buried streams in the study area.		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 Cap. Plan.	HCA / DFO / MNR / HHWSP / RAP
	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.				HHWSP / HWSC	HCA / RAP / WPN / DFO

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
			Work with landowners to undertake daylighting projects using bioengineering and natural channel design principles, as recommended by the feasibility and prioritization study.	City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142-158  Evaluation, Classification and Management of Headwater Drainage Features: Interim Guidelines	HHWSP	HCA / DFO / CITY / HWSC
<b>Channelization</b> <b>Map Code: CH</b>  <b>Definition: The structural alteration of a stream channel, usually involves straightening of meanders and increasing gradient which increases velocity and erosion potential.</b>		Undertake a feasibility and prioritization study for restoring channelized creeks to those with a natural design.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-4 Page 107	CITY Cap. Plan.	HCA / DFO / MNR / HHWSP / RAP
	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.			HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55  Fisheries Act, Section 37	HHWSP / HWSC	HCA / RAP / WPN / CITY / RBG / FSRT
			Work with landowners downstream of channelized sites to rehabilitate the riparian zone to reduce flow velocities, erosion and sedimentation.	City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142-158	HHWSP	CITY / DFO / HCA / RBG / HWSC /
			Work with landowners to undertake natural channel design projects using bioengineering and natural channel design principles, as recommended by the feasibility and prioritization study.		HHWSP	HCA / DFO / CITY / HWSC
<b>Dams</b> <b>Map Code: DM</b>  <b>Definition: a barrier to obstruct the flow of water, usually one of earth or masonry, built across a stream or river.</b>	Conduct a direct mailing to property owners with dams identified in the MNR Dam Inventory Project to offer financial and technical assistance for the retrofitting or removal of dams.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-4 Page 107	HHWSP	HCA / HWSC / DFO / MNR
		Undertake a feasibility and prioritization study for the removal of dams inventoried.		HCA Planning and Regulation Policies and Guidelines	HCA Eng./ MNR	HWSC / HHWSP

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
(*Also includes weirs formerly map code WR)	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.			Pages 36-41, 55  Fisheries Act, Section 37  Hamilton Conservation Authority Dam Inventory Project	HHWSP / HWSC	HCA / MNR / DFO
			Work with landowners to remove/retrofit dams as prioritized in the Barrier Mitigation Plan associated with the Hamilton Harbour Fisheries Management Plan.	In-stream Barrier Assessment for the Hamilton Harbour AOC.  Hamilton Harbour Fisheries Management Plan	HHWSP	HCA / HWSC / MNR / DFO / CITY
<b>Debris Jams</b> <b>Map Code: DJ</b>  <b>Definition: The accumulation of debris within a watercourse that prevents the flow of water.</b>		Complete an assessment of creek/in-stream flow barriers that are prone to debris/ice jams and cause barriers to fish migration, including the prioritization of barriers to be removed.		In-stream Barrier Assessment for the Hamilton Harbour AOC.  Hamilton Harbour Fisheries Management Plan	HCA Eng.	MNR / HHWSP
	Incorporate debris jam removal into the City of Hamilton Extreme Park Makeover Program.				CITY Op. & Main.	HHWSP /HCA/ HWSC / MNR / DFO / BARC
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding proper debris jam removal so as to not disrupt aquatic habitat.				HHWSP / HWSC	HCA / MNR
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the importance of debris jam management in flood prevention.				HCA Eng.	MNR / CITY
			Work with landowners to remove debris jams using proper sediment and erosion control practices.		HHWSP	CITY / DFO / HCA / HWSC

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
<b>Detachment from Nature</b> <b>Map Code: DT</b>  <b>Definition: The condition of people disassociating their existence from nature.</b>		Assess barriers to participation in environmental programs to improve program design.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations PAA-2, PAA-3, EPI -1, EPI-2, EPI-5 Pages 129-138  Royal Botanical Gardens Back to Nature: Towards a Ontario Strategy for Bringing Children and Nature Together - Event and Workshop Report  Evergreen Schoolground Greening Resources: Getting Started	HHWSP	HWSC /CITY / GV
		Assess landowner willingness to participate in and/or support water quality improvement and habitat restoration projects.			HHWSP	CITY / HCA / HWSC
	Continue to implement the Watershed Steward Award Program.				HHWSP	BARC / HCA
		Encourage municipalities and trail managers to coordinate trail plans that improve access between urban centres and provide links to parks and rural areas			HCA Lands / CITY Cap. Plan. / RBG	HHWSP / HWSC
	Engage citizen groups to conduct local subwatershed monitoring & reporting projects, including: water quality, base flow, litter hot spots, Ecological Monitoring Assessment Network, Frog Watch, Ice Watch, etc.				HHWSP / HCA Ecol. / CITY Nat. Her. / BARC	GV / HWSC / RBG
	Engage high school students in volunteer opportunities related to environmental programming in order to meet community volunteer hours required for secondary school completion.				HCA / HWSC / BARC / RBG / GV	CITY
	Erect creek crossing & ecological corridor signage along roadways.				CITY Nat. Her.	BARC / GV / HCA / HWSC / WPN
	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, HNC Junior Naturalists, HCA Junior Conservationists, etc.				BARC / GV / HCA Lands / CITY Nat. Her. / RBG	
	Support the formation and activities of "Friends of" groups aimed at protecting and rehabilitating natural features.				HHWSP / HWSC / HCA Lands / CITY Nat. Her.	BARC / DFO / BTC

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote watersheds, watershed characteristics and the ecological significance of natural features.				HHWSP / HWSC	BARC / CITY / GV / HCA / WPN / DU
			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 Ecol. / CITY Op. & Main. / BARC	HWSC / RBG / BTC
			Work with schools and School Boards to implement the School Grounds Naturally Program; undertaking school yard naturalization projects.		HHWSP	HCA / CITY / HWSC
<b>Development Map Code: DV</b>  <b>Definition: The process of developing populated settlements: including housing and supporting infrastructure.</b>		Continue to incorporate downstream assessments of creek conditions, with recommendations for improvement, as part of the overall subwatershed studies conducted as part of new Greenfield development planning.		Credit Valley Conservation and Toronto and Region Conservation Authority Low Impact Development Stormwater Management Manual	CITY Cap. Plan.	HCA
	Host annual training sessions for City staff & developers to create awareness regarding the incorporation of development related BMPs into planning applications (i.e. pervious pavement, low maintenance lawns, green rooftops, storm water management, road-salt alternatives, snow-piling, erosion & sediment control measures, compliance & enforcement, etc.).				HCA Plan.	BARC / CITY / DFO / GV / MTO
		Implement the fish habitat buffer requirements for warm and coldwater streams as outlined in the HCA Planning and Regulations Policy and Guidelines document (30m setback for coldwater systems and 15m setback for warmwater systems).			HCA Ecol.	CITY

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
		implement stewardship and management recommendations resulting from the HCA development permit application review process.			HCA Plan.	CITY / HHWSP / HWSC
		Lobby the provincial government to amend the building code to include and favour Low Impact Development technologies; e.g. green roofs, multilevel parking, interlocking pavement, etc.			CITY Op. & Main. / HCA Eng.	HHHBA / GV
		Lobby the provincial government to support property tax-based loans for local development charges to assist in funding development and retrofits using low impact development technologies.			CITY Cap. Plan.	HHHBA / HCA Plan.
		Revise conflicting municipal by-laws regarding development practices and guidelines to facilitate increased use of Low Impact Development technologies.			CITY Cap. Plan. / HCA Plan.	GV / HHHBA / DFO
		Work with developers to initiate a Water Management Task Force to assist in implementing stewardship actions and recommendations from the Stormwater Master Plan.			HCA Eng.	CITY / RAP / HHHBA
<b>Encroachment Map Code: EN</b>  <b>Definition: The act of undertaking practices on another person's property, i.e. erecting structures, planting gardens, disposal of waste.</b>	Conduct a direct mailing of an encroachment education brochure to landowners adjacent to Conservation Authority, RBG and City natural areas.			HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55, 60	HCA Lands / RBG / HHWSP / CITY Op. & Main.	HWSC
	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	HCA Plan. / CITY Op. & Main. / RBG	HHWSP / BARC / GV / HWSC / BTC
	Install property demarcation posts (with agency logos) at regular intervals along property boundaries to prevent encroachment into natural areas.			City of Hamilton By-law No. 03-117 Illegal Dumping	HCA Lands / RBG / CITY Op. & Main.	HHWSP

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	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.				CITY Op. & Main. / HCA Lands / HHWSP / RBG	BARC / GV / HWSC / BTC
			Work with citizen groups to remove encroaching material on public and private lands, including "Friends of" work days, Adopt a Creek, Fishing Clubs, Stewardship Rangers, etc.		CITY Op. & Main. / HHWSP / RBG / HCA Lands	HHWSP / HCA / CITY / HWSC / BARC / GV / RBG / HNC
	Work with local nurseries & landscaping co.'s to educate / encourage landowners to use native plants.				HHWSP	CITY / HCA / HWSC / RBG / GV
<b>Erosion</b> <b>Map Code: ER</b>  <b>Definition: The process of soil being scoured or washed away by flowing water.</b>		Complete field study of stream morphology, determining erosion hotspots & associated causes		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-2, ULM-3, FW-4 Pages 69, 70, 107  HCA Planning and Regulation Policies and Guidelines Pages 68-69  Fisheries Act, Section 35  City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142, 159-160  Erosion and Sediment Control Guidelines for Urban Construction  OMAFRA Best Management	HCA Eng.	CITY Cap. Plan.
	Conduct a direct mailing to landowners where erosion has been identified through the City of Hamilton GRIDS Plan.				HHWSP	HCA / CITY / OSCIA / HWSC
	Create demonstration sites on public lands that highlight streambank stabilization and natural channel design projects.				HHWSP	CITY / HCA / DFO / HWSC / RBG / OSCIA
		Expand the City of Hamilton Erosion Hot Spots identification project into rural areas			CITY Cap. Plan.	HCA
	Host training sessions for City staff and developers to create awareness regarding BMPs & importance of properly maintained erosion / sediment control measures & enforcement.				HCA Eng.	CITY / DFO / HWSC
		Select erosion sites as identified in the City of Hamilton GRIDS Plan for the upcoming HCA Erosion and Sediment Control Pilot Project.			HCA Plan.	HHWSP / HWSC / CITY / DFO

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Utilize enforcement scheme to enforce appropriate erosion control measures on development sites, including: seeding, avoiding steep slopes, etc.			Practices Series – No-Till Making It Work	HCA Plan.	DFO / MNR / CITY
	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.				HHWSP / HWSC	CITY / DFO / HCA / HHHBA / OSCIA
			Work with City staff to install permeable conveyance systems (infiltration trenches) along roadsides as an alternative to the conventional ditch system.		CITY Op. & Main.	HCA / MTO / DFO
			Work with landowners to undertake bank stabilization and erosion rehabilitation projects using bioengineering design principles.		HHWSP	HWSC / HCA / BARC / DFO / OSCIA / FSRT
			Work with landowners to undertake erosion rehabilitation projects as identified in the City of Hamilton GRIDS Plan.		CITY Cap. Plan.	HHWSP / HWSC / HCA / DFO
<b>Faulty Septic Systems</b> <b>Map Code: SS</b>  <b>Definition: Malfunctioning septic systems; including plugged distribution tiles, infrequent tank pumping, etc. lead to untreated sewage contaminating our ground and surface water.</b>		Analyze existing water quality data for high levels of bacteria, chlorides, phosphorous, nitrates and TKN and cross reference the results against land use data to prioritize areas for education outreach and restoration.		Ontario New Home Warranty Program – A New Homeowner's Guide to Septic Systems  City of Hamilton's Greensville Community Subwatershed Study	CITY Bldg. Serv. / HCA Eng.	RAP
		Conduct an inventory to determine how many households in the Spencer Creek watershed are serviced by on-site treatment systems.			CITY Bldg. Serv.	RAP
	Create demonstration sites on public lands that highlight properly functioning septic systems.				CITY Bldg. Serv. / HCA Lands / CITY Op. & Main.	HHWSP / HWSC

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
		Develop a tax reduction incentive or grant program for upgrading faulty septic systems			City Cap. Plan.	MOE / HHWSP
		Undertake a risk analysis of the potential for old and/or degraded sewer lines to contaminate groundwater.			CITY Bldg. Serv.	MOE / RAP
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the proper maintenance of existing septic systems.				HHWSP / HWSC	HCA / BARC / CITY
			Work with landowners to properly maintain their septic systems or upgrade or decommission faulty or unused septic systems.		HHWSP	CITY / HCA / HWSC / GV
<b>Fluctuating Water Levels</b> <b>Map Code: WL</b>  <b>Definition: Irregular occurrences of high and low water levels in the creek system.</b>	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to explain the purpose and operation of Christie and Valens dams.				HCA Eng.	HHWSP / CITY / MNR
		Work to determine the cause of water level fluctuations and develop recommendations for altering practices to reduce or eliminate fluctuations.			HCA Eng.	HHWSP / CITY / MNR / DFO
			Work to implement alternative practices as per recommendations resulting from the inquiry into the cause of water level fluctuations in the system.		HCA Eng.	HHWSP / CITY / MNR / DFO
<b>Habitat Fragmentation</b> <b>Map Code: HF</b>  <b>Definition: Disruption of large continuous tracts of habitat.</b>		Continue to complete ecological surveys (using the Ecological Land Classification system) to ensure species at risk habitat or rare ecological areas are not disrupted.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-12 Page 123 HCA Planning and Regulation Policies and Guidelines Pages 53-59	CITY Nat. Her. / HCA Ecol.	MNR / HHWSP / HWSC / RAP / RBG
	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

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
		Develop How Much Habitat is Enough targets for each subwatershed.		City of Hamilton Draft Private Tree and Woodland Conservation By-law	HCA Ecol.	CITY/ HHWSP / DU / CCC / HWSC / RBG / MNR / DFO
	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.			Cootes to Escarpment Park System – A Conservation and Land Management Strategy	HHWSP	HHWSP / HCA / HWSC / CITY / HNC
	Encourage urban reforestation practices in private properties and reduction of lawn areas.			Nature Counts – City of Hamilton Natural Areas inventory	CITY	HHWSP / HCA / HWSC / HNC
		Establish a Woodlot Owners Association for this area as recommended by Re-Leaf Hamilton		City of Hamilton Natural Heritage Strategy	HWSC	HHWSP / HCA / HWSC / RBG / HNC / MNR
		Protect and enhance natural corridors through parks and public lands by ensuring that naturalization and habitat creation are incorporated into master planning.		City of Hamilton Natural Areas Acquisition Fund Strategy	HCA Lands / CITY Op. & Main. / RBG	HHWSP / HWSC / MNR / HNC
				Dundas Valley 50 Year Vision		
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy ecosystems and the importance of habitat connectivity.			Hamilton Harbour Fisheries Management Plan		
				OMAFRA Best Management Practices Series – Farm Forestry and Habitat Management	HHWSP / HWSC	HCA / RBG / CITY / DU / MNR / HNC / CC
		Work to secure Core and Linkage Areas identified in the Natural Heritage System using the Natural Heritage Acquisition Fund.		OMAFRA Best Management Practices Series – Fish and Wildlife Habitat Management	CITY Nat. Her.	HCA / RBG / HHWSP / HNC / HWSC
			Work with landowners to undertake habitat creation and enhancement projects which enhance core habitat by infilling areas within or linking existing forested areas	Aggregate Resources Act	HHWSP	OSCIA / DU / HWSC / HCA / DFO

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
			Work with utility companies to implement integrated vegetation management practices along utility corridors.		HCA Plan. / CITY Nat. Her.	MNR / HHWSP / HWSC / RBG / HNC
			Work with the aggregate industry to restore decommissioned pits and quarries into natural habitat through the Management of Abandoned Aggregate Properties Program.		HCA Ecol.	HCA / CITY / MNR
		Work with the aggregate industry when planning new/expanded pit and quarry operations to minimize impacts on the adjacent natural features.			HCA Ecol.	HCA / CITY / MNR
<b>Illegal Fill Placement</b> <b>Map Code: FP</b>  <b>Definition: The act of dumping fill material into or adjacent to natural areas.</b>	Host a training session for HCA and City staff on how to identify illegal fill and how to report incidences.			HCA Planning and Regulation Policies and Guidelines Pages 61-62  City of Hamilton By-law No. 03-117 Illegal Dumping	HCA Plan.	CITY / DFO
	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 Plan.	HHWSP / HWSC / CITY
			Work with landowners to rehabilitate fill sites where identified		HHWSP / HCA Plan.	CITY / DFO
<b>Inadequate Stormwater Management</b> <b>Map Code: SWM</b>  <b>Definition: Inadequately managing stormwater to control water quality and flooding; often associated with the drainage of developed lands.</b>		Implement recommendations from the City of Hamilton Stormwater Master Plan.		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	CITY Cap. Plan.	HCA / RAP / BARC / GV
		Offer financial incentives to replace driveways and decks with permeable pavement, interlocking brick, etc.			CITY Cap. Plan.	
	Promote City of Hamilton and Green Venture Programs to prevent the overloading of stormwater infrastructure; including the Wise Water Use Program, Protective Plumbing Program – Downspout Disconnection Program, Annual One-Day Rain Barrel Sale, Catch the Rain Rain barrel Pilot Project, High Household Water Consumption Program, and EnerGuide for Low Income Households Program.				CITY Cap. Plan. / GV	HHWSP / HCA / DFO / BARC / RAP / HHHBA

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Promote the use of constructed wetland technology and Low Impact Development in the design of stormwater management facilities.			Pages 38-44, 93-97, 122-125, 158-162	CITY / HCA Eng.	
			Retrofit existing dry stormwater management ponds to wet ponds where beneficial to water quality, aquatic habitat and erosion control.		CITY Cap. Plan.	RAP / HCA
			Retrofit outlet structures to decrease the velocity of stormwater as it flows into the creek system.		CITY Op. & Main.	HCA / RAP / HHWSP / HWSC
		Undertake a study to determine the percentage of landowners with connected downspouts.			CITY Cap. Plan.	GV / RAP / BARC
	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.				CITY Cap. Plan. / GV	HHWSP / HCA / DFO / BARC / RAP / HHHBA
		Work with developers to develop a premium 'Efficiency Package' for new homes that include LEED principles, LID technologies, Energy Star appliances, water conservation fixtures, etc. per the results of the Durham Region Pilot Project.			HCA Plan.	HHWSP / DFO / BARC / RAP / HHHBA
			Work with landowners to disconnect downspouts and install rain barrels.		CITY Cap. Plan.	HHWSP / BARC / GV
<p><b>Increased Impervious Surfacing</b>  <b>Map Code: IS</b></p> <p><b>Definition: The decreased potential for rainwater</b></p>	Create demonstration sites that highlight development related BMP's and Low Impact Development technologies; 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 Plan.	CITY / HHHBA / GV / HHWSP / HWSC

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
infiltration into the soil as a result of increased paved/impermeable surfacing.			Enhance groundwater recharge by ensuring that enough land, post construction remains pervious, so as to maintain water balance, as a condition for development application approval.	HCA Planning and Regulation Policies and Guidelines Pages 74-77  Fisheries Act, Section 34	HCA Eng.	CITY / GV / HHHBA
	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.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 38-44, 93-97, 122-125, 158-162	HCA Plan. / CITY Op. & Main.	HHHBA
		Incorporate a proportionally-based impervious surfacing fee for large commercial/industrial lands to offset the cost of stormwater infrastructure and compensate rehabilitation efforts associated with stormwater infrastructure.			CITY Cap. Plan.	HCA / RAP
		Measure impervious surfacing of commercial and industrial lands.			CITY Cap. Plan.	HCA / RAP
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the implementation of development related BMP's and Low Impact Development technologies when undertaking home renovations.				GV	HCA / CITY / HHHBA / HHWSP
Insufficient Riparian Buffer Map Code: RB  Definition: Disruption of large continuous tracts of habitat along watercourses.	Conduct a direct mailing to property owners identified as having insufficient riparian buffers, promoting funding and technical assistance available for establishing riparian buffers			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-2 Page 69	HHWSP / HWSC	HCA / CITY / OSCIA
	Create demonstration sites in high traffic locations that highlight riparian buffers. i.e. golf courses, municipal parks, etc.			HCA Planning and Regulation Policies and Guidelines	HHWSP	HCA / HWSC / CITY

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Host workshops promoting the environmental and economic benefits of riparian buffers. i.e., preventing soil loss, preventing drifting snow, habitat creation, etc.			Pages 40, 55, 60	HHWSP	HCA / HWSC / CITY / OSCIA
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 145-150,162-163	HHWSP	HCA / HWSC / CITY / OSCIA
	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.			City of Hamilton Natural Heritage Strategy  Dundas Valley 50 Year Vision	HHWSP	HCA / HWSC / CITY / OSCIA
			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 Park System – A Conservation and Land Management Strategy	HHWSP	HCA / HWSC / CITY / OSCIA
<b>Invasive/Introduced Species</b> <b>Map Code: IV</b>  <b>Definition: The establishment/proliferation of exotic species that have no natural control measures which compete with native species for resources and degrade the ecosystem.</b>		Develop an Invasive Species Management Program which includes monitoring sites and management for specific species.		HCA Planning and Regulation Policies and Guidelines Pages 53-56, 70-71	HCA Ecol.	HHWSP / MNR / HWSC / CITY / HNC / RBG / CCC
	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.			Action Plan for Addressing Terrestrial Invasive Species within the Great Lakes Basin	HCA Ecol.	HHWSP / HWSC / CITY / HNC
		Implement the actions in the Dundas Valley 50 Year Vision, Cootes to Escarpment and City of Hamilton Natural Heritage Strategies relating to preserving and enhancing biodiversity.		Invasive Alien Plant Species Found in the Carolinian Zone – Inventory and Management Options for rare Charitable Research Reserve  Mistaken Identity – Invasive	HCA Ecol.	HHWSP / HWSC / CITY / RBG / BARC

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	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.			Plants and their native look-alikes.  City of Hamilton Natural Heritage Strategy  Dundas Valley 50 Year Vision	HHWSP	HCA / HWSC / CITY
			Work with landowners to control invasive species and to plant native species.	Cootes to Escarpment Park System – A Conservation and Land Management Strategy	HHWSP	HCA / HWSC / CITY / GV
	Work with nurseries to develop a promotional program highlighting native species alternatives for commonly used non-native ornamental species.				HHWSP	CITY / HWSC / RBG / HCA / GV
<b>Land Maintenance Practices</b> <b>Map Code: LM</b>  <b>Definition: Errant or excessive land maintenance practice which unnecessarily degrade wildlife habitat.</b>		Incorporate the installation of alternative roadside vegetation, such as MTO roadside prairie and wildlife shrub corridors, into existing maintenance plans.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-2, FW-4 and Pages 106-107	City Op. & Main.	HCA / CITY
			Work to naturalize infrequently used areas of municipal parks and Conservation Areas.		CITY Op. & Main. / HCA Lands	HHWSP / HWSC / HNC
		Work with the City to develop guidelines for using native plant species for revegetation projects along roadsides			City Op. & Main.	HCA Ecol.
			Work with the City to ensure roadside maintenance is not done in excess of access standards.		CITY Op. & Main.	HCA / HHWSP / HWSC / GV / HNC
		Work with utility companies to develop protocols for recommended low impact land maintenance practices to be implemented throughout utility corridors.			HCA Plan.	CITY / HHWSP / HWSC / RBG

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES	
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities				
<p><b>Landfill Leachate</b> Map Code: LL</p> <p><b>Definition:</b> rainwater filtering down through the landfill materials with the potential to contaminate groundwater aquifers.</p>		<p>Monitor existing groundwater sampling programs to ensure that groundwater contamination is not occurring as a result of landfill leachate.</p>		<p>Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-12 Page 77</p> <p>HCA Planning and Regulation Policies and Guidelines Page 60</p>	HCA Eng.	CITY / RAP / MOE	
<p><b>Litter</b> Map Code: LI</p> <p><b>Definition:</b> The act of illegally disposing of waste into public/natural areas.</p>	<p>Implement the ‘Pack it in – Pack it out’ waste disposal policy at strategic city parks, Conservation Areas and RBG lands.</p>			<p>City of Hamilton By-law No. 03-118 Litter, Yard Waste and Property Maintenance</p>	CITY Op. & Main. / RBG / HCA Lands	HHWSP	
	<p>Promote the City of Hamilton’s Team Up to Clean Up, Adopt a Park. Adopt a Road and Extreme Park Makeover Programs to assist community minded residents to undertake litter clean up projects.</p>				CITY Op. & Main.	HCA / RBG / GV / HWSC / HHWSP / BARC	
		<p>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 and Green Strategy Components.</p>				HCA Lands / CITY Op. & Main.	RBG
	<p>Utilize literature, websites, public service announcements, &amp; direct landowner contact to create awareness regarding the prevention and clean-up of litter.</p>					CITY Op. & Main. / HCA Lands / RBG	HHWSP / HWSC / GV / BARC
	<p>Work to develop an Adopt a Park / Friends of Program for Conservation Authority lands.</p>					HCA Lands	CITY / HHWSP / HWSC
	<p>Work to replace all current recycle bins in public areas with ones that have lids.</p>					CITY Op. & Main. / RBG / HCA Lands	GV

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
			Work with local residents to host litter clean up events on public lands; including City parks, Conservation Areas and RBG lands.		CITY Op. & Main. / RBG / HCA Lands	HHWSP / HWSC / BARC / GV
<b>Migration Barrier</b> <b>Map Code: MB</b>  <b>Definition: Any infrastructure that precludes the passage of wildlife into upstream habitat or the upper reaches of natural corridors.</b>	Erect wildlife crossing signage where known migration corridors cross roadways and trails.			In-stream Barrier Assessment for the Hamilton Harbour AOC.	HCA Ecol. / CITY Nat. Her. / RBG	HHWSP / HNC / BARC / HWSC / WPN / RAP
			Work to retrofit any infrastructure that precludes the passage of wildlife into upstream habitat or the upper reaches of natural corridors. Possible retrofit options include: underpasses, fish ladders, by-pass channels etc.	Hamilton Harbour Fisheries Management Plan	HCA Ecol. / CITY Nat. Her. / RBG	HHWSP / HNC / BARC / HWSC / WPN / RAP
<b>Nutrient Loading</b> <b>Map Code: NL</b>  <b>Definition: Excessive nutrients being inputted into a watercourse; often resulting from the application of manure/fertilizer. (* Also includes Phosphorous Loading formerly map code PL)</b>	Create demonstration sites on public lands that highlight nutrient management BMP projects.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-9, RM-7. Pages 116, 158	HHWSP	HCA / HWSC / OSICA / RAP
		Develop a fertilizer use by-law under the Fertilizer Act, limiting the use of fertilizer for non essential purposes.		Nutrient Management Act 2002, O. Reg 267/03	CITY Cap. Plan.	HCA / BARC / RAP / HHWSP / RBG
		Develop a plan to reduce nutrient levels to meet Provincial Water Quality Objectives as determined by the land use dependent nutrient level monitoring program.		Fisheries Act, Section 34	HCA Eng.	CITY / OSCIA / OMAFRA / BARC / RAP / HHWSP / RBG
		Develop a total phosphorous target based on the PWQO recommendation of 30µg/L for control of excessive plant growth, 20µg/L for control of Nuisance concentrations of algae or 10µg/L for high level of protection against aesthetic deterioration.		HCA Planning and Regulation Policies and Guidelines Page 72	HCA Eng.	CITY / OSCIA / OMAFRA / BARC / RAP / HHWSP / RBG
		Encourage the Ministry of the Environment to develop a nutrient monitoring and reduction program for non agricultural nutrient generating land uses; including nurseries, hobby farms and equine facilities.		OMAFRA Best Management Practices Series – Nutrient Management Planning  OMAFRA Best Management Practices Series – Manure Management	HCA Eng. / HCA Ecol.	OMAFRA / OSICA / MNR / RAP

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
		Encourage the Ministry of the Environment to require that biosolid users submit soil sampling results, post application, as a monitoring condition of the Certificate of Approval process.			HCA Eng. / HCA Ecol.	MOE / CITY / RAP
		Establish a nutrient level monitoring program with strategic sampling sites that are land use dependent, to identify specific sources of nutrient loading.			HCA Eng.	CITY / OSCIA / OMAFRA / BARC / RAP / HHWSP / RBG
	Host a training workshop for local golf course practitioners to discuss BMP's for golf course management, including Audubon Cooperative Sanctuary Program certification standards.				HHWSP	HCA / HWSC / RAP / RCGA
		Lobby the provincial government to develop a policy to ban the use of phosphorous in fertilizer for cosmetic use.			GV	CITY / HCA / MOE
	Promote software associated with the Nutrient Management Plan, to agricultural operators to ensure precise fertility programs.				HHWSP	OSCIA / OMAFRA / HWSC
	Promote the City of Hamilton Only Rain Down the Drain awareness campaign.				City Op. & Main.	HHWSP / GV / BARC / RAP
	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.				HHWSP / HCA Eng.	BARC / GV / RBG / OSCIA / MOE / OMAFRA / RAP
			Work with landowners to reduce nutrient loading by implementing agricultural and urban BMP's related to nutrient management.		HHWSP	OSCIA / HCA / CITY / OMAFRA / HWSC
<b>On-line Ponds</b> <b>Map Code: OP</b>  <b>Definition: An in-stream structure designed to impound stream flow; leads</b>	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	HHWSP / HWSC	DFO / HCA / OSCIA / OMAFRA / CITY

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
to increased in-stream temperatures downstream and is often a barrier to fish migration.			Work with landowners to restore or retrofit on-line ponds.	Fisheries Act, Section 37  HCA Planning and Regulation Policies and Guidelines Page 63  In-stream Barrier Assessment for the Hamilton Harbour AOC	HHWSP / HCA Plan. / HCA Eng.	DFO / HCA / OSCIA / OMAFRA / CITY / HWSC
<b>Outdoor Recreation Related Impacts</b> Map Code: OR  Definition: Recreational activities occurring in natural areas that inadvertently degrade the natural features of the area.	Add "tread lightly" messaging to partner recreation oriented websites.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-8, PAA-1, PAA-2, PAA-3 Pages 115, 126-130	HCA Lands / CITY Op. & Main. / RBG	NHC / BTC
		Consider designating days/areas for ATV and snowmobile use.		The Conservation Lands of Ontario – Three Year Business Plan	HCA Lands / RBG / CITY Op. & Main.	HHWSP / HNC
		Continue to monitor Category A and B waterfalls on public lands for signs of degradation.		A Joint Outdoor Tourism Marketing Strategy	HCA Lands / CITY Op. & Main.	
		Develop marketing strategies for sensitive lands that focus on sustainable use.		Niagara Escarpment Access Enhancement Plan	HCA Lands / RBG / CITY Op. & Main.	BTC / HNC
	Erect signage explaining the environmental significance of natural areas and promoting user "etiquette" for the area.			Dundas Valley 50 Year Vision Strategy	HCA Lands / RBG / CITY Op. & Main.	HHWSP / HNC / BTC
			Host annual clean up days for natural areas identified as having excessive amounts of litter.	Cootes to Escarpment Conservation & Land Management Strategy	HCA Lands / RBG / CITY Op. & Main.	HHWSP / HWSC / HNC / BARC / BTC
	Install deterrent mechanisms along trails and in off trail areas known to be degraded by trespassing; such as no trespassing signage.				HCA Lands / RBG / CITY Op. & Main.	HNC / BTC
	Promote the City of Hamilton Adopt-a-Park and Extreme Park Makeover Programs.				CITY Op. & Main.	HCA / RBG / HHWSP / HNC / BTC
		Refer to the Niagara Escarpment Access Enhancement Plan to design infrastructure for high traffic areas to guide users along approved trails.			HCA Lands / CITY Op. & Main. / RBG	BTC

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
			Rotationally restrict access to degraded areas to allow for the regeneration of vegetation.		HCA Lands / RBG / CITY Op. & Main.	HNC / BTC
	Support the formation and activities of "Friends of" groups aimed at protecting and rehabilitating natural features.				HHWSP / CITY Op. & Main. / HCA Lands / RBG	HWSC / BARC / BTC
			When conducting maintenance of existing trails, seek guidance from the HCA Planning and Engineering Department with respect to materials and design.		HCA Lands / RBG / CITY Op. & Main.	HHWSP / HNC / BTC
		When undertaking master planning exercises, design trails to meet guidelines as set in HCA's Planning and Regulation Policies and Guidelines.			HCA Lands / RBG / CITY Op. & Main.	
<b>Perched Culverts</b> <b>Map Code: CP</b>  <b>Definition: In-stream culverts that when improperly designed/installed, create barriers to water flow and fish migration.</b>	Host training sessions for HCA Lands and City staff to promote the proper design and installation of 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  In-stream Barrier Assessment for the Hamilton Harbour AOC	CITY Op. & Main / HCA Eng.	DFO / HHWSP / MNR
		Undertake an inventory of perched and closed bottom culverts throughout the subwatershed. Prioritize culverts for mitigation or replacement.			CITY Op. & Main.	DFO / HCA / HHWSP / MNR
	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.				HHWSP / HWSC	DFO / HCA / CITY / MNR
			Work with landowners to remove/retrofit perched and closed bottom culverts; begin with those prioritized in the Barrier Mitigation Plan of the In-stream Barrier Assessment for the Hamilton Harbour AOC.		HHWSP / HCA Plan. / HCA Eng.	DFO / HCA / OSCIA / OMAFRA / CITY

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STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
<b>Pesticide Use</b> <b>Map Code: PS</b>  <b>Definition: The application of pesticides to control perceived pests.</b>	Create demonstration sites on public lands that highlight pesticide/herbicide free lawns, gardens, natural areas, crops, etc.			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  Pesticides Act Ontario Regulation 63/09  OMAFRA Best Management Practices Series – integrated Pest Management  OMAFRA Best Management Practices Series – Pesticide Storage, Handling and Application	HHWSP	CITY / GV / HWSC / OSCIA / OMAFRA
	Host a training workshop for local golf course practitioners to discuss BMP's for golf course management, including Audubon Cooperative Sanctuary Program certification standards and the Ministry of the Environment Gold Course IPM Accreditation.				HHWSP	CITY / HWSC / RCGA
	Promote Municipal and Provincial Pesticide By-Laws.				CITY Op. & Main. / GV	HWSC / HHWSP / OSCIA / OMAFRA
	Promote the City of Hamilton's Turf King Hamilton Program which includes Integrated Pest Management principles, Natural Tips for Healthy Lawns and Gardens and alternative turf management techniques.				CITY Op. & Main.	GV / HWSC / HHWSP / OSCIA / OMAFRA
	Promote the Ministry of the Environment 'Add It Up Program – Going Pesticide Free' Program				GV	CITY / HHWSP / HWSC
		Undertake a study to determine the current level of pesticide/herbicide use in the subwatershed and develop targets for reduction.			CITY Op. & Main.	GV / HWSC / HHWSP / OSCIA / OMAFRA
	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 to promote alternatives to traditional methods.				GV	HCA / OSCIA / OMAFRA / HHWSP / CITY
			Work with landowners to implement alternatives to pesticide use.		HHWSP / GV	CITY / HWSC / OSCIA / OMAFRA

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
<p><b>Plowed Watercourse</b> Map Code: PW</p> <p><b>Definition: Headwater swales or small watercourses that are worked for agricultural production.</b></p>	Conduct a direct mailing to landowners where plowed watercourses have been identified to promote technical and financial assistance available for BMP projects related to agricultural drainage.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-3, ULM-4 Pages 70, 71  Fisheries Act, Section 37	HHWSP	DFO / HCA / OSCIA / HWSC
	Create and link to existing OMAFRA demonstration 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	HHWSP	DFO / HCA / OMAFRA / OSCIA / HWSC
	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.			OMAFRA Best Management Practices Series – Soil Management	HHWSP / HWSC	DFO / HCA / OMAFRA / OSCIA
			Work with landowners to install effective agricultural land drainage; e.g. grassed waterways, Water and Sediment Control Basins, etc.		HHWSP	DFO / HCA / HWSC / RBG / RAP
<p><b>Runoff Contamination via Transportation Corridors</b> Map Code: TC</p> <p><b>Definition: Contamination resulting from stormwater runoff from major arterial roadways; often associated with the application of salts for de-icing and the residual precipitate created by automobile exhaust.</b></p>	Host training sessions for City Staff and Contractors using the Ministry of the Environment Snow Disposal and De-icing Operations in Ontario Guidelines.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-5b Page 71	CITY Op. & Main.	MTO
			Implement improved snow removal methods as recommended by the study to determine effective methods of snow removal which also reduce contamination of watercourses.	Fisheries Act, Section 34  City of Hamilton 2003 Road Salt Management Plan	CITY Op. & Main.	MTO
			Install vegetated filter strips and riparian buffers along medians and roadsides.	Municipalities of Wellington County – 2005 Salt Management Plan	CITY Op. & Main.	MTO / HCA
	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.				CITY Op. & Main. / HCA Eng.	DFO / MTO

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
		Support planning for alternative and sustainable transportation strategies including Rapid Transit.			CITY Op. & Main.	HCA / MTO / HHHBA / RAP
		Undertake a study to determine the most effective method of snow removal that will reduce contamination of watercourses.			CITY Op. & Main.	DFO / HCA / MTO
	Utilize literature, websites, public service announcements & direct landowner contact to promote the use of sidewalk salt alternatives.				CITY Op. & Main. / GV	DFO / HCA / MTO
		Investigate using the Region of Waterloo Smart About Salt Council as a model to develop a Smart About Salt Program in Hamilton.				
<b>Sediment Loading</b> <b>Map Code: SL</b>  <b>Definition: Organic and inorganic material that is entrained by the flow of water and is deposited in a creek system.</b>			Monitor and enforce the proper installation and maintenance of sediment and erosion control measure on construction sites.	Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-3, ULM-5, FW9 Pages 70, 71, 116  Fisheries Act, Sections 34 and 36  Erosion and Sediment Control Guidelines for Urban Construction  City of Hamilton By-law for Prohibiting and Regulating the Alteration of Property Grades, the Placing or Dumping of Fill, and the Removal of Topsoil  OMAFRA Best Management Practices Series – No-Till Making it Work  Ministry of the Environment Stormwater Management Design Guidelines	HCA Plan.	DFO / HHHBA / CITY
	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.				HHWSP / HCA Eng.	DFO / HWSC / MNR / OSCIA / OMAFRA / RAP
			Work to achieve and maintain the total suspended solids target developed based on the PWQO turbidity recommendation of between 5-50 FTU (Formazin Turbidity Units)		HCA Eng.	DFO / HWSC / HHWSP / MNR / OSCIA / OMAFRA / RAP
			Work to mitigate non point sediment sources identified in the Watershed Planning Network Priority Remediation Report.		HCA Eng.	DFO / MNR / CITY / HWSP / HHWSP
			Work with contractors to ensure that site clearing prior to development is phased as the project progresses to reduce the area and length of time bare soil is exposed.		HCA Plan.	CITY / HHHBA / DFO

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
			Work with landowners to reduce sediment loading by implementing BMP projects; e.g. streambank stabilization, riparian buffers, natural channel design.		HHWSP	DFO / HWSC / HCA / MNR / OSCIA / OMAFRA
<b>Site Clearing Prior to Development</b> <b>Map Code: SC</b>  <b>Definition: The act of stripping or excavating the vegetation and topsoil from a site prior to construction works.</b>		Develop a municipal by-law to serve as a guideline for the management of tree species.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-4 Page 71	City Nat. Her.	HCA / HWSC / MNR
	Host training sessions for City staff, developers and consultants to promote City standards and guidelines related to site preparation prior to development.			HCA Planning and Regulation Policies and Guidelines Pages 50-62, 68-69	CITY Bldg. Serv. / HCA Plan.	DFO / HHHBA
	Promote the City of Hamilton By-law for Prohibiting and Regulating the Alteration of Property Grades, the Placing or Dumping of Fill, and the Removal of Topsoil			City of Hamilton Draft Private Tree and Woodland Conservation By-Law	CITY Nat. Her.	DFO / MNR / RAP / HHHBA / HWSC / HHWSP
	Work with contractors to ensure that only necessary areas of development sites are cleared prior to development to eliminate the unnecessary destruction of habitat.			City of Hamilton By -Law No. 03-126 Site Alteration By-Law  Erosion and Sediment Control Guidelines for Urban Construction  City of Hamilton By-law for Prohibiting and Regulating the Alteration of Property Grades, the Placing or Dumping of Fill, and the Removal of Topsoil	HCA Plan.	CITY / HHHBA / DFO
<b>Storm Sewer Outfalls</b> <b>Map Code: SO</b>  <b>Definition: The point where a sewer system discharges into a watercourse during a storm event.</b>	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	BARC	HCA / RBG / GV / HWSC / HHWSP / CITY
	Promote the City of Hamilton Public Works Stormwater Pollution Solutions for Urban and Rural Residents Outreach Program			Fisheries Act, Section 34	CITY Op. & Main.	HCA / RBG / GV / HWSC / HHWSP

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Promote the Municipal Sewer-Use By-law No. 06-228.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 138, 158-159	CITY Op. & Main.	HCA / RBG / GV / HWSC / HHWSP
		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.			CITY Op. & Main. / HCA Eng.	BARC / RAP / MOE
			Work to implement the recommendations in the sewershed water quality study.		CITY Op. & Main. / HCA Eng.	RAP / BARC / HWSC / DFO / HHWSP
			Work with City Staff to retrofit outfalls to incorporate erosion control measures such as plunge pools, rip rap, tree planting etc.		CITY Op. & Main.	HCA / RAP / BARC / HWSC / DFO / HHWSP
		Work with Green Venture to develop a Stormwater Mitigation Program.			GV	HCA / RAP / BARC / CITY
			Work with landowners to disconnect downspouts and to install rain barrels.		GV / CITY Op. & Main.	HHWSP / BARC
			Work with landowners to establish riparian buffers and/or erosion protection downstream of storm sewer outfalls; e.g. river stone.		HHWSP	HCA / RAP / BARC / HWSC / DFO / CITY
		Reduce stormwater load to meet the MOE volumetric target of a 90% overflow capture rate for combined sewer systems			CITY Op. & Main.	BARC / RAP / HCA / GV
		Work toward achieving the final net loading targets for CSO's outlined in the RAP.			CITY Op. & Main.	BARC / RAP / HCA / GV

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
<b>Transportation Corridor Expansion</b> <b>Map Code: TE</b>  <b>Definition: The process by which new roads are built or existing roads are widened.</b>	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 Op. & Main.	HCA / MTO / HHHBA
		When planning for major road works, design transportation corridors using new technologies for environmental solutions.			CITY Op. & Main.	HCA / MTO / HHHBA
			When repairing roads, utilize new technologies for road maintenance that are proven to have environmental benefits.		CITY Op. & Main.	HCA / MTO / HHHBA
<b>Utility Pipeline</b> <b>Map Code: UP</b>  <b>Definition: Oil and gas conveyance systems.</b>		Review individual utility company emergency protocols for identification of issues, reporting protocols and emergency contacts.			HCA Eng.	CITY / MOE
<b>Water Takings</b> <b>Map Code: WT</b>  <b>Definition: The process by which surface and groundwater are pumped out of the natural system; for the purposes of irrigation, aggregate extraction, etc.</b>		Develop monitoring program to assess impacts of surface water takings on creek systems and aquatic wildlife during periods of low water, include recommendations for reducing impacts.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-12 Page 77  Ontario Water Resources Act O. Reg. 387/04  OMAFRA Best Management Practices Series – Irrigation Management  Information to Support a Level III Declaration and Implementation Strategy for the Hamilton Conservation Authority Watershed	HCA Eng.	MNR / MOE
	Encourage landowners with surface water takings to install groundwater systems.				HHWSP	HCA / OSCIA / MOE / HWSC / OMAFRA
	Encourage landowners with water taking needs to establish an Irrigation Advisory Committee to schedule takings alternately.				HHWSP	HCA / OSCIA / MOE / HWSC / OMAFRA
	Host open houses when experiencing Level 1 low water conditions to address landowner concerns and promote recommended reductions in rates and volumes of takings.				HHWSP / HCA Eng.	HCA / OSCIA / MOE / HWSC / OMAFRA

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

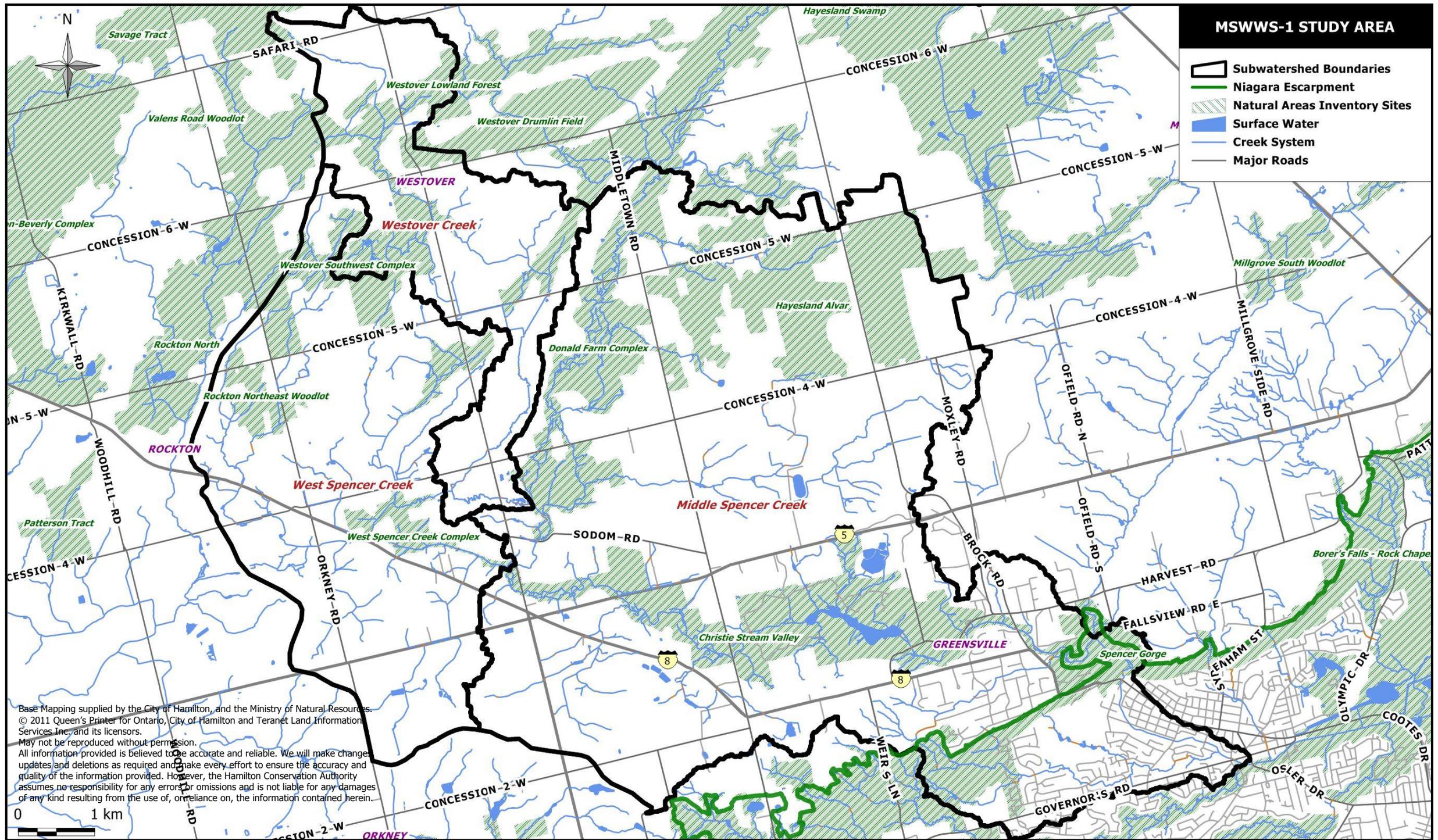
STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES	
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities				
		Upon receipt of new Permit to Take Water applications, evaluate the taking against active permits in the area to determine the potential stress level related to multiple users on a given system.		HCA Protocol Memorandum Ontario Low Water Response Hamilton Conservation Authority Watershed	HCA Eng.	MOE	
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote BMP's relating to water conservation technology.				HHWSP	HCA / OSCIA / MOE / HWSC / OMAFRA	
			Work with landowners to implement BMP's related to water conservation.		HHWSP	HCA / OSCIA / MOE / HWSC / OMAFRA	
			Work with landowners who have groundwater taking systems to decommission unused wells in accordance with the Ontario Water Resources Act.		HHWSP	HCA / OSCIA / CITY	
<b>Wildlife Collisions</b> <b>Map Code: WC</b>  <b>Definition: Incidences where animals are struck by vehicles or where animals collide with buildings, often occurring with buildings with large windows.</b>			Conduct temporary road closures at known wildlife crossings and nesting sites during peak migration and nesting times.	British Columbia Wildlife Collision Prevention Program Report  City of Ottawa Wildlife/Vehicle Collision Prevention Program	CITY Nat. Her.	MNR / HCA / MTO / RBG	
	Erect additional wildlife caution signage that is species specific, along roadways at known points of frequent collisions.					CITY Nat. Her.	MNR / HCA / MTO / RBG
			Erect fencing and alternative nesting mounds at known sites for turtle nesting.			CITY Nat. Her.	MNR / HCA / MTO / RBG
		Evaluate the effectiveness of the MTO roadside prairie and wildlife shrub corridor projects in preventing wildlife collisions.				CITY Nat. Her.	MNR / HCA / MTO
			Produce and distribute window decals for large windows of homes and high rise buildings to prevent bird collisions.			HCA Ecol. / CITY Nat. Her.	HHWSP / HWSC / RBG
			Reduce the use of road salt or consider alternatives that do not attract wildlife.			CITY Nat. Her.	MNR / HCA / MTO

**EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE**

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Awareness Opportunities	Special Study Opportunities	Restoration Opportunities			
	Utilize literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding managing human-wildlife conflicts.				CITY Nat. Her. / HCA Ecol.	MNR / MTO / RBG / HWSC / HHWSP
		When planning major road works, consider the incorporation of wildlife over/underpasses, avoiding known migratory corridors and other wildlife accommodations in the design.			CITY Nat. Her.	MNR / HCA / MTO / RBG
<b>Wildlife Overpopulation</b> <b>Map Code: WO</b>  <b>Definition: When a species population exceeds the carrying capacity of its habitat.</b>	Conduct a direct mailing to landowners adjacent to natural areas densely populated with deer to create awareness regarding reasons not to feed or intentionally attract wildlife.			Strategy for Preventing and Managing Human-Deer Conflicts in Southern Ontario	HCA Ecol. / CITY Nat. Her.	HHWSP / MNR
			Work to implement the recommendations for sustainable populations in the HCA/MNR Deer Management Strategy.			

**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
GV	Green Venture	OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
HCA	Hamilton Conservation Authority	OSCIA	Ontario Soil and Crop Improvement Association
HCPI	Hamilton Coalition on Pesticide Issues	WPN	Watershed Planning Network



## FOREWARD

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***The following has been extracted from the Spencer Creek Conservation Authority's publication, The Spencer Story (1965), which was used in local high schools to engage youth in watershed stewardship:***

Canada is a country of great natural wealth. With her present growing population and industrial expansion, the 1990's should see her among the wealthiest nations of the world. But, do we want to live in a land of vanishing beauty, of increasing ugliness, of shrinking open spaces, and an over-all environment that is diminished daily by pollution, noise, blight and drought?

Dr. Edward G. Pleva of the University of Western Ontario and a speaker and conservationist of note, suggests that if a line is drawn from Quebec City through Montreal, Kingston, Toronto, Hamilton, London to Windsor, and then if we think of the land twenty-five miles on both sides of the line, we locate the living and working area of three-fifths of the population of Canada, the situation of four-fifths of the country's industrial activity, and the source of two-fifths of the agricultural crop value. It is in this corridor which he has named the Grand Trunk Corridor that the greatest expansion population-wise and industrially is taking place and will continue to do so. It is here that the questions asked in the preceding paragraph is most pertinent. We can misuse the land and diminish or even destroy our resources, or we can create a land in which physical and spiritual welfare will go hand in hand. This is the conservation decision we must make in the 1960's.

A new theory of history is creeping into our textbooks, namely, that earlier civilizations passed away because their people did not learn to live in harmony with nature and to work with her not against her. The great empire of Babylonia situated on the lower reaches of the Tigris and Euphrates Rivers, which we are told was the site of the Garden of Eden and which lasted for over 2000 years, depended on man-made canals to bring the necessary water from the rivers to the dry lands around. When wars and neglect caused the canals to fill with silt and fail in their purpose, fewer and fewer people could live there. Finally, the Garden of Eden changed into a desert. Roman farms were quite fertile at first but suffered from erosion, continual cropping without returning anything to the soil, and poor land management. The Roman Empire had to look to other sources for food but they too eventually could not feed the masses of the Empire and in 455 A.D. the city of Rome was captured and burned by tribes from Northern Europe. The stories of Babylon will happen again and again until mankind learns to work with nature and not try to be her master.

The concept that mankind must work with nature and use the resources of his country wisely knowing that none of these is unlimited and that they were intended also to serve the needs of generations yet unborn, must become part of the way of life of our young people especially, if this land of ours is not to follow in the destructive footsteps of Babylonia and Rome. Teachers know that one of the fundamentals of their profession is to teach from the near to the far. It follows then, that if our young people are to grow up and become the future stewards of the land, they must first of all know the story of the watershed in which they live and understand something of its particular problems. To help in the development of this concept is the chief reason for the publication of the Spencer Creek Story, 1965.

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*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.*

## BACKGROUND

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### SPENCER CREEK WATERSHED

The Spencer Creek watershed is the largest watershed within the jurisdiction of the Hamilton Conservation Authority (HCA) at 279 km<sup>2</sup>, or 59% of the HCA watershed, and outlets directly into Cootes Paradise Marsh. The HCA notes this watershed as being comprised of 15 subwatersheds. However two of these, Borer's Creek and Chedoke Creek, feed directly into Cootes Paradise Marsh, and not the Spencer Creek system itself. The Spencer Creek watershed is characterized by wetlands, rural land use and rural communities in the upper part of the watershed and urban development in the lower portion. The subwatersheds of Spencer Creek are located within the City of Hamilton and the Township of Puslinch.

The Niagara Escarpment and Dundas Valley are significant natural features located in the lower portion of the watershed, while the Beverly Swamp is located in upper portion of watershed. There are two large dams located on the Spencer Creek watershed, Christie Dam & Valens Dam. Both of these dams are managed by the Hamilton Conservation Authority. Spencer Creek is a 6<sup>th</sup> order stream and travels about 40 km before reaching its outlet at Cootes Paradise Marsh, a provincially significant coastal wetland (Source Water Protection Halton-Hamilton Region, January 2006).

For a full characterization of the Spencer Creek watershed refer to the *Preliminary Watershed Description Report for the Hamilton Conservation Authority's Watersheds* (Source Water Protection Halton-Hamilton Region, January 2006) and any updates thereof.

The Spencer Creek watershed makes up 57% of the Hamilton Harbour watershed. The Hamilton Harbour was declared an Area of Concern (AOC) in 1987 by the International Joint Commission due to its high contamination of toxic sediments and degradation of water quality and aquatic habitat. As a result, the HHRAP was initiated in order to de-list the Hamilton Harbour as an AOC. The HHRAP aims to remove this designation by 2015 by meeting specific targets as they relate to water quality and bacterial contamination, urbanization and land management, toxic substances and sediment remediation, fish and wildlife habitat, public access and aesthetics, education and public information, and research and monitoring. The HHRAP is implemented by the Bay Area Implementation Team; which is made up of industrial, commercial and government representatives within the limits of the Hamilton Harbour watershed. The Bay Area Restoration Council was formed

in response to the HHRAP and works towards community involvement and awareness on the issues surrounding this AOC and the best management practices that are needed in order to de-list this watershed. The Stage 2 Report & Update was released in 2002 listing the targets met to date as well as those stresses still in need of mitigation.

The Spencer Creek Stewardship Action Plans supersede the current Spencer Creek Watershed Management Plan (HCA, 1997) and are deliverables of the Hamilton Conservation Authority Five-year Strategic Plan (2007-2011), within which the completion of up-to-date subwatershed plans are listed as strategic water management objectives. The plans within this document will also contribute to both, the Hamilton Harbour Remedial Action Plan (HHRAP) and the Five-year Strategic Plan (2007-2011) for the HCA's Stewardship Program, also known as the Hamilton-Halton Watershed Stewardship Program.

A detailed Geographical Information Systems analysis of watershed characteristics and monitoring data was conducted to prioritize the order in which the Stewardship Action Plans would be developed for the 15 subwatersheds of Spencer Creek. Additionally, HCA staff and staff of local environmental agencies were consulted to provide expert input into the prioritization exercise. This analysis resulted in a determination that the plans would be developed for each subwatershed in descending order based on urbanization. The urban most subwatersheds would be addressed in the first, second and third years of the project as they demonstrated poor water quality, a lack of riparian vegetation and the absence of protective legislation; whereas the more increasingly rural subwatersheds would be developed in years four and five because they exhibit less degradation. Middle Spencer, Westover and West Spencer Creeks were identified as priority subwatersheds because of the potential for land use practices in these areas to have a direct impact on the health of the greater watershed, Cootes Paradise Marsh, a provincially significant wetland found on the western coast of Lake Ontario and Hamilton Harbour. Maps of the Spencer Creek watershed and its subwatersheds, as well as a schedule for the development of future Stewardship Action Plans can be found within Appendix A, as excerpts from the HCA Stewardship Action Plans Work Plan (March 2007).

## **BACKGROUND**

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The purpose of the Spencer Creek Stewardship Action Plan is to create awareness by educating the public on the environmental issues within their local subwatershed, and to in turn, improve the ecological functions of the subwatershed through restoration initiatives. These plans provide a comprehensive strategy to support environmental watershed stewardship within the Spencer Creek subwatersheds by focusing on stewardship activities such as, education & awareness, habitat restoration and stress mitigation efforts. Additionally, these plans will help to guide sustainable development for the Spencer Creek watershed. Stresses acting on the subwatersheds, priority areas for restoration, and awareness needs of the communities are specifically identified within these plans.

The Spencer Creek Stewardship Action Plan began as a coordinated effort to protect and improve the health of the natural environment within the Spencer Creek watershed but is now serving as the model for subwatershed-based Stewardship Action Planning for the other major watersheds within HCA's jurisdictional boundaries as part of the larger Healthy Hamilton Watersheds Action Plan initiative.

### **MIDDLE SPENCER, WESTOVER AND WEST SPENCER CREEKS SUBWATERSHEDS**

The Middle Spencer, Westover and West Spencer Creeks subwatersheds are approximately 71 km<sup>2</sup>, or 26% of the Spencer Creek watershed's 279 km<sup>2</sup> area. The waters of Middle Spencer, Westover and West Spencer Creeks drain into Lower Spencer Creek subwatershed and ultimately the Cootes Paradise Basin. Cootes Paradise is a provincially significant coastal wetland located at the western end of Hamilton Harbour. Westover and West Spencer Creeks both flow into Middle Spencer Creek, where Middle Spencer Creek then flows into Lower Spencer Creek.

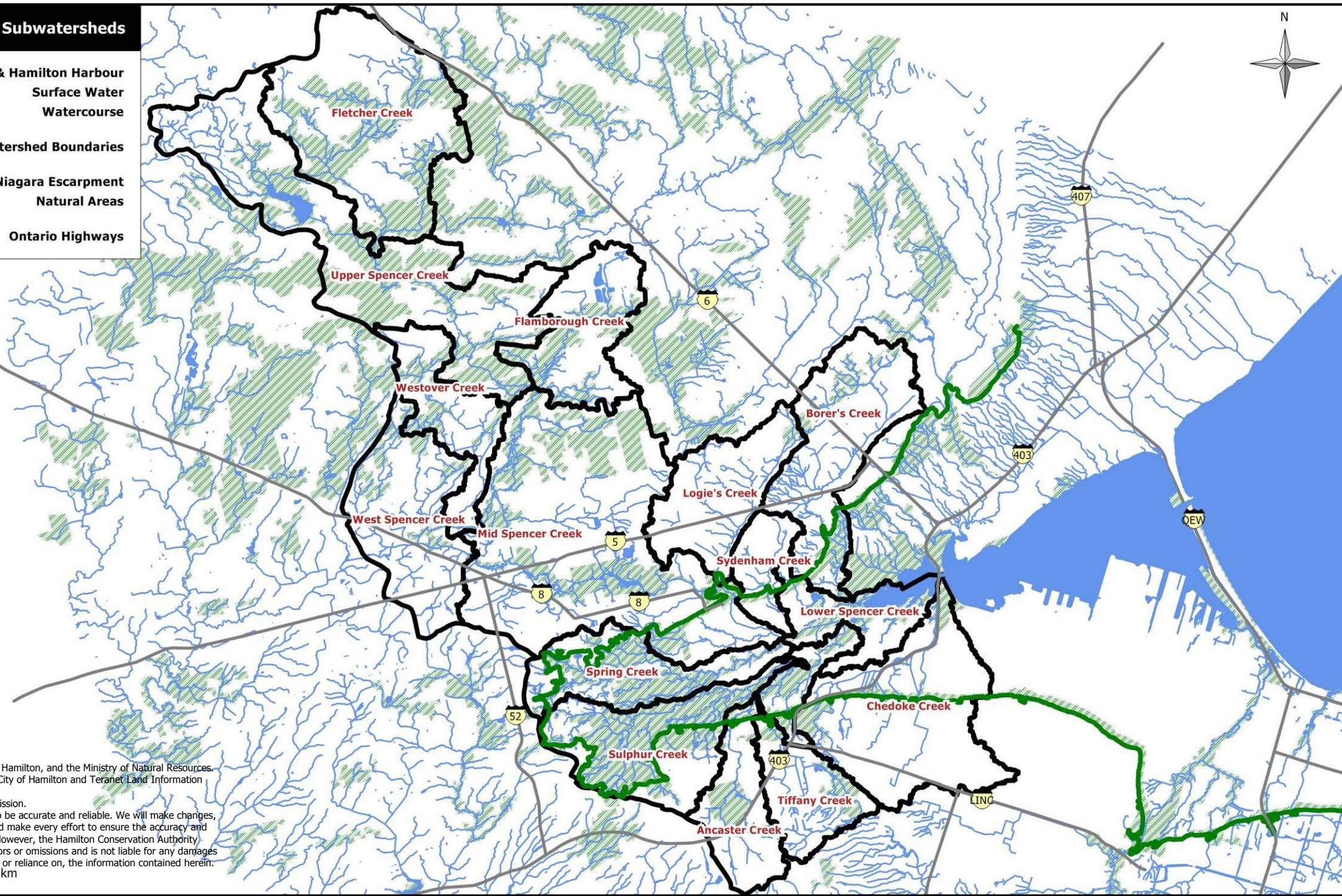
Middle Spencer, Westover and West Spencer Creeks are predominately agricultural with the exception of the settlement areas, most notably, Greensville and a portion of the town of Dundas. Below the Niagara Escarpment, the lower portion of Middle Spencer Creek is predominantly residential with supporting institutional, commercial and utility land uses present.

The agricultural lands have been identified for protection through the Greenbelt Plan and the City of Hamilton Official Plan. The natural lands have also been identified for protection in a number of legislated initiatives including the Niagara Escarpment Plan, Greenbelt Plan, City of Hamilton Official Plan and the HCA Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses Regulation. Due to protective legislation, greenfield development is not a significant issue in these subwatersheds.

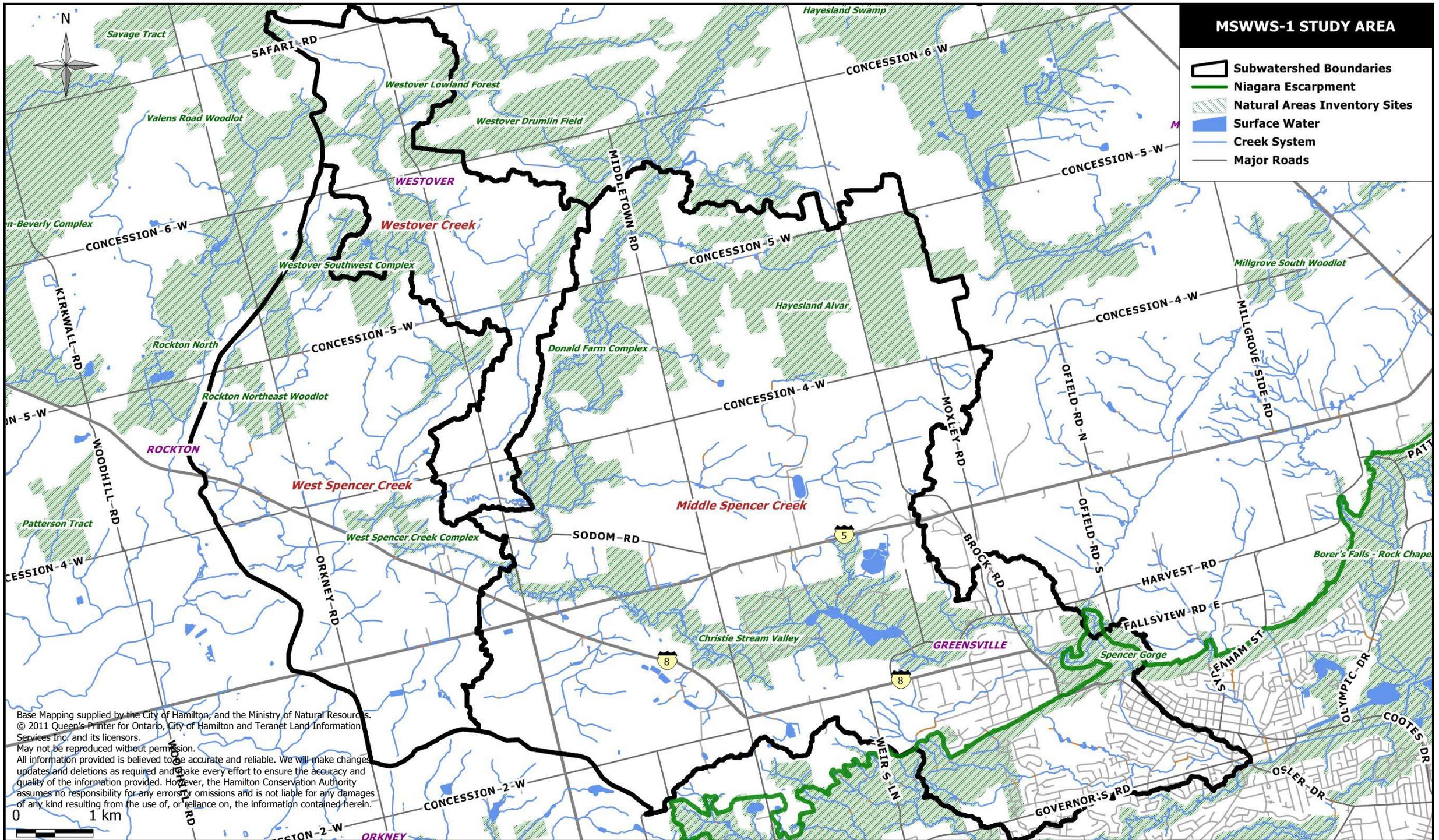
Common stresses noted within these plans that are observed to be impacting these three subwatersheds are: insufficient riparian buffers, water takings and on-line ponds.

# SP-1 Spencer Creek Subwatersheds

-  Cootes Paradise & Hamilton Harbour Surface Water
-  Watercourse
-  Subwatershed Boundaries
-  Niagara Escarpment Natural Areas
-  Ontario Highways



Base Mapping supplied by the City of Hamilton, and the Ministry of Natural Resources.  
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## PLAN LIMITATIONS

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Although measures were taken to complete a thorough analysis of the subwatersheds of Middle Spencer, Westover and West Spencer Creeks, some data were missing from this analysis as some research and monitoring has not been completed to date. The following is a list of the data gaps that are present in these plans. It is important that research and monitoring regarding the status of the following characteristics within these subwatersheds is undertaken and kept up-to-date in order to measure our success through the use of these plans. For more information on ecological and water quality assessments within the Middle Spencer, Westover and West Spencer subwatersheds, refer to the appendices.

### Data Gaps

- Stream morphology data (none)
  
- Erosion hot-spots and as it relates to development & natural occurrences
  
- Fisheries & benthics data
  - There are two annual fisheries and benthic monitoring stations in the Middle Spencer Creek subwatershed and there are five additional monitoring stations throughout all three subwatersheds that are sampled on a three-year cycle as part of the HCA Aquatic Resources Monitoring Program, however, the regular sampling of these stations began in 2006 when the Monitoring Program was initiated and as such additional years of data are needed to generate data suitable for trend analyses.
  - There are Source Water Protection surface water quality and flow sampling stations in all three subwatersheds; however the sampling of these sites began in 2006 and has since been discontinued.

- Water quality and quantity data
  - There are no stream level/flow gauges in the HCA Hydrometeorological Network in the Westover and West Spencer Creek subwatersheds.
  - There are no Provincial Water Quality Monitoring sampling stations in the Westover and West Spencer Creek subwatersheds.
  
- Abandoned groundwater well data
  - Data use in this report identifying abandoned groundwater wells was generated from the HCA groundwater well database associated with the 2004 Draft Hamilton Conservation Authority Groundwater Resources Study. This data has not been updated since 2004.

A complete list of all datasets used in the development of the Spencer Creek Stewardship Action Plans is included In Appendix F.

A public consultation process was initiated during the data collection phase of this project in an effort to solicit input from stakeholders representing the interests of the various sector groups operating in the study area. As a result, input into the plans is limited to those who opted to participate in the process.

Additionally all efforts were made to identify every current and anticipated stress within these subwatersheds, however the stresses identified within this document are not exhaustive and therefore there may be stresses located within these subwatersheds that are not noted within these plans. Occurrences of stresses identified after publication of this document should be reported to the Project Planner for inclusion in any addendums to this document.

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***The Stewardship Action Plans for the subwatersheds of Spencer Creek identify current and anticipated stresses that are impacting the natural environment within these subwatersheds. The Plans also include Stewardship Actions that have been developed to mitigate the impacts of these stresses. These plans are meant to be used by local agencies and groups as guides to deliver programs and services in these areas. The documents also identify lead agencies responsible for the implementation of each Action and list partner agencies that may support the Healthy Hamilton Watersheds Action Plan Implementation Team members in executing their Implementation Work Plans throughout the implementation period.***

***Specific locations of stresses identified through stakeholder input and GIS analyses are illustrated in detailed Catchment Maps. Descriptions of each stress and listings of appropriate Stewardship Actions are provided in corresponding Catchment Datasheets. Catchment datasheets also provide ecological and water quality monitoring data, if available, to provide users with an understanding of the “state” of the catchment prior to implementation.***

***The information reported within these documents was collected through public consultation, analyses using Geographical Information Systems and facilitated exercises undertaken by the Middle Spencer, Westover and West Spencer Creeks Stakeholder Advisory Committee.***

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Within each Stewardship Action Plan, stresses that are impacting local ecosystems at the subwatershed level have been identified. Specific occurrences relating to these stresses have also been identified, and are inventoried and described in detail for each catchment basin of each subwatershed. The specific occurrences of each stress have been categorized as current or anticipated stresses and are colour coded as such in the catchment basin mapping. The anticipated stresses are predominantly related to the potential for emergency issues with utility pipelines and proposed quarry expansions and as such may not be apparent at the present time, while current stresses are known to be impacting the local landscape presently. Specific attention should be paid to the implementation of stewardship actions associated with anticipated stresses as the prevention of degradation is a priority of these Stewardship Action Plans.

The details of each specific stress occurrence identified within the study area, have been incorporated into the Hamilton Conservation Authority's Restoration Opportunities Database. The database also houses supplementary detailed descriptions of each specific stress occurrence that was not included in the Stewardship Action Plans. The detailed descriptions were generated through the compilation of anecdotal information gathered during the stress identification exercise undertaken by the Middle Spencer, Westover and West Spencer Creeks Stakeholder Advisory Committee as well as through public consultation and primary research.

Through Stakeholder consultation, Stewardship Actions have been developed that address each type of stress identified. These Stewardship Actions are meant to guide the activities of local agencies and groups to prevent and mitigate the impacts of these stresses that are acting upon the natural environment of each subwatershed. The Stewardship Actions that have been developed include: Awareness Opportunities, Special Study Opportunities and Restoration Opportunities. Lists of local partner agencies to assist with the implementation of the Stewardship Actions are included with each Stewardship Action.

The themes of each of the Stewardship Actions are described below:

Awareness Opportunity: education and outreach opportunities involving residents, public and private landowners, and active associations / organizations

Special Study Opportunity: detailed analyses to better understand the events taking place in a specific location or area of the subwatershed or to develop or plan an initiative related to an issue identified.

Restoration Opportunity: on-the-ground restoration work

A Healthy Hamilton Watersheds Implementation Team has been established to carry out the Stewardship Actions identified within the Stewardship Action Plans for all subwatersheds of Spencer, Red Hill and Stoney/Battlefield Creeks; the Hamilton Conservation Authority will serve as the coordinating body for this effort. Biannual meetings will occur throughout each implementation year. Upon the completion of each Subwatershed Stewardship Action Plan,

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appropriate Subwatershed Stakeholder Advisory Committee members will join the Implementation Team, and as such the Stewardship Actions identified for those subwatersheds will be incorporated into the Implementation Team's work plan for the following year. Implementation Team meetings will be held in the following months of each year in order to discuss the topics noted:

### March

- Development of annual work plan, outlining Stewardship Actions to be initiated by each partner during the following implementation year.

### October

- Report on progress from each partner as to which Stewardship Actions were initiated and/or completed during the implementation year.

In most cases, the implementation of the Awareness Opportunity will need to precede all other Stewardship Actions developed. It is possible for any Special Study Opportunity to be implemented concurrently with an associated Awareness Opportunity; however Restoration Opportunities will be the final Stewardship Action to be completed for each stress identified.

Where applicable, implementation of Stewardship Actions should be undertaken on a subwatershed scale. Stewardship Actions that address specific occurrences of stresses identified within each of the subwatershed catchments should be undertaken concurrently. For example, the Awareness Opportunities associated with Detachment from Nature should be carried out over the entire subwatershed, followed by the Special Study and Restoration Opportunities that have been developed to address specific occurrences of Detachment from Nature.

The Stewardship Actions noted in these documents are guidelines to be used by the Implementation Team to define priorities as they relate to funding, budgeting and staffing requirements of each project. Stewardship Actions noted in this document can be modified by the Implementation Team as they see fit but should be used as a reference when determining appropriate measures in which to mitigate the stress at hand. Additionally, the Implementation Team will need to define detailed implementation strategies and in some cases site plans to follow through with the implementation of each Stewardship Action. The Restoration Opportunities Database can be used to target specific stress occurrences for

restoration related Stewardship Actions. Implementation Team members can seek out projects by querying the database using a variety of criteria including: stress type, suitable for DFO Compensation, public or private land, etc.

Assessing landowner motivation for participation in restoration activities will be key in determining remediation priorities. It is recommended that the assessment of landowner motivation be completed at the outset of implementation. This will aid in determining funding and staffing requirements for upcoming initiatives, as well as provide a knowledge base for working efficiently to achieve both landowner and partner goals.

It is suggested that the following methods be utilized and built-upon when approaching landowners.

### Landowner Contact Procedure Recommendations (private & public)

- Direct Contact
  - a. Door-to-door contact; deliver brochure with personalized explanation of reason for contact (stapled to brochure)
    - i. For those unavailable by door-to-door contact, leave a brochure and follow up with a mailed letter to landowner with additional information regarding the benefits to the environment and landowner
  - b. Phone landowner to set-up a site visit and/or to discuss their concerns in more detail
  - c. Add landowner to a contact list (mailing / phone) regarding relevant topics to their area or natural feature (workshops / educational sessions / activities in the area)
- Indirect Contact
  - a. At neighbourhood associations / community councils / rate-payers organizations (i.e. police associations) host:
    - ii. Information / education sessions,
    - iii. Workshops, and/or
    - iv. Deliver relevant literature

## ***ANNOTATED BIBLIOGRAPHY***

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### **City of Hamilton. GRIDS Master Plans**

The Growth Related Integrated Development Strategy (GRIDS) is a balanced growth strategy. Its purpose is to identify the most ideal places for growth and the type of growth based on environmental priorities, social issues, economic opportunities and population studies as well as to identify strategies to fund the servicing of these areas. GRIDS, approved by Council in May 2006, includes a strategy to accommodate a projected population of 700 000 and 100 000 additional households by 2031. Essentially is the implementation of the City's Vision 2020 Strategy. GRIDS is 'integrated' because it uses the model of sustainability to draw together land use planning and infrastructure investment planning (water, wastewater, stormwater and transportation) within a framework that considers social/cultural, environmental and economic implications of growth and development decisions. GRIDS brings together, into one process, all of the activities related to development. Coupled with a development staging plan, the strategy enables a more coordinated, time efficient and cost efficient investment process for the public and private sectors (see City of Hamilton. Staging of Development Program, Draft Document. Unpublished, November 2006).

**City of Hamilton, Planning and Economic Development. "Vacant Urban Residential Land Inventory." 19 Oct 2007. <http://www.myhamilton.ca/myhamilton/CityandGovernment/CityDepartments/PlanningEcDev/LongRangePlanning/InformationPlanning/Vacant+Urban+Residential+Land+Inventory.htm>**

This website provides maps and reports on a quarterly basis that updates the development of vacant urban residential lands (subdivision update being completed biannually). Vacant residential lands are based on secondary plans and the City's Official Plan and are therefore related to subdivisions and condominium developments. Vacant residential lands refer to lands with residential potential but with no draft plans submitted. These reports and maps include the development status for potential development, pending, draft approval, and registered plan. The reports contribute to stewardship actions by determining how many households are within a new development area and therefore how many contacts are needed and the best method in which to complete the awareness task.

**City of Hamilton. Staging of Development Program, Draft Document. Unpublished, November 2006.**

This document is a multi-purpose tool that has been prepared to establish the City's intention toward processing of plans of subdivision for residential and industrial development to draft plan approval and then to registration. This plan ensures that growth and staging conforms to the City's Official Plan and the Places to Grow Strategy. In addition to assisting the City and the development industry in determining where development is likely to occur between 2007, 2008, 2009 and beyond, this document will assist in the preparation of the Development Charge background studies and related activities, and highlights areas where the completion of planning studies and major capital works are required prior to development proceeding. This document is related to the City's GRIDS project, in meeting a strategy that is coordinated, time efficient and is a cost efficient investment process for the public and private sectors. The Development Engineering section of the Planning and Economic Development Department with input from internal divisions, the Public Works Department, Corporate Services Department and the development industry is responsible for preparing this report on a yearly basis for Council approval and documents the City's intention for processing and registration of subdivision applications. This report includes the staging plan preparation and process, as well as maps illustrating the development staging plan, subdivision plan detail sheets, unbuilt unit and blocks counts for each plan of subdivision, existing secondary plans, and master plans and major engineering studies. This report contributes to stewardship actions by determining upcoming contact targets for new subdivisions and condominiums.

**Dwyer, J. et al. Nature Counts: Hamilton Natural Areas Inventory. Hamilton Naturalists' Club, 2003.**

This document is a biological inventory of natural areas within the City of Hamilton. Biologists identified plants, animals, birds, butterflies, fish and other significant species living in each natural area which in turn have identified areas of important habitat in need of protection. The inventory is meant to serve as a benchmark against which changes in the environmental health of the habitats can be measured as changes on the landscape take place. The Inventory provided the framework for determining the qualifying criteria for Environmentally Significant Areas identified in the study area.

## **ANNOTATED BIBLIOGRAPHY**

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**Greater Toronto Conservation Authorities. Erosion and Sediment Control Guidelines for Urban Construction. Greater Toronto Conservation Authorities. March 2006.**

This document was prepared from various erosion and sediment control guideline references applied by municipal and provincial agencies within the Greater Toronto Area to guide and review erosion and sediment control practices within their jurisdiction. The application of these guidelines is intended to protect and preserve water quality, aquatic and terrestrial habitats and form and function of natural water resources. It also aims to provide a consistent approach to erosion and sediment control to provide greater certainty to practitioners and to improve environmental protection.

**Hamilton Conservation Authority. A.C.T.! A Work Plan for Ancaster, Chedoke & Tiffany Creeks Stewardship Action Plans. Watershed Planning & Engineering Division, March 2007.**

The A.C.T. work plan outlines the goals specific to all of the Spencer Creek Stewardship Action Plans, as well as goals specific to the Ancaster, Chedoke and Tiffany Creek Stewardship Action Plans. The document also outlines the Plan Development Phases and actions to be taken during each phase, which were followed during the development of the Ancaster, Chedoke and Tiffany Creek Stewardship Action Plans. This work plan will also be the guiding document for the methodology of the development process for the remaining twelve Subwatershed Stewardship Action Plans that are to be developed for the Spencer Creek Watershed.

**Hamilton Conservation Authority. Hamilton Waterfalls & Cascades, Edition 2. Watershed Planning & Engineering Division. November 2007.**

This report outlines the set of criteria for examining waterfalls in the City of Hamilton which was used to inventory each waterfall in Hamilton that met these criteria and to evaluate and rank these waterfalls from a visitors' perspective. This information is used to provide updated and consistent information, as well as coordination and guidance, for the Waterfalls Project Advisory Team and their parent organizations so that educated decisions will be made in regards to Hamilton's waterfall visitor potential. This report also provides an international benchmark to which others can define or identify a waterfall.

**Hamilton Region Conservation Authority. Spencer Creek Watershed Management Plan. December 1997.**

This report was completed in cooperation with a variety of local Stakeholders, including community organizations and government agencies. This Management Plan is an integrated watershed management plan for the Spencer Creek ecosystem. The project incorporated a review of data and qualitative data gathered over 30 years by the Hamilton Conservation Authority as well as data and information from other agencies in the watershed. The development process included public consultation as well as reviews by the steering committee and technical working groups. The plan has been endorsed by the Hamilton Conservation Authority and the local municipalities. The Plan identifies the natural environmental attributes of the watershed and recommends appropriate strategies for the protection, restoration and enhancement of the features with consideration for the social and economic needs of the watershed residents. The plan also includes implementation and monitoring strategies.

**Hamilton Region Conservation Authority. Aquatic Resource Monitoring Program. 2004.**

The Aquatic Resource Monitoring Program outlines the protocol for routine monitoring of fish, fish habitat and benthic macroinvertebrates throughout the watersheds of the Hamilton Conservation Authority. The program assists HCA staff in identifying areas within the watersheds where net gains in fish habitat can be undertaken, thereby increasing the productive capacity of the fishery within the watersheds. The ARMP focuses on monitoring parameters that are indicators of ecological health.

**Hamilton-Halton Watershed Stewardship Program. Watershed Riparian Buffer Mapping & Analysis using GIS. Hamilton Conservation Authority, 2003.**

Based on 1999 ortho-rectified aerial photography riparian buffers were digitized and analyzed. This data was not used within this study due to the inaccuracies that exist between 1999 and 2007. However this document will give a general idea of the riparian habitat within the ACT! watershed and will also serve as a guideline for future riparian buffer analysis.

## **ANNOTATED BIBLIOGRAPHY**

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**O'Connor, K. M. Remedial Action Plan for Hamilton Harbour: Stage 2 Update 2002. Hamilton Harbour RAP Stakeholder Forum, 2003.**

This document examines the works completed as of 2002, undertaken in an effort to reach the Hamilton Harbour Remedial Action Plan objectives, and ultimately the delisting of the Hamilton Harbour as an Area of Concern by 2015. This document resulted from the recall of the RAP Stakeholder Group, now called the RAP Forum, to the task of reviewing water quality, toxic contamination, fish and wildlife, land management and public access data and comparing it against the baseline data submitted by the RAP Stakeholders in the Stake 1 Report to the International Joint Commission in 1989. Task groups made up of scientists and Stakeholders reported findings to the forum and these reports were used as the basis for modifying the original report.

**Royal Botanical Gardens, Cootes to Escarpment Park System – A Conservation and Land Management Strategy. Unpublished, October 2009.**

The strategy is intended to guide the management of natural resources in the public interest in an effort that they remain healthy in the rapidly urbanizing landscape and that they be preserved so that they can provide necessary green infrastructure for future residents so that they may live in healthy communities. This strategy also acknowledges that private landowners will be integral in the protection of these natural areas. The strategy presents a vision of how these lands contribute to sustaining our community for the long term. It is the intention of this strategy that it be used to guide a coordinated effort to manage the natural areas within the study area to ensure their wise use and protection.

**Source Water Protection Halton-Hamilton Region, Preliminary Watershed Description Report: Hamilton Conservation Watersheds. Unpublished, January 2006.**

The preliminary watershed description is a detailed examination of the physical and human characteristics of the Source Water Protection Planning Region, specifically the Hamilton and Halton Conservation Authorities' respective jurisdictions. Numerous maps and tables support a textual report on what makes up the watershed. Topics include population, geology, vegetation, land use, infrastructure, government, hydrology, physiography, hydrogeology, etc.

**Source Water Protection Halton-Hamilton Region, Preliminary Conceptual Water Budget Report. Unpublished, October 2006.**

This report outlines the conceptual understanding of the water budget for the Hamilton Conservation Authority watersheds. The water budget aims to describe water movement and water uses within the watersheds. Using available data, this report includes a conceptual understanding of a variety of natural features within the watersheds including: climate, geology, physiography, land cover, groundwater, surface water, etc. as they are elements of the water budget for the watersheds. The data in this report will be used to complete models of the hydrologic systems of the watersheds for the purposes of the Source Water Protection initiative.

**Thomson, T.M. The Spencer Story. Spencer Creek Conservation Authority, 1965.**

This publication outlines the history of the Spencer Creek Watershed and the origin of the Hamilton Conservation Authority as the agency responsible for its management. Topics addressed in this historical account of the watershed are: physiography, cultural heritage, land use, flooding and the installation of flood control structures, natural heritage, recreation and an account of the founding years of Spencer Creek Conservation Authority.

**The Tourism Company and The Rethink Group. A Joint Outdoor Tourism Marketing Strategy. Golden Horseshoe Conservation Authorities, December 1995.**

This report is the result of the Golden Horseshoe Conservation Authorities collaboration on marketing strategies and identifying new opportunities for revenue generation. The report recognizes the growth in demand for outdoor recreation and specialty outdoor experiences. The report includes a marketing audit, research on potential new markets and a cooperative marketing strategy, clearly defining tourism packages and implementation priorities. The Marketing Strategy section of this report provides a vision, strategic marketing statement and a three year marketing plan in an effort to capitalize on the opportunities identified. Two of the guiding principles in the strategy include: increasing revenues and enhancing the quality of visitor experiences while maintaining the conservation ethic and recognizing the need for ecologically sustainable tourism.

## ***ANNOTATED BIBLIOGRAPHY***

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**Hamilton Harbour Remedial Action Plan, Identifying Non Point Sediment Sources Report. Unpublished, November, 2009.**

This report outlines a general overview of major sediment conditions and identifies significant sources of sediment resulting from specific locations or areas of the watersheds of Hamilton Harbour. Urban development sites are excluded from this document as they are addressed in specific sediment control initiatives of the municipalities and conservation authorities.

**Source Water Protection Halton-Hamilton Region, Draft Threat Assessment Report. Unpublished, September, 2010.**

This report builds upon earlier characterization reports and water budgets and assesses the availability and use of water supplies in the Halton-Hamilton Source Protection Area. It includes water quantity risk assessments that identify areas requiring further study. It also assesses threats to water quality from ongoing, potential or past activities. This document will be the foundation for the development of the Source Protection Plan for the Halton-Hamilton Source Protection Region.

**Source Water Protection Halton-Hamilton Region, Draft Tier 1 Water Budget Report. Unpublished, November, 2008.**

This report outlines the conceptual understanding of the water budget for the Hamilton Conservation Authority watersheds and uses this data to assess the level of stress imposed upon this system. This report includes the results of preliminary models used to determine the location and breadth of vulnerable groundwater aquifers and drinking water supplies that are under significant or moderate levels of stress. This information will trigger or exempt locations from the Tier 2 and 3 assessments as directed by the source protection planning process.

## ***APPENDICIES***

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**APPENDIX A** - MAP OF SPENCER CREEK WATERSEHD AND STEWARDSHIP ACTION PLAN DEVELOPMENT SCHEDULE

**APPENDIX B** – HISTORICAL FISHERIES INVENTORY

**APPENDIX C** - SIGNIFICANT SPECIES

**APPENDIX D** - WATER QUALITY ASSESSMENT AT MIDDLE SPENCER, WESTOVER AND WEST SPENCER CREEKS

**APPENDIX E** - SURFACE WATER FLOW ASSESSMENT MIDDLE SPENCER, WESTOVER AND WEST SPENCER CREEKS

**APPENDIX F** - DATA SOURCES