



Carp Action Plan



May 2015

Potential Rehabilitation Along the Carp River Downstream of Richardson Side Road

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1.0 Background

The Carp Action Plan was initiated by Mississippi Valley Conservation Authority (MVCA) and the Friends of the Carp River (FCR) in 2012 with funding from Shell Canada, a Department of Fisheries and Oceans grant, and private donations from landowners in the Carp area. The Action Plan was developed to support the findings of the Carp River Subwatershed Study, which was completed by the City of Ottawa in 2004. The purpose of this report will be to review the original and still valid objectives of the Carp River Subwatershed Study, provide an update of the current status of the Carp Action Plan, and to identify specific initiatives for the Carp Action Plan.

2.0 Review of Carp River Subwatershed Study Objectives

The purpose of the Carp River Subwatershed Study (CRSWS) was to acquire an understanding of the subwatershed, and to prepare a plan that would maintain and enhance a healthy ecosystem in the presence of nearby development. The Study Goal of the CRSWS was "to develop and implement appropriate strategies in order to protect, enhance and restore the natural resources of the Carp Watershed under present conditions and as land use changes occur". Four environmental goals were identified in the report:

- **Goal 1:** "Surface/Ground Water Quality Ensure that the hydrologic regime (surface drainage to wetlands, ponds and watercourses, as well as flows in the groundwater system) of the watershed is suitable."
- Goal 2: "Surface/Ground Water Quality Protect the quality of surface waters in wetlands, ponds and streams."
- **Goal 3:** "Aquatic Resources Establish a healthy aquatic ecosystem, which supports resident, cold water and warm water fish populations."
- Goal 4: "Terrestrial Resources Establish a healthy terrestrial ecosystem."

The Mississippi Valley Conservation Authority (MVCA) has reviewed the actions of the CRSWS to determine what has been completed. Floodplain mapping for Poole Creek and Feedmill Creek have recently been finalized, new targets for water quality have been established and four monitoring reports have been completed. The main restoration project from Hazeldean Road to Richardson Side Road, app. 5.5 km is at the final design stage. This Carp River Restoration Plan incorporates many of the actions for improvements to surface water quality and erosion control in relation to Poole Creek and Feedmill Creek. MVCA has completed work in these areas and has identified areas for restoration, realignment and fish habitat protection.

Table 1 in Appendix A provides a detailed summary of the objectives of the Subwatershed Plan. Not all of the objectives initiated by the CRSWS have been completed to date.

Due to the watershed hydrology and the extensive sediment loading from both rural and urban uses, most tributaries and the Upper Carp River have insufficient stream power to transport sediment out of the reach. This results in aggradation and sediment build-up. This shows that work is needed to maintain a cooler water temperature and to increase flow in the Carp.

3.0 Carp Action Plan

Work by MVCA on the Carp River started in 2012 with a survey of shoreline conditions from Huntmar Drive to Kinburn Side Road. This included mapping the location of blockages to the flow of the river and mapping potential opportunities for stewardship work. All maps showing blockages/obstructions, downed trees and planting and shoreline rehabilitation sites for Carp River can be found in Appendix B.

Since that time MVCA has worked with the Friends of the Carp River (FCR) to start addressing some of the locations of concern. The three main categories are bridges (8 sites), other blockages to flow or navigation (16 sites), and stewardship opportunities (24 sites). In the last two years MVCA has completed the removal of several blockages and the planting of several shoreline sites as detailed below. This work was supported by funding from various grants. FCR have also worked on the removal of downed trees at four locations along the Carp.

3.1 Shoreline Planting

There are a number of sites that require tree and shrub planting to stabilize banks and provide shade canopy. Riparian zone plantings are recommended along 24.2 km of Priority 1 tributaries and 9 km of Priority 1 Carp River. Within the last two years, over 2000 trees and shrubs have been planted along the shoreline of the Carp River. The planting will help stabilize the banks, slow runoff, improve water quality, provide habitat for fish and wildlife and contribute aesthetic value to the properties. Planting was completed along a total of 1500 metres of river and stream shoreline.

There are continuing challenges for the areas along the tributaries and the Carp River, which include engaging landowners.

3.2 Blockage Removal

There are 24 locations of concern regarding blockages, including 8 bridges and 16 other types of blockages/obstructions. Removal of prioritized blockages would improve the flow and function of the river, especially in high water conditions, alleviating upstream flooding. Obstructions limit baseflow in the river allowing water to pool and remain stagnant. To date, one natural blockage and two collapsed man-made crossings that were creating blockages were removed. Concrete, wood and steel were removed from the river and the riverbank sites were graded to re-establish the natural riverbank morphology. MVCA returned to the site and completed the project by planting trees and shrubs to stabilize and naturalize the sites. All areas with blockages are identified in Table 2 in Appendix C. Maps have been forwarded to the City of Ottawa (May 2015 for potential removal of woody debris).

The following seven priority sites are recommended for rehabilitation:

- Site #19, an active farm crossing made up of 2 long stone approaches into the river and a culvert. Significantly narrows the river and can hold back flows until bridge over tops. Will require an engineered design to create a new suitable bridge, the removal of the old bridge and the construction and installation of a new bridge. This is likely the most expensive site to remediate and would require multiple funding partners or project specific grant applications.
- 2) Site #20, an active farm crossing made up of two layers of bridge which increases the amount of water held back during a high water event before the bridge is over topped. Will require an engineered design to create a new suitable bridge, the removal of the old bridge and the construction and installation of a new bridge. This is likely the most expensive site to remediate and would require multiple funding partners or project specific grant applications.
- 3) Site #27, a potentially active farm crossing that is made up of stone cribs and a cement deck which are holding back water and catching a lot of debris. If active then the bridge would need to be replaced with a longer span design.
- 4) Site #35, a potentially active farm crossing with a wooden deck that is catching a lot of debris. If active then the bridge would need to be replaced with a better design.
- 5) Site #37, an abandoned bridge consisting of old rail ties and stone cribbing. Rail ties catch debris and cribbing creates a narrow spot holding back water. The landowner on the west bank is agreeable to its removal; the landowner on the east bank is not.
- 6) Site #13, remains of a bridge cribbing causing an obstruction to medium flows. Also has a downed tree on the west bank, upstream side. Not an obstruction to fish.
- 7) Between March and Carp Roads, restoration of the area to address the reach of the Carp River that is in a degraded state, and improve a key eco-linkage between natural heritage areas in Kanata North and the Carp Hills

Table 5.0 provides a summary of the costs for the removal of the obstructions and the restoration of the area.

Location	Obstruction/Restoration	Cost	Compensation
Site #19	Failing bridge with 8 foot culvert		TBD
2590 Diamondview Road	and concrete block abutments	\$25,000-\$50,000 removal	
Site #20	Old farm bridge	\$15,000-\$30,000 removal	TBD
2502 Diamondview Road			
Site #27	Potentially active farm bridge	\$25,000-\$50,000 removal	TBD
2931 Diamondview Road			
Site #35	Potentially active crossing	\$5,000-\$15,000 removal	TBD
3353 Diamondview Road			
Site #37	Abandoned bridge with 2 large	\$5,000-\$15,000 removal	TBD
3444 John Shaw Road	pails blocking flows		
Site #13	Remains of bridge cribbing and	\$5,000-\$15,000 removal	TBD
2270 Diamondview Road	downed tree		
1.5km section between March	Restoration of area that is in	\$20,000 to review and update	
and Carp Roads	degraded state and provision for	2004 report. Potential cost	
	community access	sharing with Ducks Unlimited	
		and the City of Ottawa	

Table 5: Priority Sites - Summary of Costs for Restoration/Removal Of Obstructions

Photos for the above sites with blockages can be found in Appendix B.

Table 2 in Appendix C provides a detailed description of all the Carp River barrier removal and stewardship opportunities.

3.3 City Stream Watch

In 2013, MVCA began implementing a stream watch program, enlisting the help of community volunteers to monitor the condition of tributaries flowing into the Carp River. Benefits of the stream watch include better understanding of the aquatic and terrestrial environment, community involvement in stewardship and restoration, and cost effective acquisition of data through community volunteering. With the help of Shell funding, MVCA was able to expand the program in 2014, monitoring 118 sections along Huntley Creek, a main tributary of the Carp and 28 sections along Watts Creek. A permanent City Stream Watch program is required to monitor water quality and stream morphology on all Carp tributaries. Public participation to date has been positive, however the program operates on a limited budget.

3.4 Engineered Restoration

A total of 2km of shoreline has been identified for engineered restoration along the Carp at two key sections. The two areas are: a stretch immediately downstream of the Huntmar Road bridge (0.5km) and a stretch from March to Carp Road at the entrance of the Village of Carp (1.5km – Identified as Priority 1 in the Carp Subwatershed Study). The restoration of ox-bows in straightened portions of the river would improve: conveyance of floodwaters, transport of sediments, ecological productivity, and bank stability/reduced erosion and sediments. Recently, Ducks Unlimited and the City of Ottawa completed habitat enhancement on private property just North of Huntmar Drive.

The section of the river between Richardson Side Road and the Huntmar bridge was also identified in the Action Plan as seriously degraded and in need of restoration. City staff have indicated that restoration of this section will likely come about as part of the normal course of development in the area, so no action is recommended in this report.

In 2004, the FCR commissioned Aquafor Beech Limited and Robinson Consultants Inc to prepare the Carp River Remediation Project Report to address restoration of the 1.5km section of the river between March and Carp Roads. The report listed objectives and three project alternatives to restore the environmental health of the river and its streamside environment by re-establishing the morphological characteristics of the channel. It also specified pathways and viewing areas to make the area available to the community. The restoration would allow the river to maintain its channel and improve habitat diversity, and is fully supportive of the City's eco-corridor linkage plan for natural heritage areas (as per Dr. Nick Stow). The three project alternatives that were developed based on this criterion were: Restoration (restore river to meander pattern), Enhancement (partial re-establishment of a meandering morphology) and Remediation (construction of a riverine wetland morphology). Of the three, the Remediation option was selected as the best project alternative. However, all three of the project options were cost prohibitive and as a result, no work has been completed for the restoration on March and Carp Road for the Carp River. It is recommended that the study be updated and potential work be scaled over several years based on phasing and costing: of \$250,000, \$500,000, \$750,000. Ducks Unlimited have expressed interest in partnering on restoration of this area.

4.0 Challenges

While there has been significant progress on improving the health and awareness along the Carp River, some challenges remain.

4.1 Landowner Participation

As identified in the CRSWS, most of the recommendations of the Subwatershed Plan must take into consideration the cooperation, consent and environmental stewardship of the landowner. The implementation of the Subwatershed Plan also requires an extended time frame and may require 30 years to complete.

In the first year, several landowners were receptive to the MVCA working on improvements for the blockages, but it is becoming more and more difficult to find willing landowners. Compensation may be required in order to gain cooperation.

4.2 Funding

Additional funding is required to move forward with initiatives of the Carp Action Plan. The Shell grant ends in 2015 and multiple partners will be required to work together to ensure the priorities identified are completed.

5.0 Summary

The objectives of the CRSWS have not been completed and there are still several outstanding actions. The area from Hazeldean Road to Richardson Side Road is subject to a major restoration initiative and it is expected that the area from Richardson Side Road to the Huntmar bridge will be addressed by future development activities. There is no funding secured for work downstream of the main restoration area. The successful completion of the outstanding actions will benefit the Carp River by supporting a diverse aquatic habitat, providing improved conveyance and habitat and improving water quality.

The following actions are recommended and should be phased in over a 3 - 4 year time frame based on obtaining funding:

1. Remove Blockages as identified: of the blockages identified, most cause an obstruction to both flow and navigation. The removal of the identified blockages are of high priority and are predicted to improve the function of the river (costs identified in Table 5.0). (5 sites at average \$20 k each = \$100 k)

- 2. Continue funding to City Stream Watch and Shoreline planting: the stream watch and the shoreline planting are both important recommendations to the Carp Action Plan because the planting will improve the habitat and quality of the water and the stream watch program will ensure long term monitoring of water quality and stream morphology. (\$75 k per year)
- 3. Restoration of Key Area (March Carp Road) with interested partners including, private landowner City of Ottawa and Ducks Unlimited (Initial study \$20 k, phasing up to \$250 k \$750 k).

Funding for these initiatives will ensure that the health of the Carp River will be monitored and improvements will continue as per the CRSWS.

Appendix A - Review of Actions and Objectives of Carp River Watershed Plan

Table 1. Review of actions and objectives of Carp River Subwatershed Plan (2004) and work that has been completed towards these goals as of June 2015.

Item	Action	Next Steps	Facilitator / Contributor	Policy Considerations	Implementation Mechanisms	Costs
SURFACE	· WATER MANAGEMENT PLAN - FLOOD CONTROL	•				
1	Assess impacts of floodplain modifications resulting from stream restoration works along upper Carp from Glen Cairn pond to Richardson Side Road	City to coodinate as part of overall function design and environmental assessment for Carp River Corridor Restoration Plan	City, CA, landowners	may require 2 zone approach	include in the Carp River Corridor Plan project	
2	Undertake Floodplain Mapping for Carp River, Poole Creek, and Feedmill Creek downstream of Highway 417	Studies to be lead by the City with developer/landowners participation	City, CA, landowners		include in the Carp River Corridor Plan project	Carp River TBD Poole Ck/Feedmill Ck \$100,000
SURFACE	WATER MANAGEMENT PLAN - EROSION AND SEDIMENT	CONTROL	1	1		-
3	Carp River Corridor Plan: Restore upper Carp River to riverine wetland with floodplain features and recreational trail system (approximately 5000 m)	City to undertake functional design and environmental assessment with funding provided through a number of sources: benefiting landowners, all landowners in Kanata West planning area, entire drainage area	City/CA	may be EA requirement modify floodplain policy Kanata West Concept Plan	City to lead and coordinate study	
4	Protect stream corridors along Carp (100 m), Poole (80 m) (downstream of old dam) and Feedmill (70 m) downstream of Queensway	Implement as part of development review and approval process. Dedicate to the City as public open space	City/CA	Official Plan Policies Floodplain Policy Infrastructure Master Plan	Kanata West Concept Plan City to approve terms of reference for EMP studies	cost related to land priced as hazard constraint
5	Implement natural channel design restoration for designated reaches of Poole and Feedmill (approximately 1000 m)	Functional design to be funded by developers/landowners	landowner	Official Plan Policies Environmental Strategy Infrastructure Master Plan	City to approve terms of reference for EMP studies	Estimated Cost (1 km @ \$600/m) = \$600,000
6	Implement GREE design restoration for designated reaches of Poole (approximately 800 m)	Functional design to be funded by developers/landowners	landowner	Official Plan Policies Environmental Strategy Infrastructure Master Plan	City to approve terms of reference for EMP studies	Estimated Cost (1 km @ \$600/m) = \$600,000
7	Restore lower reaches of Poole and Feedmill Creek to riparian wetland systems contiguous with Carp River Corridor plan (approximately 1000 m)	City to coodinate as part of overall function design and environmental assessment for Carp River Corridor Restoration Plan	City/CA	may be EA requirement modify floodplain policy	City to coordinate study	\$600,000
8	Implement Source Control Measures as part of Stormwater Management system	City to approve terms of reference for detailed studies Developers/landowners to undertake functional design	landowners	MOE Stormwater Management & Design Guidelines Infrastructure Master Plan	EMP/development application City to approve terms of reference for EMP studies	dependent on type of BMP
9	Require all new facilities to implement groundwater infiltration wherever feasible and to control post development erosion flows to within 5% of existing	City to approve terms of reference for detailed studies Developers/landowners to undertake functional design	landowners	Official Plan Policies MOE Stormwater Management & Design Guidelines	EMP, City to approve terms of reference for EMP studies	Reflected in cost of
10	New SWM facilities must meet the water quality and runoff targets specified for each watercourse	management system on a tributary basis demonstrating water quality targets will be met	landowners	Official Plan Policies MOE Stormwater Management & Design Guidelines	EMP, review SWM options	stormwater management facility and source control BMPs

	Work Completed
le	UNDERWAY Poole Creek and Feedmill Creek floodplain
	mapping are underway. Carp River floodplain mapping plans
	exist.
	property located North of Huntmar Drive.
	COMPLETED.
	PLANS EXIST. Future Plan: re-alignment in priority 1 stretch
m @	of Poole Creek and Feedmill Creep (Carp River Restoration
0	Plan).
m @	
0	NOT COMPLETED.
	PLANS EXIST. These plans exist in the Carp River Restoration
	Plan.
of	
	UNDERWAY.
	LINDERWAY Tanger Outlets has implemented low impact
	development measures (Cisterns) with the goal of post-
	development infiltration rates to be increased by 25 percent
	above the pre-development rate as directed by the master
	servicing plan. The Cabella's development as well as West
	designs to meet these goals.
ÿ	
	ONGOING.

Item	Action	Next Steps	Facilitator / Contributor	Policy Considerations	Implementation Mechanisms	Costs
GROUNDW	VATER MANAGEMENT PLAN		ļ	,	ļ	
11	Prepare a groundwater characterization study on a tributary drainage basis to determine groundwater gradients & divides, to preserve groundwater discharge (baseflow), to assess feasibility of infiltration- based stormwater management BMPs and to maintain a pre-development water balance.	City to approve terms of reference for detailed studies as part of the development review process	landowners	Official Plan policies Groundwater Management Strategy Infrastructure Master Plan	EMP plus groundwater studies	
GREENLAN	ID PLAN - TERRESTRIAL				1 0	
12	Protect Category 1 Areas (see detailed description in Section 8.4.3) - Centres of Ecological Significance, candidate ANSI's, High NESS Areas, natural features in high recharge areas, wetlands, riparian corridors.	Study required to identify candidate Natural Environment Areas. Changes to OP maybe necessary to ensure that Category 1 features are protected. List of Centres of Ecological Significance to be added to City's acquisition program	City	Official Plan Policies Greenspace Master Plan	use EMP to require EIS incorporate in City's Acquisition Plan	fair market appraisal based on land use/ zoning/ purchases of like land
13	Conduct EIS on all Category 2 features (see detailed description in Section 8.4.3) -woodlands contiguous with Level 1/2 riparian corridors, features in low/moderate recharge, adjacent lands (30 or 120 m setbacks) - applies only to development applications	Require EIS to be completed on all development applications in Category 2 areas	City, MVCA, developers, landowners	City to review Official Plan policies and expand EIS requirement to include all Category 2 features (OPA)	Develop OP mechanism for EIS requirement for development applications	about \$2,000 - \$3,000 per EIS
14	A stewardship/education program to promote protection and regeneration of Category 3 areas (see detailed description in Section 8.4.3) to a natural state. A stewardship/education program to promote protection and enhancement of Category 1 areas (see detailed description in Section 8.4.3)	Identify landowners and current protection status. For publicly owned lands prepare management plan to guide activities and restoration	City, CA, MNR, landowners	Greenspace Master Plan	use Forest Management / Environment strategy as a guide good Forest Practices Bylaw	
15	Review current aggregate operations in Feedmill headwaters and review opportunities to augment baseflows in both Feedmill and Poole. Confirm that rehabilitation plan devotes restoring significant lands to natural state	City and MNR to initiate discussions with aggregate producer	City, MNR, MOE, CA	Source Protection Planning Regional Groundwater Study Water Taking Permit	assess groundwater / surface water impacts review rehab. plans and final land use designation	
GREENLAN	IDS PLAN - STREAM AND VALLEY CORRIDOR SYSTEM					-
16	Protect valley and stream corridors along upper Carp, Poole and Feedmill Creeks (See Section 8.2)	corridors identified in subwatershed City to incorporate corridors in EMP's for individual installments	City, CA, landowner	Official Plan Policies Kanata West Concept Plan	EMP/development application	land dedication
17	Maintain key functions of valley and stream corridors in Hazeldean and Unnamed Tributaries	corridors identified in subwatershed City to incorporate corridors in EMP's for individual installments	City, CA, landowner	Official Plan Policies Kanata West Concept Plan	EMP/development application	land dedication
GREENLAN	IDS PLAN - RECREATION				1	1
18	Recreational trail system	Incorporate into the Carp River Corridor Plan functional design and the Poole Creek and Feedmill Creek restoration plans. Delineate pathway location through development review process.	City, landowners	Official Plan Policies Kanata West Concept Plan	coordinate with other development study requirements, particularly infrastructure	land dedication

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UNDERWAY. Constantly being improved as time goes on.

UNDERWAY.Area protected under Official Plan: Hazeldean Road to Richardson side road under Carp River Restoration Policy UNDERWAY. Implemented through Development Review. NOT COMPLETED.		
UNDERWAY. Implemented through Development Review.		UNDERWAY. Area protected under Official Plan: Hazeldean Road to Richardson side road under Carp River Restoration Policy
UNDERWAY. Implemented through Development Review.		
UNDERWAY. Implemented through Development Review. NOT COMPLETED.		
UNDERWAY. Implemented through Development Review. NOT COMPLETED.	C	
NOT COMPLETED.		UNDERWAY. Implemented through Development Review.
NOT COMPLETED.		
		NOT COMPLETED.
	_	

PLANS EXIST.

UNDERWAY.

NO WORK COMPLETED TO DATE. Future Plans: Carp River Remediation Project has 1.4 km of trails planned. No new trails planned for Feedmill Creek or Poole Creek. Table 1. Review of actions and objectives of Carp River Watershed Plan (2004) and work that has been completed towards these goals as of June 2015.

			Facilitator /			Estimated Costs	Estimated Money	
	Action	Next Steps	Contributor	Policy Considerations	Implementation Mechanisms	(CWP)	Spent (To Date)	Work Completed
SURFA	CE WATER MANAGEMENT PLAN - FLOO	D CONTROL			•			
	Program emphasis on reducing							
	flooding impacts on agricultural lands							
	through stream restoration,							
	wetland/forest protection measures as							
1	described below	See Action Items 2, 4, 5, 16, and 17						SEE BELOW.
SURFA	CE WATER MANAGEMENT PLAN - EROS		r	1	1	1	1	1
		Work with farmers to address potential Nutrient						
		Management Act (NMA) issues -Integrate as nart						
		of drain maintenance program under Drainage						
		Act - Classify reaches for restoration and develop		review opportunities to	stewardshin - maintain and	(28.4 km @	nothing used yet	UNDERWAY Future
	Stream restoration using natural	restoration templates for different stream types -	City MVCA	require natural channel	expand Rural Clean Water	(20.4 km) =	Planned: \$600,000 for	design) Carn River R
	channel design and engineered natural	Use in-kind support from public agencies	Landowner	design under Drainage	Program - use Drainage Act -	\$7,000,000	Carn River segment	(ann 5 5km) and the
	channel measures along 15.4 km of	farmers interest groups - equipment Jahour	Special interest	Act: - draft topsoil by-	provide education/training to	(assumes in-kind	\$500.000 for Priority 1	corridor re-alignmer
	priority 1 tributaries and 13 km of	materials - Develop demonstration projects for		law: - prepare fill	Drainage Engineers on natural	support and use of	tributaries Remaining:	of Huntmar Bridge (P
	priority 1 Carp Pivor cogmonts	funding under Pural Clean Water Pergram	MNIP DEO	rogulation	channel design	ovicting programs)		Diannod: 2 4km of n
				legulation			\$7,000,000	<u>rianneu. <u>2.4km</u> or p</u>
	Control livestock access restrictions	Utilize Rural Clean Water Program and expand						UNDERWAY. REQUIE
	and installation of alternate watering	stan complement to implement program - Use In-			stewardship - maintain and		Used through Rural	Creek (Priority 1) and
	sources on livestock operations in	kind support - equipment, labour, materials -	City, MIVCA,		expand Rural Clean Water		Clean Water Program:	Water Program to re
	priority 1 subwatersheds and along		Landowner,		Program, MVCA programs,	(28.4 km @ \$12/m)	\$/3/7. Remaining:	source. Still many act
3	priority 1 Carp River segments	ISSUES	OMAF	none	OMAF	= \$340,000	\$335 000	targeted with this pro
								UNDERWAY. SOME F
								Carp River have parti
				City to consider a clearer				Forestry Program or
			City, MVCA	, Riparian/Floodplain				shoreline (3.1 km on
		Provide funding for staff complement to	Landowner.	designation in OP to	stewardship - maintain and		Used through Rural	along a Priority 1 Cre
	Riparian zone plantings along 24.2 km	implement program - Use in-kind support -	Special interest	include Carp River.	expand Rural Clean Water	(33.2 km @	Clean Water Program:	planted along the sho
	of priority 1 tributaries and 9 km of	equipment, labour, materials - Work with farmers	, groups, OMAF.	Municipal Drains and	Program - Utilize tree planting	\$2.500/km) =	\$10610. Remaining:	creeks and 4.6km has
4	priority 1 Carp River segments	to address potential NMA issues	DFO. MNR	Tributaries	grant programs	\$83.000	\$73000	2.8km/9km planted.
						+/		
				City to consider a clearer				
			City, MVCA,	Riparian/Floodplain				
		Provide funding for staff complement to	Landowner,	designation in OP to				
		implement program - Use in-kind support -	Special interest	include Carp River,	maintain and expand Rural	(18.2 km @		UNDERWAY. NEEDS
	Riparian plantings along 18.2km of	equipment, labour, materials - Work with farmers	groups, OMAF,	Municipal Drains and	Clean Water Program - Utilize	\$2500/km)		Priority 2 creek neare
5	priority 2 streams	to address potential NMA issues	DFO, MNR	Tributaries	tree planting grant programs	=\$45,500	N/A	shoreline is planted.
					l	Equipment	Used through Rural	UNDERWAY. NEEDS
					consider purchase and lease	purchase: about	Clean Water Program:	Unnamed Priority 1 (
	Implement conservation land				program through Rural Clean	\$30,000-\$50,000	521 815 (for erosion	erosion on farms (cro
	management practices on about 4500	Expand grant program under Rural Clean Water		may be addressed	Water program - audit	shared among	control). No sharing of	Arlene Ross and get f
	ha of priority 1 and about 2500 ha of	Program to allow equipment purchase -	City, OMAF,	through phase in of	Environmental Farm Plans;	several farmers (1	equipment.	management of ferti
	priority 2 agricultural lands to reduce	Encourage sharing of equipment among farmers -	MVCA,	Nutrient Management	update Nutrient Management	set of equipment/5	Remaining: \$30 000-	crops, conservation t
6	soil erosion	Develop lease program	landowners	Act	Plan	tarms)	\$50 000	program.

**Notes: Information is from Rural Clean Water Program, Private Land Forestry Program and Friends of Carp River. The stewardship that has been discussed is from landowners properties that are adjacent to the Priority 1 Carp River segments or Priority 1 tributaries.

Plans: Carp River Remediation Project (app. 1.4 km of new channel testoration Project - re-alignment and full restoration of the mainstem e construction of seven off-line habitat ponds within the Carp River nts in Poole Creek and Feedmill Creek. Carp River Restoration Downstream Prior Land, Ducks Unlimited): channel re-design (app. 1.4km). Total priority 1 Carp River segment. <u>2km</u> of Priority 1 tributaries planned.

RES MORE WORK. One farm along the Carp River, one farm along Huntley d one farm along a Priority 2 Creek, have gone through the Rural Clean estrict livestock from water/ provide them with an alternative watering tive farms along the Carp River and Priority 1 and 2 Creeks that need to be ogram.

PLANTING COMPLETED, NEEDS MORE WORK. 16 landowners along the icipated in a planting program (Rural Clean Water Program, Private Land MVCA Shoreline Naturalization program)involving planting along the west side of river, 2.5km planted on east side of river). 12 landowners eek have participated in a planting program, of the 12, 9 have some oreline (app. 4.1km of shoreline has been planted on the west side of s been planted on the east side of creeks). TOTAL: Carp River: app. Priority 1 tributaries: app. 4km/24.2km planted.

MORE WORK. Private Land Forestry Program - one landowner along est the Ottawa River, planted 500 trees, but only 200m of their 550m TOTAL: 0.2km/18.2km planted.

MORE WORK. Three landowners (one on Carp River and two on Creek C) have participated in the Rural Clean Water Program to reduce soil opping practices, erosion control, fragile land retirement).Need to talk to farmers educated and on board - tillage practices, cropping practices, ilizer/manure application rates/timing, crop rotation/strip cropping, cover tillage. Existing programs do not include purchase of equipment or lease

	Action	Next Steps	Facilitator / Contributor	Policy Considerations	Implementation Mechanisms	Estimated Costs (CWP)	Estimated Money Spent (To Date)	Work Completed
7	Maintenance of roadside ditch systems to address erosion and sedimentation problems	Prepare guidelines on best maintenance practices to reduce sediment contribution from roadside ditches	City	Implement as part of drain maintenance program under Drainage Act and/or ongoing O&M program for rural roadside ditches	incorporate costs into regular operating and maintenance budget for roads	(\$600/m) - incorporate into municipal road O&M costs	Remaining: \$600/m	UNDERWAY. Implem Council on July 9, 200
8	Site specific erosion control measures (livestock access control, instream/roadside grade controls, streambank stabilization) in priority 2 streams	Identify priority stream reaches and specific erosion control measure. Provide funding for staff complement to implement program - Use in- kind support -equipment, labour, materials - Work with farmers to address potential NMA issues - Develop demonstration projects	City, MVCA. Landowner, Special interest groups, OMAF	City to consider a clearer Riparian/Floodplain designation in OP to include Carp River, Municipal Drains and Tributaries	maintain and expand Rural Clean Water Program - use Drainage Act	Stream works (\$250/m) Fencing (\$12/m) (assumes in-kind support and use of existing programs)	Used through Rural Clean Water Program: \$2573	UNDERWAY. NEEDS has participated In th
SURFA	CE WATER MANAGEMENT PLAN - SURF.	ACE WATER QUALITY				μ. σ. γ	÷	· · ·
9	Implement non -structural BMP's on all farmsteads on priority 1 and 2 agricultural lands, beginning with those operations contributing directly to priority 1 and 2 tributaries and priority 1 Carp River segments (approximately 50 farms)	Work with farmers to address potential NMA issues - Provide funding for staff complement to implement rural programs and provide technical support -Prioritize farms for work and help farmers develop remediation plans - Use in-kind support - equipment, labour, materials - Increase Rural Clean Water Program funding and grant structure	City, MVCA, OMAF, Landowner	may be addressed through phase in of Nutrient Management Act - may use section of Drainage Act to prohibit discharge of pollutant to Drains	stewardship - maintain and expand Rural Clean Water Program, MVC programs, OMAF programs - OMAF may provide technical support to help farmers address problems before they are regulated under N.M. Act	\$3,000 per farm = \$150,000	Nothing used. Remaining: \$150 000	NOTHING COMPLET Non-structural manu berming to keep clea berming adjacent to storage/handling fac implemented on a pr provide technical sup under the Nutrient M
<u>10</u>	Implement structural BMP's on all farmsteads contributing directly to priority 1 tributaries and priority 1 Carp River segments (approximately 20 farms)	Work with farmers to address potential NMA issues - Provide funding for staff complement to implement rural programs and provide technical support -Prioritize farms for work and help farmers develop remediation plans - Use in-kind support - equipment, labour, materials - Increase Rural Clean Water Program funding and grant structure	City, MVCA, OMAF, Landowner	may be addressed through phase in of Nutrient Management Act - may use section of Drainage Act to prohibit discharge of pollutant to Drains	stewardship - maintain and expand Rural Clean Water Program, MVC programs, OMAF programs - OMAF may provide technical support to help farmers address problems before they are regulated under N.M. Act	\$20,000 - \$40,000 per farm = \$800,000	Nothing used. Remaining: \$800 000	NOTHING COMPLET Structural manure/fe and liquid storage fac participated in Rural treatment. in 2009-2 support to help farm Management Act.
GROUI						1	1	1
11	Implement the eight elements of the City's Groundwater Management Strategy	Implement as part of provincial program on Source Water Protection	City/MVCA	City and CA to implement recommendations of regional studies	City to implement recommendations of regional studies - update guidelines on Watershed / Subwatershed Plans to include source protection Plans	Not available	N/A	UNDERWAY. Source approved, implement Groundwater resource Groundwater use ass management. 7. Eme management practice

**Notes: Information is from Rural Clean Water Program, Private Land Forestry Program and Friends of Carp River. The stewardship that has been discussed is from landowners properties that are adjacent to the Priority 1 Carp River segments or Priority 1 tributaries.

nented through Development Review. Ditch Alteration Policy approved by 08.

MORE WORK. One landowner on Priority 2 stream beside Corkery Creek ne Rural Clean Water Program to restrict livestock from water.

ED TO DATE. According to CRWP these are what need to be implemented: ire/feedlot storage and handling BMPs such as: eavestroughing and an runoff from becoming contaminated by manure/feedlot storage areas, waterbodies to keep contaminated runoff away from the stream, siting of ilities and feedlots away from waterbodies. * Rural BMPs should be riority basis. In 2009-2010, OMAF Ministry Strategies and Priorities is to opport to help farmers addressing problems before they are regulated Management Act.

ED TO DATE. According to CRWP these are what need to be implemented: eedlot storage and handling BMPs such as: covered storage facilities solid cilities, runoff storage facilities. One landowner on Priority 2 subwatershed Clean Water program and improved manure storage/ wastewater/ 2010, OMAF Ministry Strategies and Priorities is to provide technical ers addressing problems before they are regulated under the Nutrient

Protection Plans have been submitted to MOE for approval. Once tation will begin. 1. Public consultation, awareness, involvement. 2. ce definition. 3. Identification of potential contaminant sources. 4. sessment. 5. Groundwater quality and level monitoring. 6. Data ergency preparedness, response and contingency plan. 8. Best res, protection policies and legislation.

Facilitator / Estimated Costs Estimated Money								
	Action	Next Steps	Contributor	Policy Considerations	Implementation Mechanisms	(CWP)	Spent (To Date)	Work Completed
12	Develop the groundwater management strategy to address potential contaminant sources and source protection.	Kinburn and Fitzroy Harbour are high priorities - Additional staff resources may be required for inspection	City, MVCA	City has completed study identifying sites - Groundwater Management Strategy	- staff resources required to complete inspections - need Program to target boundaries and ensure works done - City implement groundwater management strategy	Septic system re- inspection may be self-financed (set fee per household). Contaminant inventory done (2003)Landfill monitoring <\$100,000 per site	Used through Rural Clean Water Program: \$34 380.	UNDERWAY . In the C faulty systems (cover Clean Water Progran Carp River Watershe
13	Implement Rural BMP's on agricultural lands in high/moderate recharge (priority 1 and 2 agricultural areas)	See rural BMP measures above		See Rural BMPs above (Action Items 6, 9 and 10)	Stewardship/private land ower initiated	Equipment purchase: about \$30,000-\$50,000 shared among several farmers (1 set of equipment/5 farms)\$3,000 per farm = \$150,000\$20,000 - \$40,000 per farm = \$800,000 (duplicated under conservation tillage and rural BMP measures above)	Nothing used. Remaining: \$800 000	NOTHING COMPLET source control practi restoration, stream r restoration/reforesta during construction, livestock access cont management (strean structural), fragile lar channel design princi irrigation manageme
14	Develop a more detailed record of actual water takings from surface and groundwater supplies	Implement through existing programs	MOE, MVCA	Permit to Take Water Program	Program currently under review	May be small incremental cost to existing programs	N/A	COMPLETED. MOE p (per annum), as avail 2013).
15	Require hydrogeological investigations for land development proposals (MOE Guideline D5-5)	Prepare hydrological study guidelines as per MOE Guideline D5-5 and integrate groundwater characterization requirements	City, MVCA, MOE	Guideline to support policies	development approval process	\$3,000 - \$50,000 per development (small scale developments)	N/A	ALREADY OCCURS. In
GREEN	ILAND PLAN - TERRESTRIAL							
16	Protect Category 1 Areas (see detailed description in Section 9.2.3.2) - Centres of Ecological Significance, candidate ANSI's, High NESS Areas, natural features in high recharge areas, wetlands, riparian corridors.	City to include Centres of Ecological Significance in Official Plan policy and acquisition budgets - Consider incentives to landowners who protect Category 1 areas - Develop stewardship program to work with landowners on feature protection	City, MVCA, MNR, landowners, interest groups, corporations,	City to examine natural area policies in Official Plan to ensure protection of all Category 1 features are captured (OPA one mechanism)	City to incorporate Category 1 features, particularly Centers of E.S. in OP, Greenspace Master Plan and Acquisition Budget; Encourage landowners to protect/ rehabilitate features - City to undertake study to identify protection approach for Category 1 Areas	To be determined as part of acquistion strategy	N/A	UNDERWAY. Implem Master Plan: High NE protected (Carp River considered under lan Wetlands South and and Major Open Spac Natural Environment Features and Major (development.Area pr under Carp River Res 1 areas'.
16 **Note	description in Section 9.2.3.2) - Centres of Ecological Significance, candidate ANSI's, High NESS Areas, natural features in high recharge areas, wetlands, riparian corridors. es: Information is from Rural Clean Water	City to include Centres of Ecological Significance in Official Plan policy and acquisition budgets - Consider incentives to landowners who protect Category 1 areas - Develop stewardship program to work with landowners on feature protection r Program, Private Land Forestry Program and Frier	City, MVCA, MNR, landowners, interest groups, corporations, nds of Carp River.	Plan to ensure protection of all Category 1 features are captured (OPA one mechanism) The stewardship that has	Encourage landowners to protect/ rehabilitate features - City to undertake study to identify protection approach for Category 1 Areas been discussed is from landowne	To be determined as part of acquistion strategy rs properties that are	N/A e adjacent to the Priority	Natural Feature develop under C 1 areas' 1 Carp F

CRWP: initiate a septic system inspection program and repair/replace red under groundwater program). This has been completed with Rural n; 19 landowners have had a septic system repair/replacement since the d Plan was created in 2006.

ED TO DATE. According to the CRWP some examples are: Municipal ices, infiltration facilities, urban retrofitting, buffer zones, aquatic habitat restoration/natural channel design, terrestrial habitat ation, wetland creation, public education, erosion and sediment control groundwater recharge and baseflow protection, source protection plans, crol, fertilizer/manure management (on-field measures), fertilizer/manure nside measures), manure/feedlot storage and handling (structural and non-ind management, road side ditch and drain maintenance using natural iples, milkhouse waste management, pesticide storage and management, ent replace fault septic systems.

artnered with Conservation Ontario and provide actual water taking stats lable on OPEN PORTAL (Ontario Partner Environmental Network) (as of

nplemented through Development Review.

nented through Development Review. Protected under Greenspace ESS significant wetlands are protected, high ANSI and NESS areas are r, Feedmill Creek and Poole Creek riparian corridor). These areas are nd use designations that are Natural Environment Area and Significant East of the Canadian Shield in the Greenbelt, plus Urban Natural Features ce elsewhere in the urban area. Lands designated Significant Wetlands and t Area are publicly owned. Most of the lands designated as Urban Natural Open Space are publicly owned and the designation restricts rotected under Official Plan: Hazeldean Road to Richardson side road storation Policy. Nothing on Centres of Ecological Significance or 'Category

or Priority 1 tributaries.

			Facilitator /			Estimated Costs	Estimated Money	
	Action	Next Steps	Contributor	Policy Considerations	Implementation Mechanisms	(CWP)	Spent (To Date)	Work Completed
17	Conduct EIS on all Category 2 features (see detailed description in Section 9.2.3.2) - woodlands contiguous with Level 1/2 riparian corridors, features in low/moderate recharge, adjacent lands (30 or 120 m setbacks) - applies only to development applications	Require EIS to be completed on all development applications in Category 2 areas	City, MVCA, developers, landowners	City to review Official Plan policies and expand EIS requirement to include all Category 2 features (OPA, MAP)	Develop OP mechanism for EIS requirement for development applications	about \$2,000 - \$7,000 per EIS	N/A	UNDERWAY. Implem
18	Undertake a stewardship/education program to promote protection and regeneration of Category 1 areas to a natural state (see detailed description of Category 3 areas in 9.2.3.2)	to include Centres of Ecological Significance in Acquisition budgets - Consider incentives to landowners who protect Category 1 areas - Develop stewardship program to work with landowners on feature protection	City, MVCA, MNR, interest groups, corporations, landowners	Environmental Strategy; Greenspace Master Plan	City to expand Rural Stewardship Exhibit to all Client Service Centres	\$1,500, annual per exhibit	N/A	NOT COMPLETED.
GREEN	ILANDS PLAN - STREAM AND VALLEY CO I	RRIDOR SYSTEM	1		1			r
19	Identify and protect valley and stream corridors adjacent to all classified streams in Municipal planning and/or zoning schedules to ensure their protection as land use change occurs	Review OP to ensure all streams properly protected -improve definition of watercourse in OP to ensure features protected	City, MVCA, MNR, interest groups, DFO, landowners	Official Plan/Fisheries Act/ Conservation Authority Act/Infrastructure Master Plan/Comprehensive Zoning By-laws	Official Plan Policy -Greenspace Master Plan Infrastructure Master Plan/Stormwater Master Plan	- Lands deeded to City as public lands	N/A	PLANS EXIST. Implen
								UNDERWAY. NEEDS landowners. Need to riparian plantings. M
20	Implement a stewardship program to encourage buffer plantings adjacent to all classified streams to reduce sediment loadings to streams	Provide funding for staff complement to implement program - Use in-kind support - equipment, labour, materials - Work with farmers to address potential NMA issues	City, MVCA, MNR, interest groups, corporations, landowners	Environmental Strategy; Greenspace Master Plan	maintain and expand Rural Clean Water Program - Utilize tree planting grant programs		N/A	
GREEN	LANDS PLAN - RECREATION		-		-			
21	Recreational trail system	Identify trail route - Work with landowners to seek cooperation - Develop trail system master plan -Identify opportunities and constraints	City, MVCA, landowners, interest groups	already identified in OP	work with landowner to allow use of private property	N/A	N/A	NO WORK COMPLET trails planned. Identii
22	Environmental Monitoring Program	Agencies to review Carp recommendations and update monitoring programs as appropriate	City, MVCA, MNR, MOE, DFO, landowners, interest groups	agencies to adopt "adaptive management" and build-in monitoring and reporting as tool to assess program success	Agencies to ensure adequate resources available for monitoring -encourage participation by interest groups need to improve monitoring and auditing of monitoring conditions on works	most Agencies need to expand monitoring budget	N/A	UNDERWAY. Friends rainfall recordings of program creation rec monitors the Carp Ri levels and dissolved

nented through Development Review.

mented through Development Review.

MORE WORK. Shoreline Naturalization Program exists and is available to p increase awareness of these programs as many areas would benefit from lay persuade landowners by showing them before/after pictures.

TED TO DATE. Future Plans: Carp River Remediation Project has 1.4 km of ified in OP, Greenspace Master Plan.

s of the Carp River in conjunction with MVCA monitor the water levels and f Carp River. City of Ottawa monitor water quality. City Stream Watch commended for Carp River (In Carp River Study). Ottawa Riverkeeper now iver as of 2013; volunteers are testing for phosphate, nitrate, nitrite, pH oxygen each month.

ts or Priority 1 tributaries.

Appendix B - Prioritized Site Photos















Map of March and Carp Road



Appendix C - Carp River Barrier Removal and Stewardship Opportunities

Carp River Barrier Removal and Stewardship Opportunities

Bridges

Diluges									
Priority	No	Description		Flow Obstruction	Navigation Obstruction	Erosion	Status	Comments	Photo
high (completed)	4	Unused low-level bridge made of railroad rails, lying on cribs. An obstruction to boats, but not flow or fish. East (South) of Craigs Side Road	East (South) of Craigs Side Road	no	yes		Removed (DFO grant) fall 2013		
high (completed)	8	Failed farm bridge, decking mostly gone, abutments are concrete slabs on cribs. Minor issue for flow and fish but is a blockage to navigation		partial	yes		Removed (DFO grant) fall 2013		
high	19	Failing bridge with 8 foot culvert and concrete block abutments. Obstruction to fish passage due to high flow velocities through culvert. Also an obstruction to moderate to high flows because it would act as a weir. In high flows it would over top.		partial to flow, ***fish obstruction	partial			Will be expensive and will require targeted funding/grant application	
high	20	Old farm bridge, debris piling up on west side. Cribs extending into river bed holding up 1 beams. Second deck layer implies revision causing higher upstream water levels. Not an obstruction to fish.		no	yes			Will be expensive and will require targeted funding/grant application	
high	27	Potentially active farm bridge. Catching a lot of debris. Shoreline on both banks in need of planting.		yes	yes	no		Potentially active crossing, a lot of debris being caught. *Also potential planting site #26	
high	35	Potentially active crossing, a lot of debris being caught		yes	yes	no			
high	37	Abandoned bridge, 2 large rails blocking flows at certain levels and catching debris.		yes	yes	no	One landowner is agreeable to its removal, the other is not	MVCA staff contacted landowners in summer of 2014. The Quade's were agreeable to have us offer to remove the rails, and do the work from their side of the river. John Shaw however was not agreeable to this as it is "his bridge" and did not provide permission to proceed.	
low	13	Remains of bridge cribbing causing an obstruction to medium flows. Also has a downed tree on the west bank, upstream side. Not an obstruction to fish.		partial	no			Stone creates diversity of habitat	

Blockage to Flow and/or Navigation									
Priority	No	Description		Flow Obstruction	Navigation Obstruction	Erosion	Status	Comments	
high	12	Downed tree cluster which is catching lots of debris.		partial	partial			Need land owner info, potential for shoreline planting on west bank	
medium	2	Trees within the channel. Not an obstruction to flow or fish. Prevents canoe passage during low flow conditions. West (north)of Donald B Munro		no	yes			FOC intending to do. Working at contacting landowners	
medium	7	Downed tree, currently blockage to navigation, with higher flows might be able to paddle over it. Not an obstruction to flows or fish.		no	yes		Removed (DFO grant) fall 2013		
medium	14	Tree cluster old enough to be growing grass. Partial obstruction to flows and an obstruction to navigation, not an obstruction to fish.		partial	yes		FOC addressed. Winter 2015		
medium	16	Large downed tree cluster catching debris, followed by a smaller downed tree. Not an obstruction to flows or fish.		no	yes			Could access from either bank. East bank is treed, west bank could use some plantings	
medium	15	Large downed tree cluster growing grass and catching debris. Beavers are active in this area. Not an obstruction to flows or fish.		no	no		FOC addressed. Winter 2015		
low	1	Trees within the channel. Not an obstruction to flow or fish. Prevents canoe passage during low flow conditions. East (South) of Donald B Munro	East (South) of Donald B Munro	no	yes			FOC intending to do, March 2014. Working at contacting landowners	
low (completed)	5	Large tree across river near Deifenbunker. In high water conditions would be an issue for navigation. Not an obstruction to fish or flows.	East (South) of Craigs Side Road	no	yes		FOC partially removed. Winter of 2014		
low (completed)	6	Log across river. Not an obstruction to flow or fish. West (north) of Craigs Side Road	West (north) of Craigs Side Road	no	yes		Removed in fall 2013		
low	9	Tree just under water. Not an obstruction to flow or fish, just navigation at this water level.		no	yes			Assessed while on site for #7 and 8, decided to not disturb bank to remove. Potential for FOC to do limbing from river	
low	10	Cluster of downed trees		no	partial			Assessed while on site for #7 and 8, decided to not disturb bank to remove. Potential for FCR to do limbing from river	
low	11	A washed out bridge, passible on the west side. Metal beams and crib stone are a hazard to navigation. Not an issue for flow or fish.		no	yes			Stone creates diversity of habitat	
low	18	Tree cluster catching debris on east bank, just able to navigate on west side. Not an obstruction to flows or fich		no	partial			Better access from west bank, also potential for shore planting here	
low	22	Downed tree cluster and beaver stock pile area.		no	no				

Blockage to Flow and/or Navigation									
Priority	No	Description		Flow Obstruction	Navigation Obstruction	Erosion	Status	Comments	
low	25	Downed tree and debris, can paddle through by west bank. Debris across river. Not blocking flow or canoe		no	no	no			
low	32	Downed tree, debris build up. Looking at west bank.		partial	no	no			

Livestock Erosion and/or Planting Flow Obstruction Navigation Obstruction Erosion Status Priority No Description Comments Showing livestock erosion. Planted as part East (South) of of DFO funding Fencing inadequate. Extends for a significant Craigs Side nn high 3 no no yes portion of the river's west Road Diefenbunker bank. South of Craigs Side site spring 2014 Road Cattle erosion area on the If still active in cattle outside of a bend in the needs fencing, water high 21 no no yes river on the west bank. pumps, and planting, otherwise just planting. Active cattle erosion on Needs fencing, water 43 High no no yes pumps, and shoreline west bank lanting Currently researching Cattle erosion area on east South of land owner contact. Site bank. Electric fence can be Thomas A seen extending to the river Dolan could use top of bank to allow drinking access. Parkway planting once fencing Also shows how fencing and water pumps cattle off the river bank can installed. high 23 no no ves allow vegetation to exist and prevent erosion. Extends from this point to Thomas A Dolan Parkway. South of Thomas A Dolan Parkwav Shrub ploughed over on top South of Thomas A of west bank to allow corn cropping right to the top Dolan edge of the river bank. Parkway 23b no no Extends from this point to Thomas A Dolan Parkway. South of Thomas A Dolan Showing the contrast of South of If still active in cattle shoreline conditions Thomas A needs fencing, water between unfenced pasture Dolan pumps, and planting, on the west (left) and Parkway otherwise just planting. 23c high no no yes fenced pasture on the east (right) just upstream of Thomas A Dolan Parkway. South of Thomas A Dolan Animal erosion for an west of If still active in cattle extended length of Diamond needs fencing, water medium 24 no no yes shoreline. West bank. West View Rd pumps, and planting, of Diamond View Rd otherwise just planting. Livestock erosion, east bank Impacts not as extensive as other livestock river access sites, but could 46 medium no no ves use fencing and water pumps. needs shoreline planting, 26 no no yes east bank, just upstream of #27 Approx 2 kms of shoreline on both the east and west 28-31 no no yes banks in need of planting 33-34 Needs shoreline planting no no yes

Livestock Erosion and/or Planting

Priority	No	Description		Flow Obstruction	Navigation Obstruction	Erosion	Status	Comments
	36	needs shoreline planting		no	no	yes	Planted west bank spring 2014	
	38	Shoreline planting in pockets		no	no	yes	Planted west bank spring 2014	
	39	Shoreline planting		no	no	yes	Planted west bank spring 2014	
	40-41	Needs shoreline planting both banks. West of John Shaw Road	West of John Shaw Road	no	no	yes		
	42	Shoreline planting both banks		no	no	yes		
	44	Shoreline planting both banks		no	no	yes		
	45	Shoreline planting in pockets, west bank. North of Kinburn Sideroad	north of Kinburn Sideroad	no	no	yes		
completed	47	Increase deep rooting plants on west bank at Kinburn Community Centre		no	no	no	Planted with Kinburn Community Association and West Carleton Scouts Fall of 2014	

Appendix D - Maps for Carp River





Imagery © Aero-Photo(1961) Inc.

Coordinate System: NAD_1983_UTM_Zone_18N Projection: Transverse_Mercator Datum: North American 1983 False_Easting: 500000.0000 False_Northing: 0.0000 Central_Meridian: -75.0000 Scale_Factor: 0.9996 Latitude_Of_Origin: 0.0000 Linear Unit: Meter

1.2 0.4 0.8 Kilometers





1.6

Date: 31/03/2015



CARP HILLS WETLAND COMPLEX

Carp River Flow Enhancement Opportunities

Legend

Downed Trees





Carp River Stewardship Opportunities

Legend

197

Planting and Shoreline Rehabilitation Sites