

BORER'S, LOGIE'S AND SYDENHAM CREEKS STEWARDSHIP ACTION PLANS

Part of the Spencer Creek Stewardship Action Plans 2009



Endorsed by the HCA Board of Directors
March 2009

STEWARDSHIP ACTION PLANS: Borer's, Logie's and Sydenham Creeks
Part of the Spencer Creek Stewardship Action Plans
March 2009

Prepared by: Jaime Overy,
Spencer Creek Stewardship Planner



838 Mineral Springs Rd., PO Box 7099
Ancaster (Hamilton), ON L9G 3L3
T: 905-525-2181
F: 905-648-4622
www.conservationhamilton.ca

ACKNOWLEDGEMENTS

The Hamilton Conservation Authority would like to extend its thanks to the individuals and organizations that provided representation for the Borer's, Logie's and Sydenham Creeks Stakeholders Advisory Committee. These individuals guided and provided valuable input into the development of these plans.

BORER’S, LOGIE’S AND SYDENHAM CREEKS STAKEHOLDERS ADVISORY COMMITTEE MEMBERS

<i>Name</i>	<i>Representation</i>	<i>Position (if applicable)</i>
Adam Bienenstock	Gardens for Living	Founder and Principal Designer
Brad Nimijohn	Wentworth Soil and Crop	Director
Darren Kenny	Hamilton Conservation Authority, Planning	Watershed Officer
Cherish Elwell	Hamilton-Halton Watershed Stewardship Program (Hamilton Conservation Authority)	Watershed Stewardship Technician
Elizabeth Panicker	City of Hamilton	Project Manager
Janet Wong	Royal Botanical Gardens	Cootes to Escarpment Strategy Project Manager
Jim Hudson	Bay Area Restoration Council	Executive Director
John Hall	Hamilton Harbour Remedial Action Plan	Coordinator
John MacLennan	Borer’s Creek Resident	Citizen
Kathryn Gold	Green Venture	Wise Water Use Coordinator
Lisa Jennings	Hamilton Conservation Authority, Ecology	Acting Ecologist
Lorraine Norminton	Hamilton-Wentworth Stewardship Council (Ministry of Natural Resources)	Coordinator
Mike Williams	Ducks Unlimited	Conservation Specialist
Matt Wilson	Ontario Ministry of Agriculture Food and Rural Affairs	Environmental Specialist
Patrick Ragaz	Hamilton Conservation Authority, Engineering	Water Resources Engineer
Sanja Ivanovic	City of Hamilton	Project Intern
Sheila O’Neal	Hamilton-Halton Watershed Stewardship Program (Hamilton Conservation Authority)	Program Manager
Shelly Dunn	Fisheries and Oceans Canada	Fish Habitat Biologist
Tys Theysmeyer	Royal Botanical Gardens	Aquatic Ecologist

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.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....i - xxi

 SUMMARY.....i

 STATISTICS OF STRESSES IDENTIFIED IN EACH SUBWATERSHED.....ii

 SUMMARY TABLE OF STEWARDSHIP ACTIONS DEVELOPED.....iv

 MAP OF STUDY AREA.....xx

FOREWARD.....xxi

BACKGROUND.....xxii - xxv

 BACKGROUND.....xxii

 MAP OF SPENCER CREEK WATERSHED.....xxiv

 MAP OF BORER’S, LOGIE’S AND SYDENHAM CREEK SUBWATERSHEDS.....xxv

PLAN LIMITATIONS.....xxvi

IMPLEMENTATION STRATEGY.....xxvii - xxviii

ANNOTATED BIBLIOGRAPHY.....xxix - xxxii

BORER’S CREEK STEWARDSHIP ACTION PLAN.....BO 1 - 46

LOGIE’S CREEK STEWARDSHIP ACTION PLAN.....LO 1 - 39

SYDENHAM CREEK STEWARDSHIP ACTION PLAN.....SY 1 - 37

APPENDICIES (AVAILABLE AT THE HAMILTON CONSERVATION AUTHORITY MAIN OFFICE)

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

 APPENDIX B - FISHERIES INVENTORY

 APPENDIX C - SIGNIFICANT SPECIES

 APPENDIX D - WATER QUALITY ASSESSMENT AT BORER’S AND LOGIE’S CREEKS

 APPENDIX E - SURFACE WATER FLOW ASSESSMENT AT BORER’S AND LOGIE’S CREEK

 APPENDIX F - DATA SOURCES

 APPENDIX G - SPENCER CREEK MEDIA COVERAGE

EXECUTIVE SUMMARY

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.

Local stakeholders have jointly developed comprehensive Stewardship Action Plans for the Borer’s, Logie’s and Sydenham 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.

- 27 stresses were identified as impacting our natural environment on a subwatershed scale.
- 145 specific occurrences of stresses were identified at locations throughout the subwatersheds, 84 are in Borer’s Creek, 29 in Logie’s Creek and 32 in Sydenham Creek.
- 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. Storm-sewer outfalls, habitat fragmentation, on-line ponds, outdoor recreation related degradation and Insufficient riparian buffers are commonly ranked as the most prevalent stresses in all three subwatersheds.
- 129 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 Borer’s, Logie’s and Sydenham Creeks Subwatersheds Summary Table on pages iv – xxiv for detailed descriptions of each Stewardship Action.

Partners identified in the Borer’s, Logie’s and Sydenham Creeks Stewardship Action Plans are encouraged to join the 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 entire Spencer Creek watershed as they are completed on a subwatershed basis over a five year period.

EXECUTIVE SUMMARY – STRESS INVENTORY TABLES

**TABLE 1 BORER’S CREEK SUBWATERSHED
84 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
Stormsewer Outfalls	SO	22
Habitat Fragmentation	HF	14
On-line Ponds	OP	9
Outdoor Recreation Related Degradation	OR	7
Insufficient Riparian Buffer	RB	7
Runoff Contamination via Transportation Corridors	TC	5
Channelization	CH	5
Pesticide Use	PS	3
Litter	LI	3
Increased Impervious Surfacing	IS	3
Dams	DM	3
Detachment from Nature	DT	3
Erosion	ER	3
Encroachment	EN	2
Buried Streams	BS	1
Invasive/Introduced Species	IV	1
Nutrient Loading	NL	1
Plowed Watercourses	PW	1
Transportation Corridor Expansion	TE	1
Faulty Septic Systems	SS	None identified
Illegal Fill Placement	FP	None identified
Inadequate Stormwater Management	SW	None identified
Perched Culverts	CP	None identified
Sediment Loading	SL	None identified
Site Clearing Prior to Development	SC	None identified
Water Takings	WT	None identified
Wildlife Collisions	WC	None identified


**TABLE 2 LOGIE’S CREEK SUBWATERSHED
29 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
On-line Ponds	OP	7
Water Takings	WT	6
Habitat Fragmentation	HF	5
Insufficient Riparian Buffer	RB	4
Outdoor Recreation Related Degradation	OR	2
Buried Streams	BS	1
Channelization	CH	1
Faulty Septic Systems	SS	1
Increased Impervious Surfacing	IS	1
Sediment Loading	SL	1
Dams	DM	None identified
Detachment from Nature	DT	None identified
Encroachment	EN	None identified
Erosion	ER	None identified
Illegal Fill Placement	FP	None identified
Inadequate Stormwater Management	SW	None identified
Invasive/Introduced Species	IV	None identified
Litter	LI	None identified
Nutrient Loading	NL	None identified
Perched Culverts	CP	None identified
Pesticide Use	PS	None identified
Plowed Watercourses	PW	None identified
Site Clearing Prior to Development	SC	None identified
Stormsewer Outfalls	SO	None identified
Runoff Contamination via Transportation Corridors	TC	None identified
Transportation Corridor Expansion	TE	None identified
Wildlife Collisions	WC	None identified

EXECUTIVE SUMMARY – STRESS INVENTORY TABLES


**TABLE 3 SYDENHAM CREEK SUBWATERSHED
32 STRESSES IDENTIFIED**

STRESS	MAP CODE	NO. IN SUBWATERSHED
Stormsewer Outfalls	SO	9
Outdoor Recreation Related Degradation	OR	4
Erosion	ER	2
Habitat Fragmentation	HF	2
Inadequate Stormwater Management	SW	2
Increased Impervious Surfacing	IS	2
Insufficient Riparian Buffer	RB	2
Litter	LI	2
Runoff Contamination via Transportation Corridors	TC	2
Buried Streams	BS	1
Channelization	CH	1
Pesticide Use	PS	1
Detachment from Nature	DT	1
Encroachment	EN	1
Dams	DM	None identified
Faulty Septic Systems	SS	None identified
Illegal Fill Placement	FP	None identified
Invasive/Introduced Species	IV	None identified
Nutrient Loading	NL	None identified
On-line Ponds	OP	None identified
Perched Culverts	CP	None identified
Plowed Watercourses	PW	None identified
Sediment Loading	SL	None identified
Site Clearing Prior to Development	SC	None identified
Transportation Corridor Expansion	TE	None identified
Water Takings	WT	None identified
Wildlife Collisions	WC	None identified


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


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


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


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


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


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

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
Increased Impervious Surfacing Map Code: IS  Definition: The decreased potential for rainwater infiltration into the soil as a result of increased paved/impermeable surfacing.	Host training sessions for HCA and City staff, developers and consultants to promote the incorporation of development related BMP's into planning applications; e.g. permeable pavement, green roofs, on-site wastewater treatment, etc.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM -5b, ULM-6 Page 71, 72 HCA Planning and Regulation Policies and Guidelines Pages 74-77 Fisheries Act, Section 34 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 38-44, 93-97, 122-125, 158-162	HCA / CITY / HHHBA / Landscape Ontario	HCA / CITY	2010-2014
	Lobby the Provincial government to amend the building code to include and favour "green" technology; e.g. green roofs, multilevel parking, interlocking pavement, etc.				HCA / CITY / EH / HHHBA / GV / Landscape Ontario	CITY	2010-2014
	Create demonstration sites in subdivisions that highlight development related BMP's and new environmentally friendly technologies; e.g. permeable pavement, green roofs, on-site wastewater treatment, etc.				HCA / CITY / EH / HHHBA / GV / HHWSP / HWSC	HHHBA	2010-2014
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the implementation of development related BMP's and new environmentally friendly technologies when undertaking home renovations.				HCA / CITY / GV / HHHBA / HHWSP	GV	2010-2014
Invasive/Introduced Species Map Code: IV Definition: The establishment/proliferation of exotic species that have no natural control	Host training sessions for City staff, landscapers, consultants and nurseries to create awareness regarding the detrimental effects of invasive species and to encourage the use of native species.			HCA Planning and Regulation Policies and Guidelines Pages 53-56, 70-71 Action Plan for Addressing Terrestrial Invasive Species within the Great Lakes Basin	HHWSP / HCA / HWSC / CITY / HNC / Landscape Ontario	HCA	2010-2011
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding the importance of controlling invasive species and planting native species.				HHWSP / HCA / HWSC / CITY	HHWSP	2010-2014


STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
measures which compete with native species for resources and degrade the ecosystem.		Develop an Invasive Species Management Program which includes monitoring sites and management for specific species.			HCA / HHWSP / MNR / HWSC / CITY / HNC / RBG / CC	HCA	2010-2013
			Work with landowners to control invasive species and plant native species.		HCA / CITY / HHWSP / RBG	HHWSP	2010-2014
Insufficient Riparian Buffer Map Code: RB 	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote healthy streams and the creation of larger riparian buffers.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-2 Page 69	DFO / HCA / HHWSP / BARC / HWSC / OSCIA / OMAFRA	HHWSP	2010-2014
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.			HCA Planning and Regulation Policies and Guidelines Pages 40, 55, 60	HCA / HHWSP / HWSC / OSCIA / OMAFRA	OSCIA	2010-2014
	Create demonstration sites that highlight riparian buffers.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 145-150, 162-163	DFO / HCA / HHWSP / BARC / HWSC / OSCIA / OMAFRA	HHWSP	2010-2012
			Work with landowners to naturalize and plant riparian buffers adhering to How Much Habitat is Enough guidelines of a15m width adjacent to warm water streams and a 30m width adjacent to cold and cool water streams.	Cootes to Escarpment Conservation & Land Management Strategy	HCA / HHWSP / HWSC / OSCIA / FSRT / DFO	HHWSP / OSCIA	2010-2014
Litter Map Code: LI Definition: The act of illegally disposing of waste into public/natural areas.	Utilize literature, websites, public service announcements, & direct landowner contact to create awareness regarding the prevention and clean-up of litter.			City of Hamilton By-law No. 03-118 Litter, Yard Waste and Property Maintenance	HCA / RBG / CITY / GV	CITY	2010-2014
		Undertake an inventory of illegal dumping sites throughout the subwatershed. Prioritize sites for the installation of deterrent mechanisms and the implementation of the Keep Hamilton Clean Program.			HCA / CITY / RBG	CITY	2010-2014


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

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


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

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

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

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

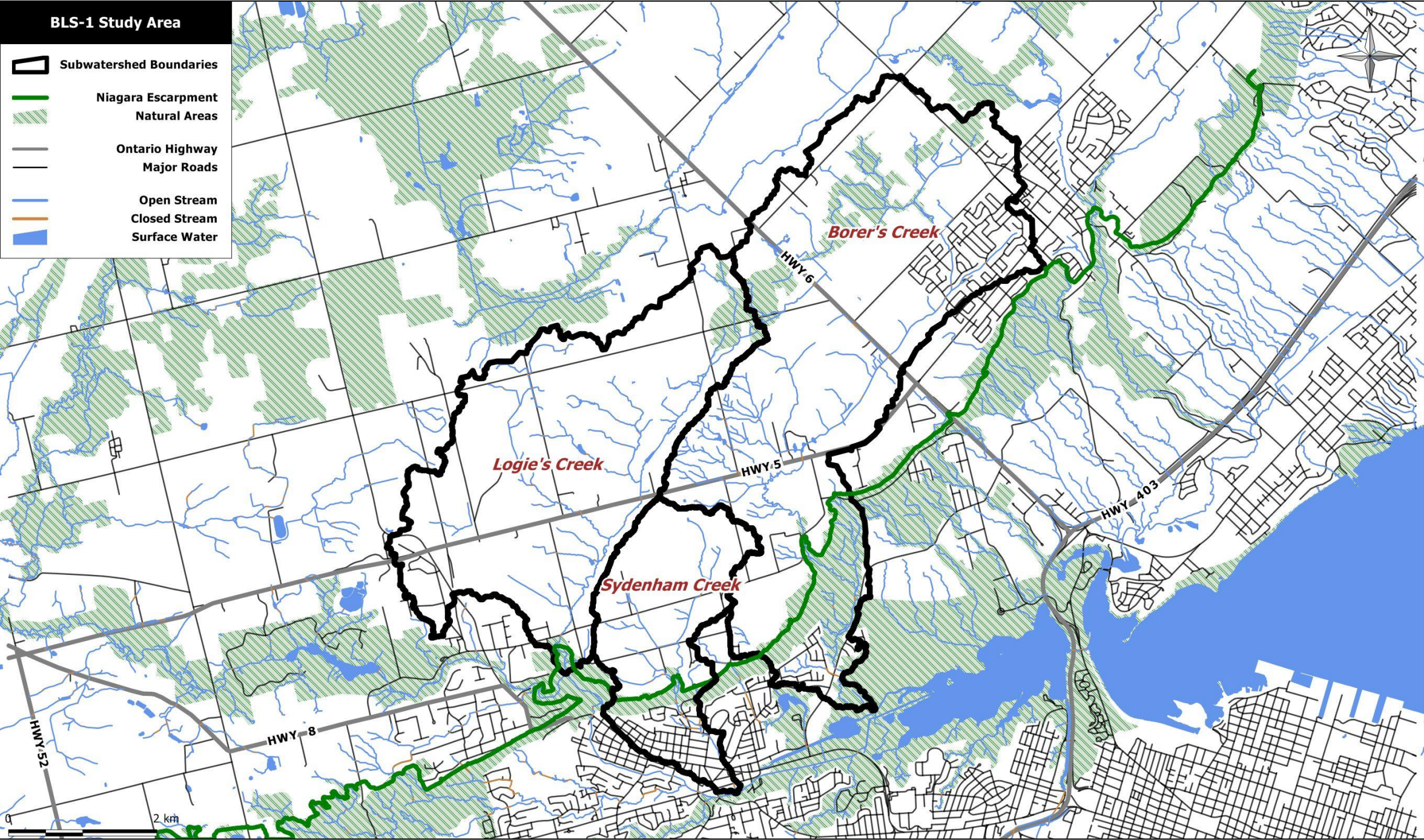
STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
associated with the application of salts for de-icing and the residual precipitate created by automobile exhaust.		Undertake a study to determine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

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
 <p>Definition: The process by which surface and groundwater are pumped out of the natural system; for the purposes of irrigation, aggregate extraction, etc.</p>	Encourage landowners with water taking needs to establish an Irrigation Advisory Committee to schedule takings alternately.				HHWSP / OSCIA / MOE / OMAFRA	OMAFRA	2010-2014
		Upon receipt of new Permit to Take Water applications, evaluate the taking against active permits in the area to determine the potential stress level related to multiple users on a given system.			HCA / MOE / CITY	HCA	2010-2014
			Work with landowners to implement BMP's related to water conservation.		HCA / OSCIA / CITY / HWSC / HHWSP / OMAFRA	OSCIA	2010-2014
			Work with landowners to decommission unused wells.		HCA / HHWSP / OSCIA / CITY	HHWSP	2010-2014
<p>Wildlife Collisions</p> <p>Map Code: WC</p> <p>Definition: Incidences where animals are struck by vehicles or where animals collide with buildings, often occurring with buildings with large windows.</p>	Utilize literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding managing human-wildlife conflicts.				CITY / MNR / HHWSP / HWSC / HCA	MNR	2010-2014
	Erect additional wildlife caution signage that is species specific, along roadways at known points of frequent collisions.				CITY / HCA / RBG / MTO	CITY / MTO	2010-2014
		When planning major road works, consider the incorporation of wildlife over/underpasses, avoiding known migratory corridors and other wildlife accommodations in the design.			CITY / HCA / MTO	CITY	2010-2014
		Evaluate the effectiveness of the MTO roadside prairies and wildlife shrub corridors project in preventing wildlife collisions.			CITY / HCA / MTO	MTO	2010-2012
			Reduce the use of road salt or consider alternatives that do not attract wildlife.		CITY / HCA / MTO	CITY	2010-2011

STRESSES	STEWARDSHIP ACTIONS			RELATED DOCUMENTS	PARTNER AGENCIES	LEAD AGENCY	TIMELINE
	Awareness Opportunity	Special Study Opportunity	Restoration Opportunity				
			Produce and distribute window decals for large windows of homes and high rise buildings to prevent bird collisions.		CITY / HCA / HNC / GV	CITY	2010-2011

Partner Agency Acronyms

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



BORER'S, LOGIE'S AND SYDENHAM CREEKS STEWARDSHIP ACTION PLANS

FOREWARD

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.

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

SPENCER CREEK WATERSHED

The Spencer Creek watershed is the largest watershed within the jurisdiction of the Hamilton Conservation Authority (HCA) at 279 km², 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 6th 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 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.

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 watershed makes up 57% of the Hamilton Harbour watershed.

The Hamilton-Halton Watershed Stewardship Program is a joint program between the HCA and Conservation Halton. It began in 1994 in cooperation with the Bay Area Restoration Council (BARC) in order to deliver education outreach and complete restoration projects that will directly contribute to the HHRAP efforts as they relate to private landowners within the Hamilton Harbour watershed. This program has effectively created environmental awareness on various issues including the importance of riparian buffers, terrestrial and aquatic habitats, species at risk, water quality, and septic and well water education. Additionally, restoration projects involving water quality improvement and habitat restoration have been completed and annual environmental monitoring protocols have been implemented. This work has been completed by undertaking direct landowner contact by: mail, telephone, door-to-door campaigns, open houses and issue specific workshops. To date this program has contacted landowners of over 1800 properties within the Spencer Creek watershed and more specifically over 200 within the Borer's, Logie's and Sydenham Creeks subwatersheds. Of these landowners contacted, 254 have entered into hand-shake agreements to remain watershed stewards, 30 of these are within the

BACKGROUND

Borer’s, Logie’s and Sydenham Creeks subwatersheds. The Spencer Creek watershed makes up 19% of the Hamilton-Halton Watershed Stewardship Program’s jurisdiction.

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. More specifically, Borer’s, Logie’s and Sydenham Creeks were identified as priority subwatersheds because of their urban areas and their direct impact on the health of Cootes Paradise Marsh, a

BORER’S, LOGIE’S AND SYDENHAM CREEKS SUBWATERSHEDS

The Borer’s, Logie’s and Sydenham Creeks subwatersheds are approximately 38 km², or 13% of the Spencer Creek watershed’s 279 km² area. The waters of Borer’s, Logie’s and Sydenham Creeks drain into the Cootes Paradise Basin. Cootes Paradise is a provincially significant coastal wetland located at the western end of Hamilton Harbour. While Logie’s and Sydenham Creeks feed directly into the main branch of Spencer Creek, Borer’s Creek does not as it technically a subwatershed separate of the Spencer Creek system. However for the purpose of this study it has been included within the Spencer Creek watershed as was the case in the existing Spencer Creek Watershed Management Plan (HCA, 1997).

Of the fifteen subwatersheds of Spencer Creek, Borer’s, Logie’s and Sydenham Creeks are relatively urbanized and have been targeted for increased development and urban intensification in the Growth Plan for the Greater Golden Horseshoe (2006) and the Greenbelt Plan (2005). In response to the strict urban boundaries being defined within the City of Hamilton as a result of these recently passed legislations, the City has developed the Growth Related Integrated Development Strategy (GRIDS) which aims to meet

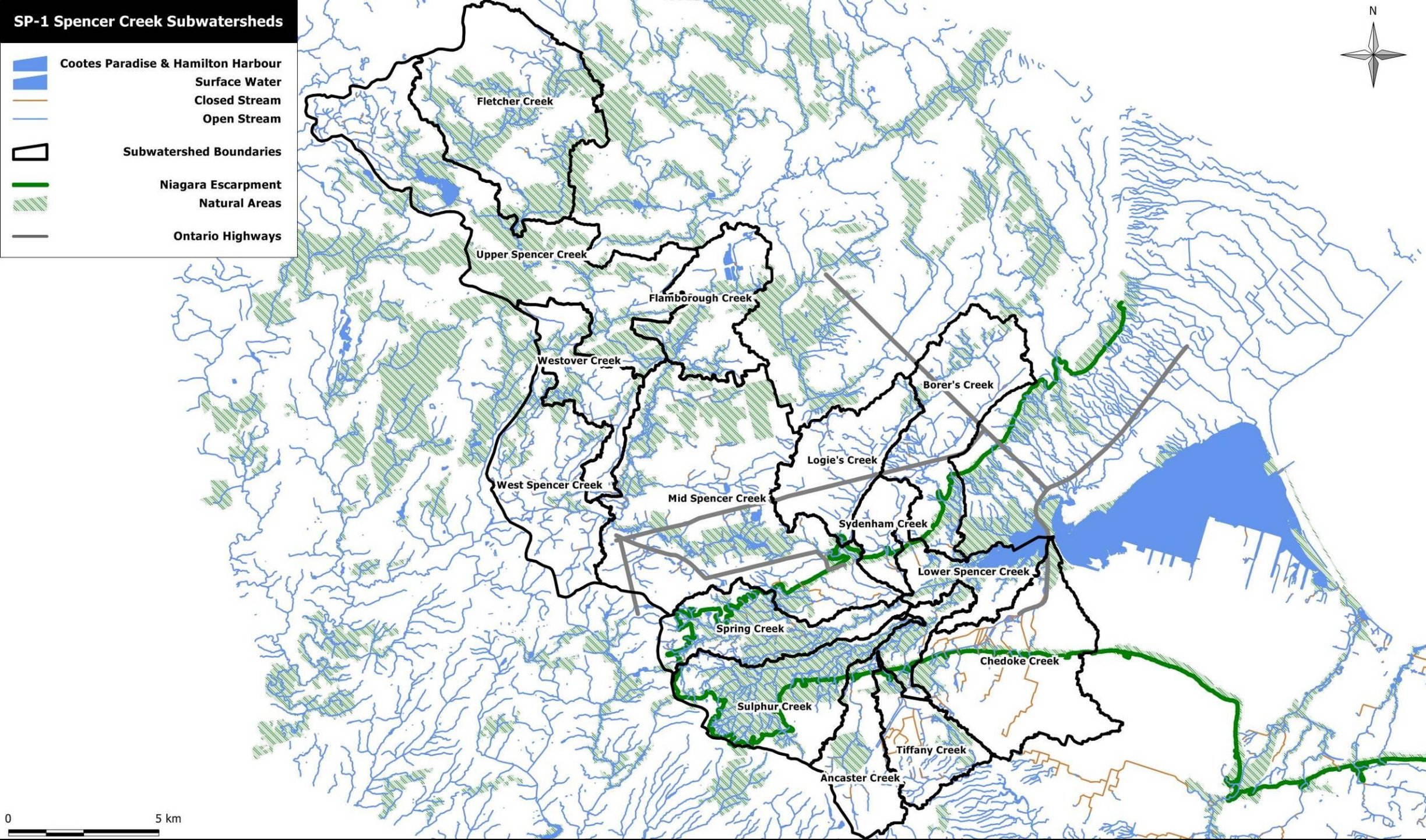
provincially significant wetland found on the western coast of Lake Ontario and adjacent to Hamilton Harbour. Maps of the Spencer Creek watershed and its subwatersheds, as well as a schedule for the development of future Stewardship Action Plans can be found within Appendix A, as excerpts from the HCA Stewardship Action Plans Work Plan (March 2007).

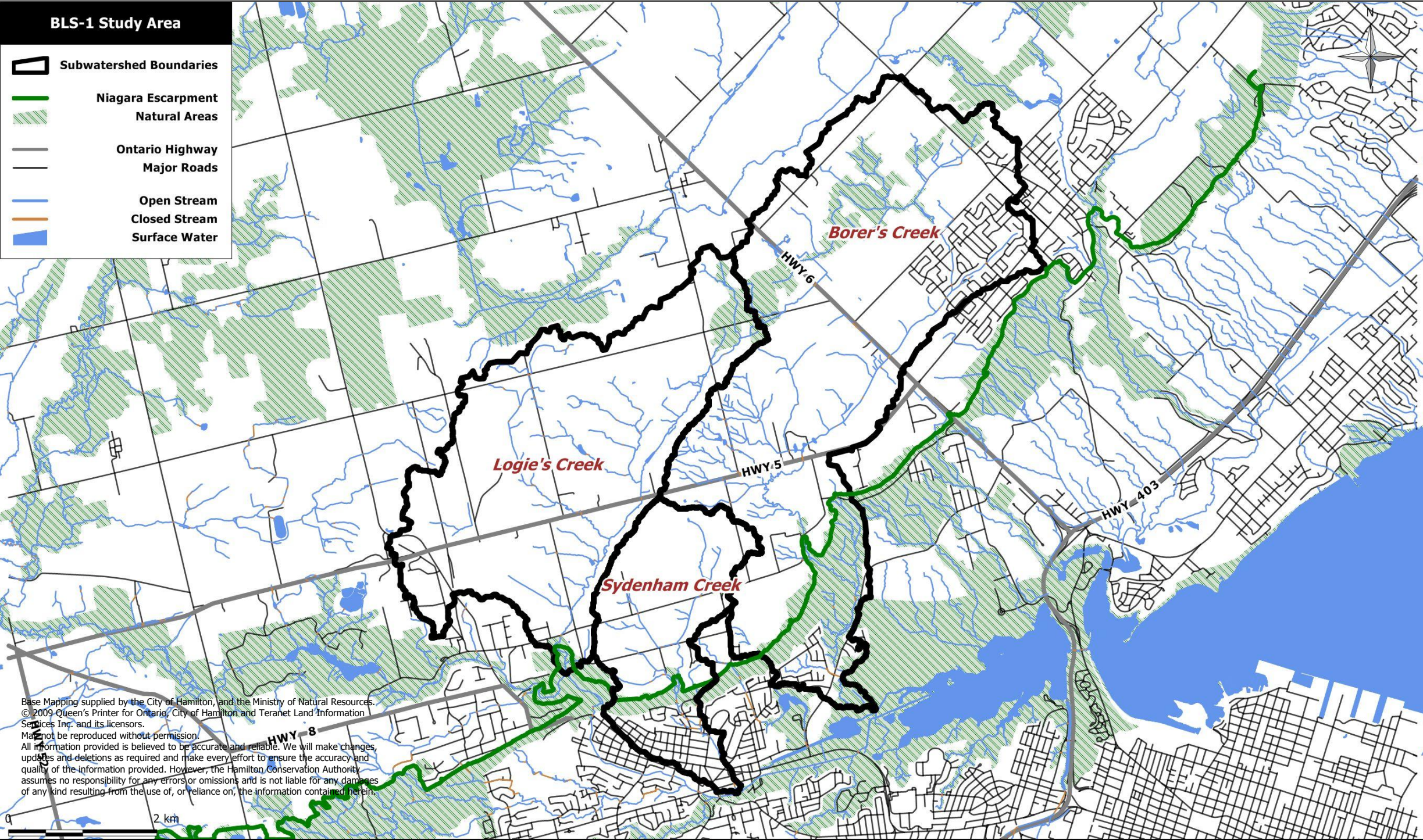
The purpose of the Spencer Creek Stewardship Action Plans are to create awareness by educating the public on the environmental issues within their local subwatershed, and to in turn, improve the ecological functions of the subwatershed through restoration initiatives. These plans provide a comprehensive 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.

population, employment and development needs throughout the City over the next 30 years.

Below the Niagara Escarpment and in the Waterdown area, the Borer’s and Sydenham Creeks subwatersheds are predominantly residential with supporting institutional, commercial and utility land uses present. Both of these subwatersheds are currently in various phases of development, as the headwaters of the Borer’s subwatershed is intended for Greenfield development and the urban areas of both subwatersheds are intended for intensification, as outlined in the City of Hamilton’s GRIDS project.

Major stresses noted within these plans that are observed to be impacting these three subwatersheds are: stormsewer outfalls, habitat fragmentation, on-line ponds, outdoor recreation related degradation, Insufficient riparian buffers, water takings, water contamination via transportation corridors and channelization.





PLAN LIMITATIONS

Although measures were taken to complete a thorough analysis of the subwatersheds of Borer’s, Logie’s and Sydenham 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 fisheries assessments within the Borer’s, Logie’s and Sydenham 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 no fisheries or benthic sampling stations on Sydenham Creek.
 - There are two sampling stations on Logie’s Creek and six on Borer’s Creek but none have been sampled regularly in the past so as to generate data suitable for trend analyses.

- There are five benthic sampling sites on Borer’s Creek and one on Logie’s Creek; neither has been sampled regularly in the past or with using a consistent sampling protocol. Therefore the data collected is not suitable for trend analyses.
- There are Source Water Protection water quality and flow (surface and ground) sampling stations on both Borer’s and Logie’s Creek; however there is only one on each creek and they have only recently begun to be sampled.
- Riparian buffer data (1999 last time collected)

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 Spencer Creek Stewardship Planner for inclusion in any addendums to this document.

IMPLEMENTATION STRATEGY

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 Stewardship Programs and activities in these areas. The documents also provide approximate time frames for the implementation of each Action and list partner agencies that may support the Stewardship Action Plans Implementation Team members in executing their Implementation Work Plans throughout the 5 year implementation period (2010-2014).

Specific locations of stresses identified through stakeholder input and GIS analysis 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 Borer’s, Logie’s and Sydenham Creeks Stakeholder Advisory Committee.

Within each Stewardship Action Plan, stresses that are believed to be 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 development activities 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 Borer’s, Logie’s and Sydenham 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 as well as approximate time frames for their expected completion 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
- Restoration Opportunity: on-the-ground restoration work

A Spencer Creek Stewardship Action Plans Implementation Team has been established to carry out the Stewardship Actions identified within the Stewardship Action Plans for all 15 subwatersheds of Spencer Creek; 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

IMPLEMENTATION STRATEGY

Plan, 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.

September

- 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. An approximate time frame for the completion of each Stewardship Action has been developed and all are noted within the Stewardship Actions Tables in each of the Stewardship Action Plans.

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

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

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. Borer's Creek Subwatershed Plan. Watershed Planning & Engineering Division. October 2000.

This document serves to expand upon the preliminary information with regard to the Borer's Creek Subwatershed that was included in the Spencer Creek Watershed Management Plan, produced by the HCA in 1997. This document included the assemblage of the existing information and expanded on that base data, including detailed descriptions of significant natural features, the identification of land/water linkages and processes, the identification of land use pressures within the subwatershed and highlighting opportunities for improved protection, enhancement, rehabilitation and sustainable development. The document elaborated further with assessments of management strategies for natural areas and corridors, open space, water quality and quantity, proposed development, stewardship activities and the establishment of monitoring requirements and an implementation framework.

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.

ANNOTATED BIBLIOGRAPHY

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.

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 Draft. Royal Botanical Gardens: October 2008.

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.

APPENDICIES *(Available at the Hamilton Conservation Authority Main Office)*

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

APPENDIX B - FISHERIES INVENTORY

APPENDIX C - SIGNIFICANT SPECIES

APPENDIX D - WATER QUALITY ASSESSMENT AT BORER’S AND LOGIE’S CREEKS

APPENDIX E - SURFACE WATER FLOW ASSESSMENT AT BORER’S AND LOGIE’S CREEK

APPENDIX F - DATA SOURCES

APPENDIX G - SPENCER CREEK MEDIA COVERAGE