

UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS STEWARDSHIP ACTION PLANS

Part of the Spencer Creek Stewardship Action Plan 2012



Endorsed by the HCA Board of Directors May 2012

STEWARDSHIP ACTION PLANS: Upper Spencer, Fletcher and Flamborough Creeks
Part of the Spencer Creek Stewardship Action Plan
May 2012

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

UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS STAKEHOLDERS ADVISORY COMMITTEE MEMBERS

<i>Name</i>	<i>Representation</i>	<i>Position (if applicable)</i>
Cherish Elwell	Hamilton-Halton Watershed Stewardship Program	Watershed Stewardship Technician
Darren Kenny	Hamilton Conservation Authority, Planning	Watershed Officer
David Ide	Citizen	
Lillian Ide	Citizen	
Lisa Jennings	Hamilton Conservation Authority, Ecology	Assistant Ecologist
Ellen Wall	Hamilton-Wentworth Stewardship Council (Ministry of Natural Resources)	Chair
Gordon Noble	City of Hamilton, Operations and Waste Management	Acting Superintendent-Parks West
John Pepper	Citizen	
Nina Goodrich	Citizen	
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Patrick Ragaz	Hamilton Conservation Authority, Engineering	Water Resources Engineer
Sheila O'Neal	Hamilton-Halton Watershed Stewardship Program	Program Manager



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 - xxvi

 SUMMARY.....i

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

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

 MAP OF STUDY AREA.....xxvi

FOREWARD.....xxvii

BACKGROUND.....xxviii - xxix

 BACKGROUND.....xxii

 MAP OF SPENCER CREEK WATERSHED.....xxx

 MAP OF UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS SUBWATERSHEDS.....xxxi

PLAN LIMITATIONS.....xxxii

IMPLEMENTATION STRATEGY.....xxxiii - xxxiv

BIBLIOGRAPHY.....xxxv

UPPER SPENCER CREEK STEWARDSHIP ACTION PLAN.....US 1 - 51

FLETCHER CREEK STEWARDSHIP ACTION PLAN.....FLE 1 - 57

FLAMBOROUGH CREEK STEWARDSHIP ACTION PLAN.....FLA 1 - 48

APPENDICIES – AVAILABLE FROM THE HCA MAIN OFFICE ON REQUEST

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

 APPENDIX B - FISHERIES INVENTORY

 APPENDIX C - SIGNIFICANT SPECIES

 APPENDIX D - WATER QUALITY ASSESSMENT UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS

 APPENDIX E - SURFACE WATER FLOW ASSESSMENT UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS

 APPENDIX F - DATA SOURCES

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.

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 fifth year of the initiative, local stakeholders have jointly developed comprehensive Action Plans for the Upper Spencer, Fletcher and Flamborough 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.

- 898 specific occurrences of stresses were identified at locations throughout the subwatersheds, 440 are in Upper Spencer Creek, 325 in Fletcher Creek and 133 in Flamborough 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 and wetland boundaries 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 was commonly ranked as the most prevalent stress. On-line ponds, dams and water takings are also commonly ranked as the most prevalent stresses in all three subwatersheds.
- 232 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 Upper Spencer, Fletcher and Flamborough Creeks Subwatersheds Summary Table on pages iv – xxix for detailed descriptions of each Stewardship Action.

Partners identified in the Upper Spencer, Fletcher and Flamborough 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 UPPER SPENCER CREEK SUBWATERSHED
440 STRESSES IDENTIFIED

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	359
Online Pond	OP	63
Dam (Weir)	DM	8
Water Taking	WT	5
Abandoned Groundwater Wells	GW	2
Fluctuating Water Level	WL	1
Migration Barrier	MB	1
Perched Culvert	CP	1
Buried Stream	BS	None Identified
Channelization	CH	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
Habitat Fragmentation	HF	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
Land Maintenance Practices	LM	None Identified
Landfill Leachate	LL	None Identified
Litter	LI	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
Utility Pipeline	UP	None Identified
Watercourse Enclosure	WE	None Identified
Wildlife Collision	WC	None Identified
Wildlife Overpopulation	WO	None Identified

TABLE 2 FLETCHER CREEK SUBWATERSHED
325 STRESSES IDENTIFIED

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	279
Online Pond	OP	38
Abandoned Groundwater Wells	GW	2
Perched Culvert	CP	2
Dam (Weir)	DM	1
Invasive/Introduced Species	IV	1
Land Maintenance Practices	LM	1
Litter	LI	1
Buried Stream	BS	None Identified
Channelization	CH	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
Habitat Fragmentation	HF	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
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
Utility Pipeline	UP	None Identified
Water Taking	WT	None Identified
Watercourse Enclosure	WE	None Identified
Wildlife Collision	WC	None Identified
Wildlife Overpopulation	WO	None Identified

EXECUTIVE SUMMARY – STRESS INVENTORY TABLES

TABLE 3 FLAMBOROUGH CREEK SUBWATERSHED
133 STRESSES IDENTIFIED

STRESS	MAP CODE	NO. IN SUBWATERSHED
Insufficient Riparian Buffer	RB	122
Water Taking	WT	7
Dam	DM	2
Abandoned Groundwater Wells	GW	1
Invasive/Introduced Species	IV	1
Buried Stream	BS	None Identified
Channelization	CH	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
Habitat Fragmentation	HF	None Identified
Illegal Fill Placement	FP	None Identified
Inadequate Stormwater Management	SW	None Identified
Increased Impervious Surface	IS	None Identified
Land Maintenance Practices	LM	None Identified
Landfill Leachate	LL	None Identified
Litter	LI	None Identified
Migration Barrier	MB	None Identified
Nutrient Loading	NL	None Identified
Online Pond	OP	None Identified
Outdoor Recreation Related Impacts	OR	None Identified
Perched Culvert	CP	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
Utility Pipeline	UP	None Identified
Watercourse Enclosure	WE	None Identified
Wildlife Collision	WC	None Identified
Wildlife Overpopulation	WO	None Identified

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
Abandoned Groundwater Wells Map Code: GW 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.	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 / GV / HCA
	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.				CITY E&SI / HHWSP	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 / GV / HCA
			Work with landowners to decommission abandoned groundwater wells.		HHWSP	CITY / GV / HCA
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: Recommendations EPI-6, FW-4, F-11, F-12, PAA-2 and ULM-2 HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55	HHWSP / HWSC	DFO / HCA / MTO / RAP / WPN
		Undertake a feasibility and prioritization study for “daylighting” buried streams in the study area.		Fisheries Act, Section 37	CITY E&SI	DFO / HCA / HHWSP / MNR / MTO / RAP
			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	CITY / DFO / HCA / HWSC

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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: Recommendations EPI-6, FW-4, F-11, F-12, PAA-2 and ULM-2 HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55 Fisheries Act, Section 37 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 142-158	HHWSP / HWSC	CITY / FSRT / HCA / RAP / RBG / WPN
		Undertake a feasibility and prioritization study for restoring channelized creeks to those with a natural design.			CITY E&SI	DFO / HCA / HHWSP / MNR / RAP
			Work with landowners downstream of channelized sites to rehabilitate the riparian zone to reduce flow velocities, erosion and sedimentation.		HHWSP	CITY / DFO / HCA / HWSC / RBG
			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	CITY / DFO / HCA / HWSC
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. (*Also includes weirs formerly map code WR)	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: Recommendations FW-4, F-11 and PAA-2 HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55 Fisheries Act, Section 37 Hamilton Conservation Authority Dam Inventory Project In-stream Barrier Assessment for the Hamilton Harbour AOC.	HHWSP	DFO / HCA / HWSC / MNR
	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.				HHWSP / HWSC	DFO / HCA / MNR
		Undertake a feasibility and prioritization study for the removal of dams inventoried.			HCA Eng. / MNR	HHWSP / HWSC
			Work with landowners to remove/retrofit dams as prioritized in the Barrier Mitigation Plan associated with the Hamilton Harbour Fisheries Management Plan.	Hamilton Harbour Fisheries Management Plan	HHWSP	CITY / DFO / HCA / HWSC / MNR
Debris Jams Map Code: DJ	Incorporate debris jam removal into the City of Hamilton Adopt a Park and Neighbourhood Clean Team.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-4, F-11 and PAA-2	CITY Op. & W. Man.	BARC / DFO / HCA / HHWSP / HWSC / MNR

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STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
Definition: The accumulation of debris within a watercourse that prevents the flow of water.	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.			Hamilton Harbour Fisheries Management Plan In-stream Barrier Assessment for the Hamilton Harbour AOC.	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.	CITY / MNR
			Work with landowners to remove debris jams using proper sediment and erosion control practices.		HHWSP	CITY / DFO / HCA / HWSC
		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.			HCA Eng.	HHWSP / MNR
Detachment from Nature Map Code: DT Definition: The condition of people disassociating their existence from nature.		Assess barriers to participation in environmental programs to improve program design.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI -1, EPI-2, EPI-3, EPI-5, EPI-6, PAA-1, PAA-2, PAA-3, ULM-7 and ULM-14 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	CITY / GV / HWSC
	Continue to implement the Watershed Steward Award Program.				HHWSP	BARC / HCA
	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.				BARC / CITY E&SI / CITY Op. & W. Man. (Outreach) / HCA Ecol. / HHWSP	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.				BARC / GV / HCA / HWSC / RBG	CITY
	Erect creek crossing & ecological corridor signage along roadways.				CITY Planning	BARC / GV / HCA / HWSC / WPN

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	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 / CITY E&SI / GV / HCA Lands / RBG	HHWSP / HWSC
	Support the formation and activities of "Friends of" groups aimed at protecting and rehabilitating natural features.				CITY Op. & W. Man. (Outreach) / HCA Lands / HHWSP / HWSC	BARC / BTC / DFO
	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 / DU / GV / HCA / WPN
		Assess landowner willingness to participate in and/or support water quality improvement and habitat restoration projects.			HHWSP	CITY / HCA / HWSC
		Encourage municipalities and trail managers to coordinate trail plans that improve access between urban centres and provide links to parks and rural areas.			CITY Planning / HCA Lands / RBG	HHWSP / HWSC
			Work with citizen groups to undertake restoration projects on public and private lands, including "Friends of" work days, Adopt a Creek, Fishing Clubs, etc.		BARC / CITY Op. & W. Man. / HCA Ecol. / HHWSP	BTC / HWSC / RBG
			Work with schools and School Boards to implement the School Grounds Naturally Program; undertaking school yard naturalization projects.		HHWSP	CITY / HCA / HWSC
Development Map Code: DV Definition: The process of			Work to undertake in-stream rehabilitation projects on sites identified in the Stewardship Action Plans as suitable for the DFO Habitat compensation Program.	Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-12, ULM-2, ULM-3, ULM-8, ULM-13 and ULM-14	HCA Ecol. / HCA Eng.	CITY / DFO / HHHBA / MNR

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developing populated settlements: including housing and supporting infrastructure.	Host annual training sessions for City staff & development industry 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.).			Credit Valley Conservation and Toronto and Region Conservation Authority Low Impact Development Stormwater Management Manual HCA Planning and Regulation Policies and Guidelines	HCA Plan.	BARC / CITY / DFO / GV / MTO
		Encourage 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 Planning / HCA Eng.	GV / HHHBA
		Encourage 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 Planning	HCA / HHHBA
		Implement stewardship and management recommendations resulting from the HCA development permit application review process.			HCA Plan.	CITY / HHWSP / HWSC
		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
		Revise conflicting municipal by-laws regarding development practices and guidelines to facilitate increased use of Low Impact Development technologies.			CITY Planning / HCA Plan.	DFO / GV / HHHBA
		Work with development industry to initiate a Water Management Task Force to assist in implementing stewardship actions and recommendations from the Stormwater Master Plan.			HCA Eng.	CITY / HHHBA / RAP

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		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.			CITY E&SI	HCA
Encroachment Map Code: EN Definition: The act of undertaking practices on another person's property, i.e. erecting structures, planting gardens, disposal of waste.	Engage citizen groups to monitor & report areas affected by encroachment that are in need of restoration or that have been restored, to ensure mitigation of encroachment on public lands remains effective & to encourage neighbour-to-neighbour mentoring.			HCA Planning and Regulation Policies and Guidelines Pages 36-41, 55, 60 City of Hamilton Draft Private Tree and Woodland Conservation By-law City of Hamilton By-law No. 03-117 Illegal Dumping	CITY Op. & W. Man. / HCA Lands / RBG	BARC / BTC / GV / HHWSP / HWSC
	Install property demarcation posts (with agency logos) at regular intervals along property boundaries to prevent encroachment into natural areas.				CITY Op. & W. Man. / HCA Lands / RBG	HHWSP
	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. & W. Man. / HCA Lands / HHWSP / RBG	BARC / BTC / GV / HWSC
	Work with local nurseries & landscaping co.'s to educate / encourage landowners to use native plants.				HHWSP	CITY / GV / HCA / HWSC / RBG
			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. & W. Man. / HCA Lands / HHWSP / RBG	BARC / GV / HNC / HWSC
	Conduct a direct mailing of an encroachment education brochure to landowners adjacent to Conservation Authority, RBG and City natural areas.				CITY Op. & W. Man. / HCA Lands / HHWSP / RBG	HWSC
Erosion Map Code: ER Definition: The process of soil being scoured or washed away by flowing water.	Conduct a direct mailing to landowners where erosion has been identified through the City of Hamilton GRIDS Plan.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW-4, ULM-2 and ULM-3	HHWSP	CITY / HCA / HWSC / OSCIA
	Create demonstration sites on public lands that highlight streambank stabilization and natural channel design projects.			HCA Planning and Regulation Policies and Guidelines	HHWSP	CITY / DFO / HCA / HWSC / OSCIA / RBG

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STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Host training sessions for City staff and development industry to create awareness regarding BMPs & importance of properly maintained erosion / sediment control measures & enforcement.			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 Practices Series – No-Till Making It Work	HCA Eng.	CITY / DFO / HWSC
	Utilize enforcement scheme to enforce appropriate erosion control measures on development sites, including: seeding, avoiding steep slopes, etc.				HCA Plan.	CITY / DFO / MNR
	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
		Expand the City of Hamilton Erosion Hot Spots identification project into rural areas			CITY E&SI	HCA
		Select erosion sites as identified in the City of Hamilton GRIDS Plan for the upcoming HCA Erosion and Sediment Control Pilot Project.			HCA Plan.	CITY / DFO / HHWSP / HWSC
			Work with City staff to install permeable conveyance systems (infiltration trenches) along roadsides as an alternative to the conventional ditch system.		CITY Op. & W. Man.	DFO / HCA / MTO
			Work with landowners to undertake bank stabilization and erosion rehabilitation projects using bioengineering design principles.		HHWSP	BARC / DFO / FSRT / HCA / HWSC / OSCIA
			Work with landowners to undertake erosion rehabilitation projects as identified in the City of Hamilton GRIDS Plan.		CITY E&SI	DFO / HCA / HHWSP / HWSC
		Complete field study of stream morphology, determining erosion hotspots & associated causes			HCA Eng.	CITY
Faulty Septic Systems Map Code: SS Definition: Malfunctioning septic systems; including plugged distribution tiles, infrequent tank		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.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation WQ-d1 City of Hamilton's Greensville Community Subwatershed Study	CITY E&SI / HCA Eng.	RAP

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pumping, etc. lead to untreated sewage contaminating our ground and surface water.	Create demonstration sites on public lands that highlight properly functioning septic systems.			Ontario New Home Warranty Program – A New Homeowner’s Guide to Septic Systems	CITY Bldg. Serv. / CITY Op. & W. Man. / HCA Lands	HHWSP / HWSC
	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	BARC / CITY / HCA
		Conduct an inventory to determine how many households in the Spencer Creek watershed are serviced by on-site treatment systems.			CITY Bldg. Serv.	RAP
		Develop a tax reduction incentive or grant program for upgrading faulty septic systems			CITY Planning	HHWSP / MOE
		Undertake a risk analysis of the potential for old and/or degraded sewer lines to contaminate groundwater.			CITY E&SI	MOE / RAP
			Work with landowners to properly maintain their septic systems or upgrade or decommission faulty or unused septic systems.		HHWSP	CITY / GV / HCA / HWSC
Fluctuating Water Levels Map Code: WL Definition: Irregular occurrences of high and low water levels in the creek system.	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage &/or direct landowner contact to explain the purpose, operation and maintenance of HCA flood control structures.				HCA Eng.	CITY / HHWSP / MNR
		Work to determine the cause of water level fluctuations and develop recommendations for altering practices to reduce or eliminate fluctuations.			HCA Eng.	CITY / DFO / HHWSP / MNR
			Work to implement alternative practices as per recommendations resulting from the inquiry into the cause of water level fluctuations in the system.		HCA Eng.	CITY / DFO / HHWSP / MNR
Habitat Fragmentation		Map fisheries information throughout each subwatershed to identify areas at risk and prioritize areas for remediation.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW-2, FW-4, FW-12, PAA-1 and ULM-2	HCA Ecol.	CITY / HCA / HHWSP / HWSC / MNR

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
			Manage public lands for wildlife habitat, including plantation plantings and rented agricultural lands.	HCA Planning and Regulation Policies and Guidelines Pages 53-59 City of Hamilton Draft Private Tree and Woodland Conservation By-law Cootes to Escarpment Park System – A Conservation and Land Management Strategy Nature Counts – City of Hamilton Natural Areas inventory City of Hamilton Natural Heritage Strategy City of Hamilton Natural Areas Acquisition Fund Strategy Dundas Valley 50 Year Vision Hamilton Harbour Fisheries Management Plan OMAFRA Best Management Practices Series – Farm Forestry and Habitat Management OMAFRA Best Management Practices Series – Fish and Wildlife Habitat Management	HCA Lands	CITY / HHWSP / MNR
			Implement the actions outlined in the Dundas Valley 50 Year Vision, Cootes to Escarpment and City of Hamilton Natural Heritage Strategies relating to preserving and enhancing natural heritage systems.		CITY / HCA Lands / RBG	BARC / HHWSP / HWSC
	Create demonstration sites on public lands that highlight various types of terrestrial and aquatic habitat restoration projects.				HHWSP	CITY / DFO / DU / HCA / HNC / HWSC / RBG
	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	CITY / HCA / HNC / HWSC
	Encourage urban reforestation practices in private properties and reduction of lawn areas.				CITY Op. & W. Man.	HCA / HHWSP / HNC / HWSC
	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 / HWSC	CITY / CCC / DU / HCA / HNC / MNR / RBG
	Utilize workshops, information sessions, literature, websites, public service announcements, interpretive signage & direct landowner contact to promote the importance of preserving wetland ecosystems.					
		Continue to complete ecological surveys (using the Ecological Land Classification system) to ensure species at risk habitat or rare ecological areas are not disrupted.			CITY Planning / HCA Ecol.	HHWSP / HWSC / MNR / RAP / RBG
		Develop How Much Habitat is Enough targets for each subwatershed.			HCA Ecol.	CITY / CCC / DFO / DU / HHWSP / HWSC / MNR / RBG
		Establish a Woodlot Owners Association for this area as recommended by Re-Leaf Hamilton			HWSC	HCA / HHWSP / HNC / MNR / RBG

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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		Protect and enhance natural corridors through parks and public lands by ensuring that naturalization and habitat creation are incorporated into master planning.			CITY Planning / HCA Lands / RBG	HHWSP / HNC / HWSC / MNR
		Work to acquire lands that enhance and further the continuity of the natural heritage system.			HHWSP / HNC	HCA / HHWSP / HNC / HWSC / RBG
		Work with the aggregate industry when planning new/expanded pit and quarry operations to minimize impacts on the adjacent natural features.			HCA Ecol.	CITY / MNR
			Work with landowners to undertake habitat creation and enhancement projects which enhance core habitat by infilling areas within or linking existing forested areas		HHWSP	DFO / DU / HCA / HWSC / OSCIA
			Work with the aggregate industry to restore decommissioned pits and quarries into natural habitat through the Management of Abandoned Aggregate Properties Program.		HCA Ecol.	CITY / MNR
Illegal Fill Placement Map Code: FP Definition: The act of 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 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.	CITY / HHWSP / HWSC
			Work with landowners to rehabilitate fill sites where identified		HCA Plan. / HHWSP	CITY / DFO
Inadequate Stormwater Management Map Code: SWM Definition: Inadequately managing stormwater to control water quality and flooding; often associated with the drainage of developed lands.	Implement the Stream of Dreams and Yellow Fish Road Programs with local schools, scout, girl guides and other children’s groups, to create awareness regarding stormwater input & the impacts of CSO outfalls on stream systems.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM - 6, ULM-9, ULM-11 and ULM-14 HCA Planning and Regulation Policies and Guidelines Pages 74-77	BARC	
	Support Sewer-Use Bylaw enforcement (By-law No. 04-150 as amended by By-Law No. 06-228).			Fisheries Act, Section 34	CITY E&SI	

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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		Conduct water quality testing at CSO outfalls pre and post mitigation to support mitigation measures		City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 38-44, 93-97, 122-125, 158-162	CITY E&SI	
	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 E&SI / GV	BARC / DFO / HCA / HHHBA / HHWSP / RAP
	Promote the use of constructed wetland technology and Low Impact Development in the design of stormwater management facilities.				CITY E&SI / HCA Eng.	HHHBA
	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 E&SI / GV	BARC / DFO / HCA / HHHBA / HHWSP / RAP
		Implement recommendations from the City of Hamilton Stormwater Master Plan.			CITY E&SI	BARC / GV / HCA / RAP
		Offer financial incentives to replace driveways and decks with permeable pavement, interlocking brick, etc.			CITY Planning	HCA
		Undertake a study to determine the percentage of landowners with connected downspouts.			CITY E&SI	BARC / GV / RAP
		Work with development industry 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.	BARC / DFO / HHHBA / HHWSP / RAP

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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			Retrofit existing dry stormwater management ponds to wet ponds where beneficial to water quality, aquatic habitat and erosion control.		CITY E&SI	HCA / RAP
			Retrofit outlet structures to decrease the velocity of stormwater as it flows into the creek system.		CITY E&SI	HCA / HHWSP / HWSC / RAP
			Work with landowners to disconnect downspouts and install rain barrels.		CITY E&SI	BARC / GV / HHWSP
Increased Impervious Surfacing Map Code: IS Definition: The decreased potential for rainwater infiltration into the soil as a result of increased paved/impermeable surfacing.	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 EPI-6, FW-4 and ULM-2 HCA Planning and Regulation Policies and Guidelines Pages 40, 55, 60 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 145-150,162-163 City of Hamilton Natural Heritage Strategy	HCA Plan.	CITY / GV / HHHBA / HHWSP / HWSC
	Host training sessions for HCA and City staff, development industry 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 Planning / HCA Plan.	HHHBA
	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.			Dundas Valley 50 Year Vision Cootes to Escarpment Park System – A Conservation and Land Management Strategy	GV	CITY / HCA / HHHBA / HHWSP
		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 Planning	HCA / RAP
		Measure impervious surfacing of commercial and industrial lands.			CITY Planning	HCA / RAP
			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 Eng.	CITY / GV / HHHBA

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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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: Recommendations EPI-6, FW-4 and ULM-2	HHWSP / HWSC	CITY / HCA / 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 Pages 40, 55, 60	HHWSP	CITY / HCA / HWSC
	Host workshops promoting the environmental and economic benefits of riparian buffers. i.e., preventing soil loss, preventing drifting snow, habitat creation, etc.			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 145-150,162-163	HHWSP	CITY / HCA / HWSC / OSCIA
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.			City of Hamilton Natural Heritage Strategy	HHWSP	CITY / HCA / HWSC / 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.			Dundas Valley 50 Year Vision	HHWSP	CITY / HCA / HWSC / 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	CITY / HCA / HWSC / OSCIA
Invasive/Introduced Species Map Code: IV Definition: The establishment/proliferation of exotic species that have no natural control measures which compete with native species for resources and degrade the ecosystem.		Comment on the re-drafting of the City of Hamilton Litter, Yard Waste and Property Maintenance by-law No. 03-118 to include language regarding the prevention of the introduction of non native and invasive species.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation FW-5	CITY Op. & W. Man.	GV / HCA / HHWSP / HWSC / RBG
	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 Invasive Alien Plant Species Found in the	HCA Ecol.	CITY / HHWSP / HNC / HWSC

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	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.			Carolinian Zone – Inventory and Management Options for rare Charitable Research Reserve Mistaken Identity – Invasive Plants and their native look-alikes.	HHWSP	CITY / HCA / HWSC
	Work with nurseries to develop a promotional program highlighting native species alternatives for commonly used non-native ornamental species.			City of Hamilton Natural Heritage Strategy Dundas Valley 50 Year Vision	HHWSP	CITY / GV / HCA / HWSC / RBG
		Develop an Invasive Species Management Program which includes monitoring sites and management for specific species.		Cootes to Escarpment Park System – A Conservation and Land Management Strategy	HCA Ecol.	CCC / CITY / HHWSP / HNC / HWSC / MNR / RBG
		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.			HCA Ecol.	BARC / CITY / HHWSP / HWSC / RBG
			Work with landowners to control invasive species and to plant native species.		HHWSP	CITY / GV / HCA / HWSC
Land Maintenance Practices Map Code: LM Definition: Errant or excessive land maintenance practice which unnecessarily degrade wildlife habitat.		Implement the Hydro One Integrated Land Management protocol on utility corridors that pass through HCA lands and continue to work with utility companies to develop low impact land maintenance practices to be implemented throughout utility corridors.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW-2, FW-4 and TSSR-6	HCA Plan.	CITY / HHWSP / HWSC / RBG
		Incorporate the installation of alternative roadside vegetation, such as MTO roadside prairie and wildlife shrub corridors, into existing maintenance plans.			CITY Op. & W. Man.	HCA
		Work with the City to develop guidelines for using native plant species for revegetation projects along roadsides.			CITY Op. & W. Man.	HCA
			Work to naturalize infrequently used areas of municipal parks (Adopt a Park) and Conservation Areas.		CITY Op. & W. Man. / HCA Lands	HHWSP / HNC / HWSC
			Work with the City to ensure roadside maintenance is not done in excess of access standards.		CITY Op. & W. Man.	GV / HCA / HHWSP / HNC / HWSC

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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Landfill Leachate Map Code: LL Definition: rainwater filtering down through the landfill materials with the potential to contaminate groundwater aquifers.		Monitor existing groundwater sampling programs to ensure that groundwater contamination is not occurring as a result of landfill leachate.		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendation ULM-12 HCA Planning and Regulation Policies and Guidelines Page 60	HCA Eng.	CITY / MOE / RAP
Litter Map Code: LI Definition: The act of illegally disposing of waste into public/natural areas.	Implement the 'Pack it in – Pack it out" waste disposal policy at strategic city parks, Conservation Areas and RBG lands.			City of Hamilton By-law No. 03-118 Litter, Yard Waste and Property Maintenance	CITY Op. & W. Man. / HCA Lands / RBG	HHWSP
	Promote the City of Hamilton's Team Up to Clean Up, Adopt a Park, and Neighbourhood Clean Team programs to assist community minded residents to undertake litter clean up projects.				CITY Op. & W. Man. (Outreach)	BARC / GV / HCA / HHWSP / HWSC / RBG
	Utilize literature, websites, public service announcements, & direct landowner contact to create awareness regarding the prevention and clean-up of litter.				CITY Op. & W. Man. / HCA Lands / RBG	BARC / GV / HHWSP / HWSC
	Work to develop an Adopt a Park / Friends of Program for Conservation Authority lands.				HCA Lands	CITY / HHWSP / HWSC
	Work to replace all current recycle bins in public areas with ones that have lids.				CITY Op. & W. Man. / HCA Lands / RBG	GV
		Undertake an inventory of illegal dumping sites throughout the subwatershed. Prioritize sites for the installation of deterrent mechanisms and the implementation of the Clean City Strategy Components.			CITY Op. & W. Man. / HCA Lands	RBG
			Work with local residents to host litter clean up events, such as the Great Canadian Shoreline Clean Up, on public lands; including City parks, Conservation Areas and RBG lands.		CITY Op. & W. Man. / HCA Lands / RBG	BARC / GV / HHWSP / HWSC
Migration Barrier Map Code: MB Definition: Any infrastructure that precludes the passage of wildlife into upstream habitat or the upper	Erect wildlife crossing signage where known migration corridors cross roadways and trails.			In-stream Barrier Assessment for the Hamilton Harbour AOC. Hamilton Harbour Fisheries Management Plan	CITY Planning / HCA Ecol. / RBG	BARC / HHWSP / HNC / HWSC / RAP / WPN

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
reaches of natural corridors.			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.		CITY Planning / HCA Ecol. / RBG	BARC / HHWSP / HNC / HWSC / RAP / WPN
Nutrient Loading Map Code: NL Definition: Excessive nutrients being inputted into a watercourse; often resulting from the application of manure/fertilizer. (* Also includes Phosphorous Loading formerly map code PL)	Create demonstration sites on public lands that highlight nutrient management BMP projects.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW-9, RM-4, RM-7, WQ-1d and ULM-2	HHWSP	HCA / HWSC / OSICA / RAP
	Host a training workshop for local golf course practitioners to discuss BMP's for golf course management, including Audubon Cooperative Sanctuary Program certification standards.			Nutrient Management Act 2002, O. Reg 267/03	HHWSP	HCA / HWSC / RAP / RCGA
	Promote software associated with the Nutrient Management Plan, to agricultural operators to ensure precise fertility programs.			Fisheries Act, Section 34	HHWSP	HWSC / OMAFRA / OSCIA
	Promote the City of Hamilton Only Rain Down the Drain awareness campaign.			HCA Planning and Regulation Policies and Guidelines Page 72	CITY E&SI	BARC / GV / HHWSP / 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.			Ministry of the Environment Water Management Policies and Guidelines – Provincial Water Quality Objectives Appendix A	HCA Eng. / HHWSP	BARC / GV / MOE / OMAFRA / OSCIA / RAP / RBG
		Develop a fertilizer use by-law under the Fertilizer Act, limiting the use of fertilizer for non essential purposes.		OMAFRA Best Management Practices Series – Nutrient Management Planning		
		Develop a plan to reduce nutrient levels to meet Provincial Water Quality Objectives as determined by the land use dependent nutrient level monitoring program.		OMAFRA Best Management Practices Series – Manure Management	CITY Planning	BARC / HCA / HHWSP / RAP / 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 Eng.	BARC / CITY / HHWSP / OMAFRA / OSCIA / RAP / RBG

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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		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.			HCA Ecol. / HCA Eng.	MOE / OMAFRA / OSICA / RAP
		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 Ecol. / HCA Eng.	CITY / MOE / RAP
		Encourage the provincial government to develop a policy to ban the use of phosphorous in fertilizer for cosmetic use.			GV	CITY / HCA / MOE
		Establish a nutrient level monitoring program with strategic sampling sites that are land use dependent, to identify specific sources of nutrient loading.			HCA Eng.	BARC / CITY / HHWSP / OMAFRA / OSCIA / RAP / RBG
		Model phosphorus loading in the subwatersheds and compare against RAP objectives			HCA Eng.	
			Work with landowners to reduce nutrient loading by implementing agricultural and urban BMP's related to nutrient management.		HHWSP	CITY / HCA / HWSC / OMAFRA / OSCIA
On-line Ponds Map Code: OP 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.	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 EPI-6, FW-1, FW-4 and ULM-2 Fisheries Act, Section 37	HHWSP / HWSC	CITY / DFO / HCA / OSCIA / OMAFRA
			Work with landowners to restore or retrofit on-line ponds.	HCA Planning and Regulation Policies and Guidelines Page 63 In-stream Barrier Assessment for the Hamilton Harbour AOC	HCA Eng. / HCA Plan. / HHWSP	CITY / DFO / HCA / HWSC / OMAFRA / OSCIA
Outdoor Recreation Related Impacts Map Code: OR Definition: Recreational activities occurring in natural areas that	Add “tread lightly” messaging to partner recreation oriented websites.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations FW-8, PAA-1, PAA-2 and PAA-3 The Conservation Lands of Ontario –	CITY Op. & W. Man. / HCA Lands / RBG	BTC / NHC
	Erect signage explaining the environmental significance of natural areas and promoting user “etiquette” for the area.				CITY Op. & W. Man. / HCA Lands / RBG	BTC / HHWSP / HNC

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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inadvertently degrade the natural features of the area.	Install deterrent mechanisms along trails and in off trail areas known to be degraded by trespassing; such as no trespassing signage.			Three Year Business Plan	CITY Op. & W. Man. / HCA Lands / RBG	BTC / HNC
	Promote the City of Hamilton Adopt-a-Park and Neighbourhood Clean Team Programs.			A Joint Outdoor Tourism Marketing Strategy	CITY Op. & W. Man.	BTC / HCA / HHWSP / HNC / RBG
	Support the formation and activities of “Friends of” groups aimed at protecting and rehabilitating natural features.			Niagara Escarpment Access Enhancement Plan	CITY Op. & W. Man.	BARC / BTC / HWSC
		Consider designating days/areas for ATV and snowmobile use as a deterrent to use in prohibited areas.		Dundas Valley 50 Year Vision Strategy	CITY Op. & W. Man. / HCA Lands / HHWSP / RBG	HHWSP / HNC
		Continue to monitor Category A and B waterfalls on public lands for signs of overuse.		Cootes to Escarpment Conservation & Land Management Strategy	CITY Op. & W. Man. / HCA Lands / RBG	BTC
		Develop marketing strategies for sensitive lands that focus on sustainable use.			CITY Op. & W. Man. / HCA Lands / RBG	BTC / HNC
		Refer to the Niagara Escarpment Access Enhancement Plan to design infrastructure for high traffic areas to guide users along approved trails.			CITY Op. & W. Man. / HCA Lands / RBG	BTC
		When undertaking master planning exercises, refer to the Ontario Trails Guidelines and Best Practices for the Design, Construction and Maintenance of Sustainable Trails.			CITY E&SI (L.A.S.) / HCA Lands / RBG	
			Host annual clean up days for natural areas identified as having excessive amounts of litter.		CITY Op. & W. Man. / HCA Lands / RBG	BARC / BTC / HHWSP / HNC / HWSC
			Rotationally restrict access to degraded areas to allow for the regeneration of vegetation.		CITY Op. & W. Man. / HCA Lands / RBG	BTC / HNC
			When conducting maintenance of existing trails, refer to the Ontario Trails Guidelines and Best Practices for the Design, Construction and Maintenance of Sustainable Trails.		CITY Op. & W. Man. / HCA Lands / RBG	BTC / HHWSP / HNC
Perched Culverts Map Code: CP	Host training sessions for HCA and City staff to promote the proper design and installation of culverts.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW-1 and FW-4	CITY Op. & W. Man. / HCA Eng.	DFO / HHWSP / MNR

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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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.			Fisheries Act, Section 37 HCA Planning and Regulation Policies and Guidelines Page 41	HHWSP / HWSC	CITY / DFO / HCA / MNR
		Undertake an inventory of perched and closed bottom culverts throughout the subwatershed. Prioritize culverts for mitigation or replacement.		In-stream Barrier Assessment for the Hamilton Harbour AOC	CITY Op. & W. Man.	DFO / HCA / HHWSP / 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.		HCA Eng. / HCA Plan. / HHWSP	CITY / DFO / HCA / OMAFRA / OSCIA
Pesticide Use Map Code: PS 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.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-4, EPI-6, TSSR-6 and ULM-2	HHWSP	CITY / GV / HWSC / OMAFRA / OSCIA
	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.			Fisheries Act, Section 34 City of Hamilton By -Law No. 07-282 Pesticides Act Ontario Regulation 63/09	HHWSP	CITY / HWSC / RCGA
	Promote Municipal and Provincial Pesticide By-Laws.			OMAFRA Best Management Practices Series – integrated Pest Management	CITY Op. & W. Man. / GV	HHWSP / HWSC / OMAFRA / OSCIA
	Promote Integrated Pest Management principles, Natural Tips for Healthy Lawns and Gardens and alternative turf management techniques.			OMAFRA Best Management Practices Series – Pesticide Storage, Handling and Application	CITY Op. & W. Man.	GV / HHWSP / HWSC / OMAFRA / OSCIA
	Promote the Ministry of the Environment 'Add It Up Program – Going Pesticide Free' Program				GV	CITY / HHWSP / HWSC
	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	CITY / HCA / HHWSP / OMAFRA / OSCIA

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
		Undertake a study to determine the current level of pesticide/herbicide use in the subwatershed and develop targets for reduction.			CITY Op. & W. Man.	GV / HHWSP / HWSC / OMAFRA / OSCIA
			Work with landowners to implement alternatives to pesticide use.		GV / HHWSP	CITY / HWSC / OMAFRA / OSCIA
Plowed Watercourse Map Code: PW Definition: Headwater swales or small watercourses that are worked for agricultural production.	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 EPI-6, ULM-2, ULM-3 and ULM-4 Fisheries Act, Section 37 City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 44, 145-150 OMAFRA Best Management Practices Series – Soil Management	HHWSP	DFO / HCA / HWSC / OSCIA
	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.				HHWSP	DFO / HCA / HWSC / OMAFRA / OSCIA
	Promote the Environmental Farm Plan Program and associated Cost Sharing Programs for the implementation of BMP projects.				HHWSP	DFO / HCA / HWSC / OMAFRA / OSCIA
	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.				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 / RAP / RBG
Runoff Contamination via Transportation Corridors Map Code: TC 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.	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 Fisheries Act, Section 34 City of Hamilton 2003 Road Salt Management Plan Municipalities of Wellington County – 2005 Salt Management Plan	CITY Op. & W. Man. (Roads)	MTO
	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. & W. Man. (Roads) / HCA Eng.	DFO / MTO

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
	Utilize literature, websites, public service announcements & direct landowner contact to promote the use of sidewalk salt alternatives.				CITY Op. & W. Man. / 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.			CITY Op. & W. Man.	MTO
		Support planning for alternative and sustainable transportation strategies including Rapid Transit.			CITY Planning	HCA / HHHBA / MTO / RAP
		Undertake a study to determine the most effective method of snow removal that will reduce contamination of watercourses.			CITY Op. & W. Man.	DFO / HCA / MTO
			Implement improved snow removal methods as recommended by the study to determine effective methods of snow removal which also reduce contamination of watercourses.		CITY Op. & W. Man.	MTO
			Install vegetated filter strips and riparian buffers along medians and roadsides.		CITY Op. & W. Man.	HCA / MTO
Sediment Loading Map Code: SL Definition: Organic and inorganic material that is entrained by the flow of water and is deposited in a creek system.		Develop a total suspended solids target based on the PWQO turbidity recommendation of between 5-50 FTU (Formazin Turbidity Units)		Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, FW9, RM-4, ULM-2, ULM-3, ULM-5 and WQ-1d	HCA Eng.	DFO / HHWSP / HWSC / MNR / OSCIA / OMAFRA / RAP
	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.			Fisheries Act, Sections 34 and 36 Erosion and Sediment Control Guidelines for Urban Construction	HCA Eng. / HHWSP	DFO / HWSC / MNR / OMAFRA / OSCIA / RAP
			Monitor and enforce the proper installation and maintenance of sediment and erosion control measure on construction sites.	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 / DFO / HHHBA
			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)	OMAFRA Best Management Practices Series – No-Till Making it Work	HCA Eng.	DFO / HHWSP / HWSC / MNR / OMAFRA / OSCIA / RAP
			Work to mitigate non point sediment sources identified in the Watershed Planning Network Priority Remediation Report.	Ministry of the Environment Stormwater Management Design Guidelines	HCA Eng.	CITY / DFO / HHWSP / HWSC / MNR

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
			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 / DFO / HHHBA
			Work with landowners to reduce sediment loading by implementing BMP projects; e.g. streambank stabilization, riparian buffers, natural channel design.		HHWSP	DFO / HCA / HWSC / MNR / OMAFRA / OSCIA
Site Clearing Prior to Development Map Code: SC Definition: The act of stripping or excavating the vegetation and topsoil from a site prior to construction works.	Host training sessions for City staff, development industry and consultants to promote City standards and guidelines related to site preparation prior to development.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations ULM-3, ULM-4	CITY Planning / 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			HCA Planning and Regulation Policies and Guidelines Pages 50-62, 68-69	CITY Planning	DFO / HHHBA / HHWSP / HWSC / MNR / RAP
		Develop a municipal by-law to serve as a guideline for the management of tree species.		City of Hamilton Draft Private Tree and Woodland Conservation By-Law	City Planning	HCA / HWSC / MNR
			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 / DFO / HHHBA
Storm Sewer 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 RM-4, RM-7 ULM -6, ULM-9 and ULM-11 Fisheries Act, Section 34	BARC	CITY / GV / HCA / HHWSP / HWSC / RBG
	Promote the City of Hamilton Public Works Stormwater Pollution Solutions for Urban and Rural Residents Outreach Program			City of Hamilton Stormwater Master Plan Class Environmental Assessment Report Pages 43, 138, 158-159	CITY E&SI	GV / HCA / HHWSP / HWSC / RBG
	Promote the Municipal Sewer-Use By-law No. 04-150 as amended by By-Law No. 06-228.				CITY E&SI	GV / HCA / HHWSP / HWSC / RBG

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
		Reduce stormwater load to meet the MOE volumetric target of a 90% overflow capture rate for combined sewer systems			CITY E&SI	BARC / GV / HCA / RAP
		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 E&SI / HCA Eng.	BARC / MOE / RAP
		Work toward achieving the final net loading targets for CSO's outlined in the RAP.			CITY E&SI	BARC / GV / HCA / RAP
		Work with Green Venture to develop a Stormwater Mitigation Program.			GV	BARC / CITY / HCA / RAP
			Work to implement the recommendations in the sewershed water quality study.		CITY E&SI / HCA Eng.	BARC / DFO / HHWSP / HWSC / RAP
			Work with City Staff to retrofit outfalls to incorporate erosion control measures such as plunge pools, rip rap, tree planting etc.		CITY E&SI	BARC / DFO / HCA / HHWSP / HWSC / RAP
			Work with landowners to disconnect downspouts and to install rain barrels.		CITY E&SI / GV	BARC / HHWSP
			Work with landowners to establish riparian buffers and/or erosion protection downstream of storm sewer outfalls; e.g. river stone.		HHWSP	BARC / CITY / DFO / HCA / HWSC / RAP
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, development industry 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 E&SI	HCA / HHHBA / MTO
		When planning for major road works, design transportation corridors using new technologies for environmental solutions.			CITY E&SI	HCA / HHHBA / MTO
			When repairing roads, utilize new technologies for road maintenance that are proven to have environmental benefits.		CITY Op. & W. Man.	HCA / HHHBA / MTO

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
Utility Pipeline		Review individual utility company emergency protocols for identification of issues, reporting protocols and emergency contacts.			HCA Eng.	CITY / MOE
Water Takings Map Code: WT Definition: The process by which surface and groundwater are pumped out of the natural system; for the purposes of irrigation, aggregate extraction, etc.	Encourage landowners with surface water takings to install groundwater systems.			Hamilton Harbour Remedial Action Plan Stage 2 Update: Recommendations EPI-6, ULM-2 and ULM-12 Ontario Water Resources Act O. Reg. 387/04 OMAFRA Best Management Practices Series – Irrigation Management	HHWSP	HCA / HWSC / MOE / OMAFRA / OSCIA
	Encourage landowners with water taking needs to establish an Irrigation Advisory Committee to schedule takings alternately.				HHWSP	HCA / HWSC / MOE / OMAFRA / OSCIA
	Host open houses when experiencing Level 1 low water conditions to address landowner concerns and promote recommended reductions in rates and volumes of takings.				HCA Eng. / HHWSP	HCA / HWSC / MOE / OMAFRA / OSCIA
	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 / HWSC / MOE / OMAFRA / OSCIA
		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.			HCA Eng.	MNR / MOE
		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 Eng.	MOE
			Work with landowners to implement BMP's related to water conservation.		HHWSP	HCA / HWSC / MOE / OMAFRA / OSCIA

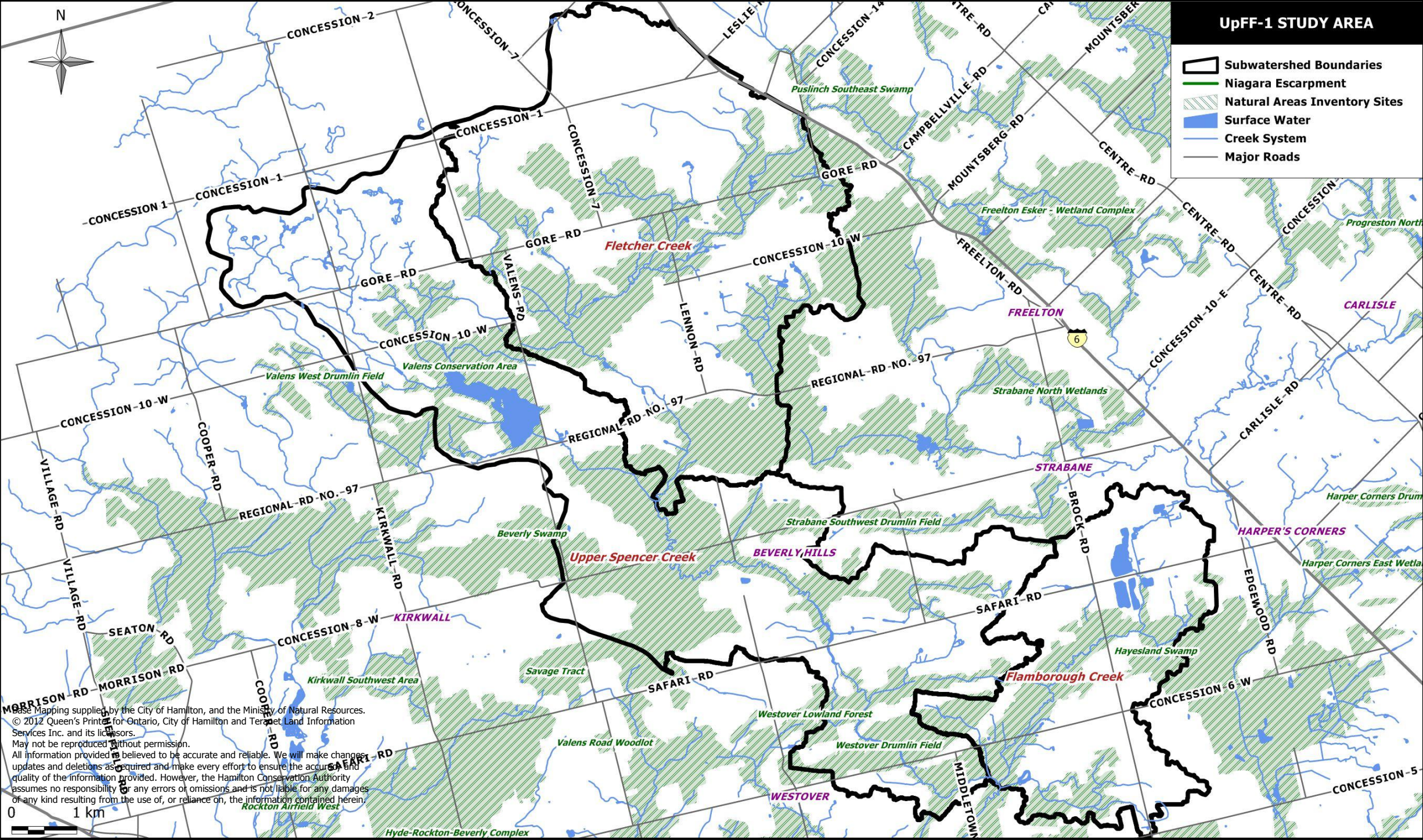
EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

STRESSES	STEWARDSHIP ACTIONS AO	STEWARDSHIP ACTIONS SSO	STEWARDSHIP ACTIONS RO	RELATED DOCUMENTS	LEAD AGENCY	PARTNER AGENCIES
			Work with landowners who have groundwater taking systems to decommission unused wells in accordance with the Ontario Water Resources Act.		HHWSP	CITY / HCA / OSCIA
Wildlife Collisions Map Code: WC Definition: Incidences where animals are struck by vehicles or where animals collide with buildings, often occurring with buildings with large windows.	Erect additional wildlife caution signage that is species specific, along roadways at known points of frequent collisions.			British Columbia Wildlife Collision Prevention Program Report City of Ottawa Wildlife/Vehicle Collision Prevention Program	CITY Op. & W. Man. (Roads)	HCA / MNR / MTO / RBG
	Utilize literature, websites, public service announcements, interpretive signage & direct landowner contact to create awareness regarding managing human-wildlife conflicts.				CITY Op. & W. Man. (Roads) / HCA Ecol.	HHWSP / HWSC / MNR / MTO / RBG
		Evaluate the effectiveness of the MTO roadside prairie and wildlife shrub corridor projects in preventing wildlife collisions.			CITY Op. & W. Man.	HCA / MNR / MTO
		When planning major road works, consider the incorporation of wildlife over/underpasses, avoiding known migratory corridors and other wildlife accommodations in the design.			CITY E&SI	HCA / MNR / MTO / RBG
			Conduct temporary road closures at known wildlife crossings and nesting sites during peak migration and nesting times.		CITY Op. & W. Man. (Roads)	HCA / MNR / MTO / RBG
			Erect fencing and alternative nesting mounds at known sites for turtle nesting.		CITY Op. & W. Man. (Roads)	HCA / MNR / MTO / RBG
			Produce and distribute window decals for large windows of homes and high rise buildings to prevent bird collisions.		CITY Bldg. Serv. / HCA Ecol.	HHWSP / HWSC / RBG
			Reduce the use of road salt or consider alternatives that do not attract wildlife.		CITY Op. & W. Man. (Roads)	HCA / MNR / MTO
Wildlife Overpopulation Map Code: WO Definition: When a species population exceeds the carrying capacity of its habitat.	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	CITY Op. & W. Man. / HCA Ecol.	HHWSP / MNR
			Work to implement the recommendations for sustainable populations in the HCA/MNR Deer Management Strategy.		CITY Planning / HCA Ecol.	HHWSP / MNR

PARTNER AGENCY ACRONYMS

EXECUTIVE SUMMARY – STEWARDSHIP ACTIONS SUMMARY TABLE

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

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 2008).

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, 2008) 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.

Although scheduled to be completed in the final year of the Spencer Creek Stewardship Action Plans project, Stewardship activities in the Upper Spencer, Fletcher and Flamborough Creeks continued throughout the duration of the project as the preservation of the natural features in these subwatersheds has always been a priority for the HCA and its partners as they are of great hydrological and ecological importance.

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

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.

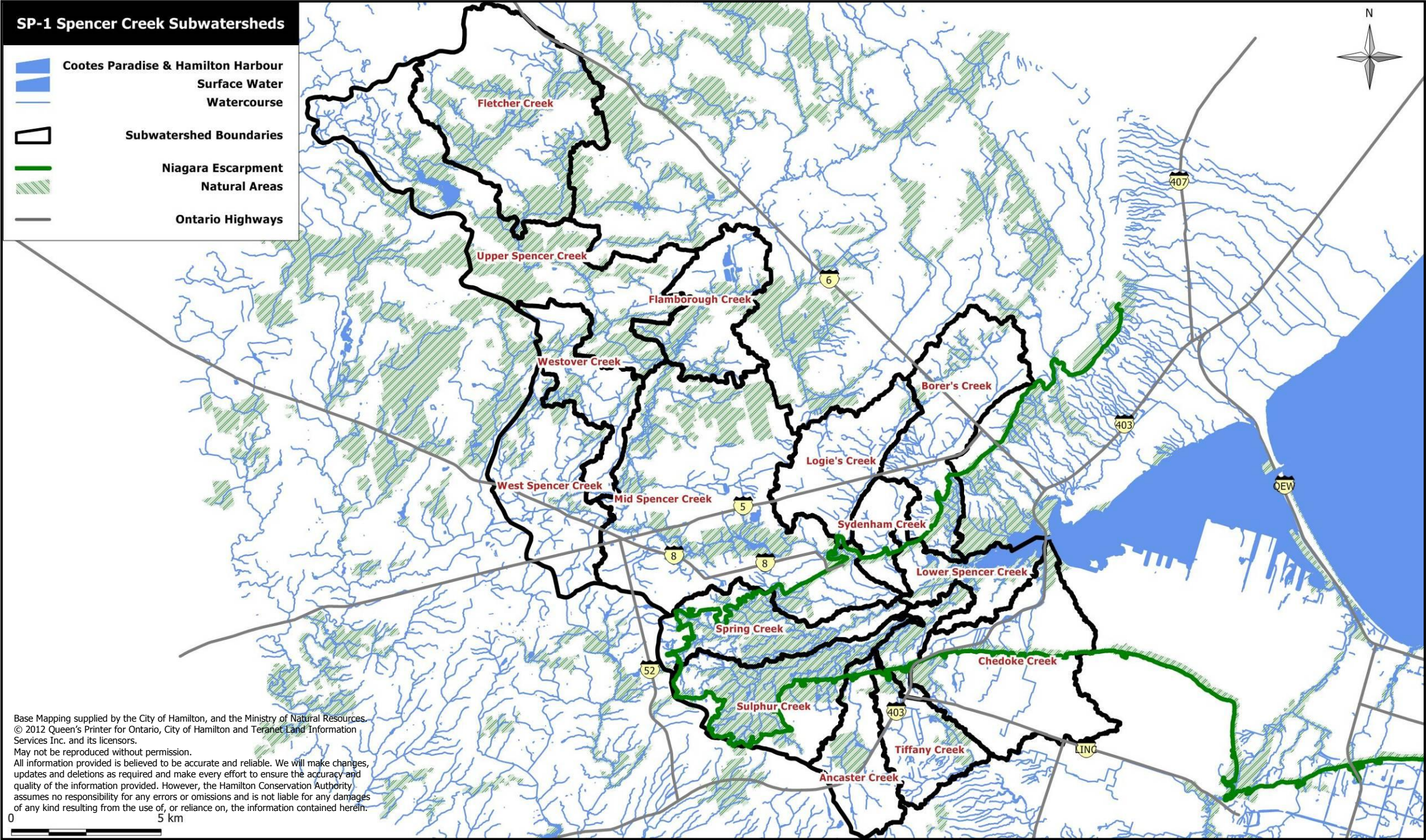
UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS SUBWATERSHEDS

The Upper Spencer, Fletcher and Flamborough Creeks subwatersheds are approximately 79km², or 28% of the Spencer Creek watershed’s 279 km² area. The waters of Upper Spencer, Fletcher and Flamborough Creeks drain into Middle Spencer Creek subwatershed, where Middle Spencer Creek then flows into Lower Spencer Creek and ultimately the Cootes Paradise Basin. Cootes Paradise is a provincially significant coastal wetland located at the western end of Hamilton Harbour.

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 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.

These subwatersheds lie on the table lands of the Niagara Escarpment. They are unique in that they are able to support a variety of different land uses, including: agriculture, residential housing and recreation while at the same time including some of Hamilton’s most significant natural areas. The subwatersheds are predominately agricultural and natural areas with the exception of small settlement areas.

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.



PLAN LIMITATIONS

Although measures were taken to complete a thorough analysis of the subwatersheds of Upper Spencer, Fletcher and Flamborough 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 Upper Spencer, Fletcher and Flamborough 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 is one annual fisheries and benthic monitoring station in the Upper Spencer Creek subwatershed and there are nine additional monitoring stations throughout all three subwaterheds 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 two Source Water Protection surface water quality and flow sampling stations, one in the Upper Spencer Creek subwatershed and the other in Fletcher Creek; 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 Fletcher and Flamborough Creek subwatersheds.
 - There are no Provincial Water Quality Monitoring sampling stations in the Fletcher and Flamborough Creek subwatersheds.
 - There is no Provincial Groundwater Quality Monitoring sampling station in Flamborough Creek subwatershed.
- 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.

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 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 Upper Spencer, Fletcher and Flamborough Creeks Stakeholder Advisory Committee.

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 Upper Spencer, Fletcher and Flamborough 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,

IMPLEMENTATION STRATEGY

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

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APPENDICIES

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 UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS

APPENDIX E - SURFACE WATER FLOW ASSESSMENT UPPER SPENCER, FLETCHER AND FLAMBOROUGH CREEKS

APPENDIX F - DATA SOURCES

