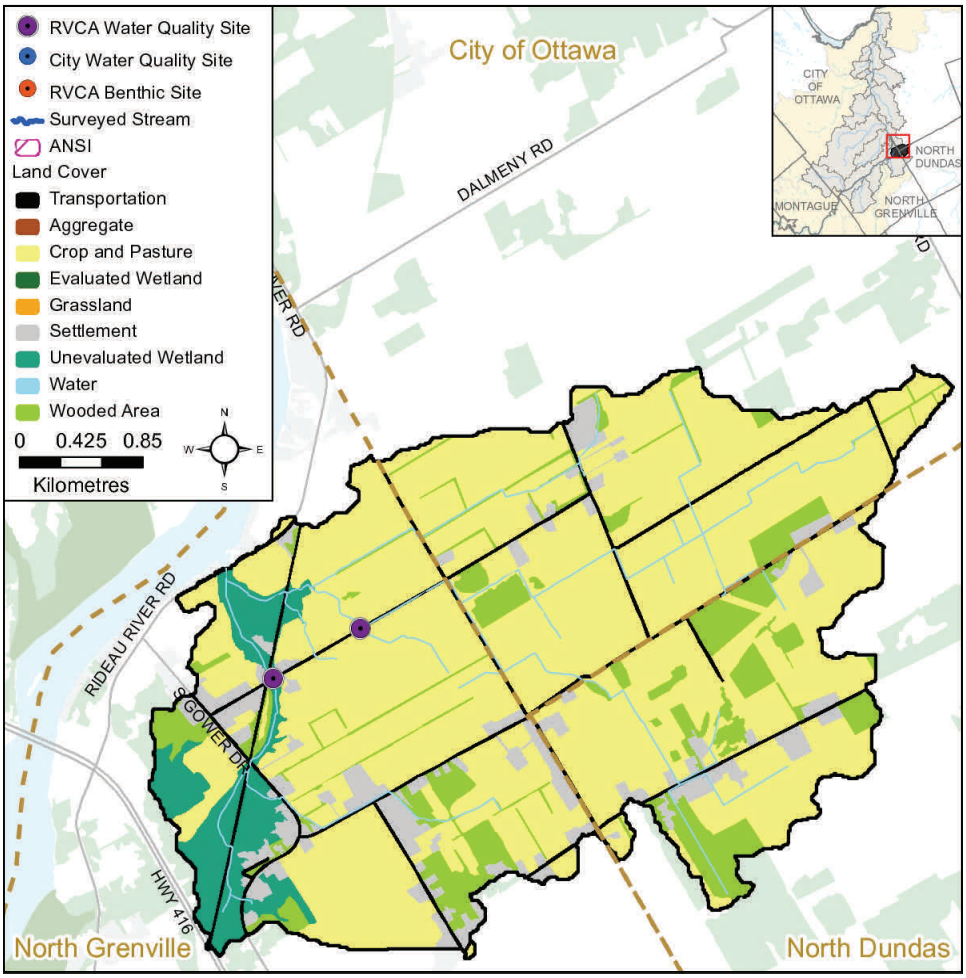
MCDERMOTT DRAIN CATCHMENT

LOWER RIDEAU RIVER SUBWATERSHED REPORT 2012

RIDEAU VALLEY CONSERVATION AUTHORITY



The RVCA produces individual reports for 16 catchments in the Lower Rideau subwatershed. Using data collected and analysed by the RVCA through its watershed monitoring and land cover classification programs, surface water quality conditions are reported for McDermott Drain along with a summary of environmental conditions for the surrounding countryside every six years.

This information is used to help better understand the effects of human activity on our water resources, allows us to better track environmental change over time and helps focus watershed management actions where they are needed the most.

The following pages of this report are a compilation of that work. For other Lower Rideau catchments and the Lower Rideau Subwatershed Report, please visit the RVCA website at www.rvca.ca.

Inside

Catchment Facts

- No artificial water level control on McDermott Drain itself, but water levels on the watercourse near its confluence with the Rideau are affected by the managed water levels of the Rideau Waterway (as controlled at the dams in Manotick and flow releases from upstream reaches of the Waterway) as well as flood levels on the Rideau (with the dams at Manotick fully opened)
- Rideau River flooding affects large acreage at north end of catchment and floodplain mapping is available along McDermott Drain from Highway 416 to its confluence with the Rideau River
- RVCA development and site alterations have been enforced within flood prone areas along the Rideau River since 1980 (Kars Bridge to Burritts Rapids)
- 45% of the catchment falls within the Municipality of North Grenville, 32% within the City of Ottawa and 23% within North Dundas Township
- Drains 14 sq. km of land or 1.9% of the Lower Rideau Subwatershed and 0.3% of the Rideau Valley Watershed
- Dominant land cover is crop and pastureland (71%), followed by woodland (11%), settlement (8%), wetland (6%) and transportation (4%)
- Riparian buffer (30 m. wide along both sides of McDermott Drain and its tributaries) is comprised of crop and pastureland (60%), wetland (15%), woodland (11%), transportation (9%) and settlement (5%)
- Contains a warm/cool water baitfish fishery with 5 fish species
- Contains five municipal drains
- Water quality rating is poor along McDermott Drain and has declined over a 12 year reporting period (2000-2005 vs. 2006-2011)
- Woodland cover has decreased by 3.3 percent (48 ha.) from 2002 to 2008
- Six stewardship (clean water) projects have been completed

1) Surface Water Quality

Assessment of streams in the Lower Rideau is based on 24 parameters including nutrients (total phosphorus, total Kjeldahl nitrogen, nitrates), E. coli, metals (like aluminum and copper) and additional chemical/physical parameters (such as alkalinity, chlorides pH and total suspended solids). Each parameter is evaluated against established guidelines to determine water quality conditions. Those parameters that frequently exceed guidelines are presented below.

The assessment of water quality throughout the Lower Rideau Subwatershed also looks at water quality targets that are presented in the 2005 Lower Rideau Watershed Strategy (LRWS), to see if they are being met. The LRWS identifies improving water quality as a priority concern; specifically reducing the levels of nutrients, bacteria and contaminants in the Lower Rideau.

1) a. McDermott Drain

Surface water quality conditions in McDermott Drain are monitored through the RVCA's Baseline Water Quality Program (MCD-03 and MCD-02 off of Gabert Road, see figure 1 for their locations).

The water quality rating for McDermott Drain ranges from "Fair" in 2000-2005 to "Poor" in 2006-2011 as determined by the CCME Water Quality Index (CCME WQI); analysis of the data has been broken into two periods 2000-2005 and 2006-2011, to examine if conditions have changed in this timeframe. Table 1 outlines the WQI scores and their corresponding ratings

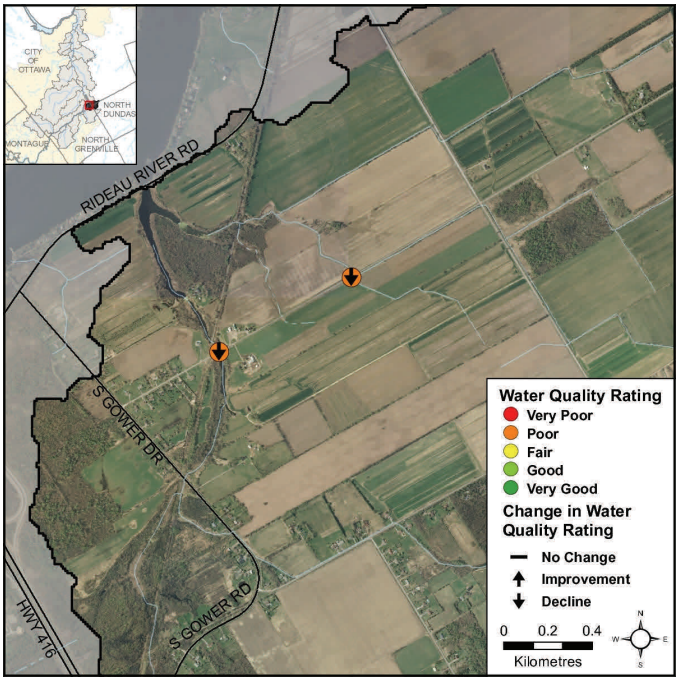


Figure 1. Sampling sites for McDermott Drain

For more information on the CCME WQI please see the Lower Rideau Subwatershed Report.

Table 1. WQI Ratings and corresponding index scores (RVCA terminology, original WQI category names in brackets).

Rating	Index Score
Very good (Excellent)	95-100
Good	80-94
Fair	65-79
Poor (Marginal)	45-64
Very poor (Poor)	0-44

McDermott Drain Nutrients

Total phosphorus (TP) is used as a primary indicator of excessive nutrient loading and may contribute to abundant aquatic vegetation growth and depleted dissolved oxygen levels. The Provincial Water Quality Objectives (PWQO) of 0.030mg/l is used as the TP Guideline. Concentrations greater than 0.030 mg/l indicate an excessive amount of TP. McDermott Drain TP results are shown in Figures 2a and 2b. In addition to the TP guideline, the LRWS Strategy set a target for TP concentration of 0.030 mg/l at the 85th percentile for tributaries of the Rideau River, such as McDermott Drain. Percentile plots of TP data are shown for two time periods 2000-2005 (Fig. 3a) and 2006-2011 (Fig. 3b). Any point to the left of the 85th percentile line (vertical) and above the guideline (horizontal line) have failed to reach the LRWS target.

Total Kjeldahl nitrogen (TKN) is used as a secondary indicator of nutrient loading; RVCA uses a guideline of 0.500 mg/l (TKN Guideline) to assess TKN concentrations. McDermott Drain TKN results are shown in Figures 4a and 4b.

Tables 2 and 3 summarize average nutrient concentrations at monitored sites on McDermott Drain and shows the proportion of samples that meet guidelines. Highlighted values indicate averages that have exceeded the guidelines

Table 2. Summary of total phosphorous results for McDermott Drain from 2000-2005 and 2006-2011

Total phosphorous 2000-2005			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.190	5	20
MCD-02	0.288	0	20
Total phosphorous 2006-2011			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.096	10	40
MCD-02	0.391	13	39

Table 3. Summary of total Kjeldahl nitrogen results for McDermott Drain from 2000-2005 and 2006-2011

Total Kjeldahl nitrogen 2000-2005			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.761	5	20
MCD-02	1.150	0	20
Total Kjeldahl nitrogen 2006-2011			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.685	8	40
MCD-02	1.750	13	39

McDermott Drain Nutrients: Site MCD-03

The majority of samples at site MCD-03 were above the TP guideline of 0.030mg/l for both time periods (figures 2a and 2b), only 5 percent of samples were below the guideline in the 2000-2005 period; this improved to ten percent of samples in the 2006-2011 period. There was also a decrease in the average TP concentration from 0.190 mg/l (Fig. 2a, 2000-2005) to 0.096 mg/l (Fig. 2b, 2006-2011). The LRWS target of a TP concentration of 0.030mg/l at the 85th percentile has not been achieved at site MCD-03, though the concentration at the 85th percentile did decrease from 0.303 mg/l (2000-2005, Fig. 3a) to 0.130 mg/l (2006-2011, Fig. 3b).

TKN is used as a secondary indicatory of nutrient enrichment. Figures 4a and 4b shows that the majority of results exceeded the TKN guideline of 0.500 mg/l; only 5 percent of samples were below the guideline in 2000-2005 and 8 percent were below the guideline in the 2006-2011 periods. The average concentration decreased slightly from 0.761 mg/l to 0.685 mg/l, far exceeding the guideline.

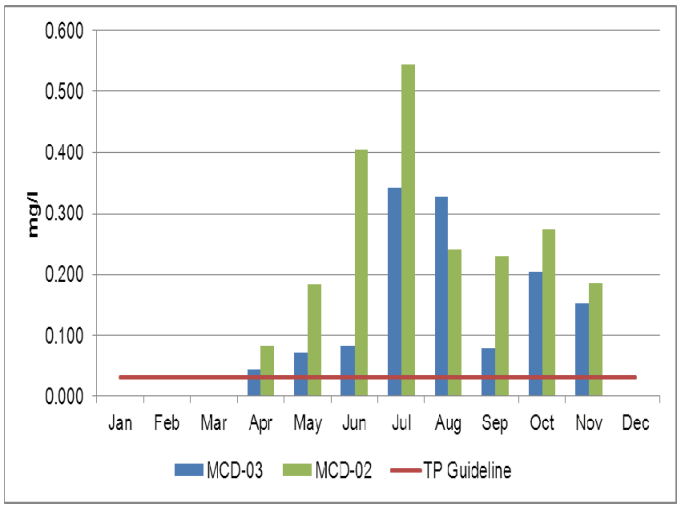


Figure 2a. Total phosphorous concentrations in McDermott Drain from 2000-2005

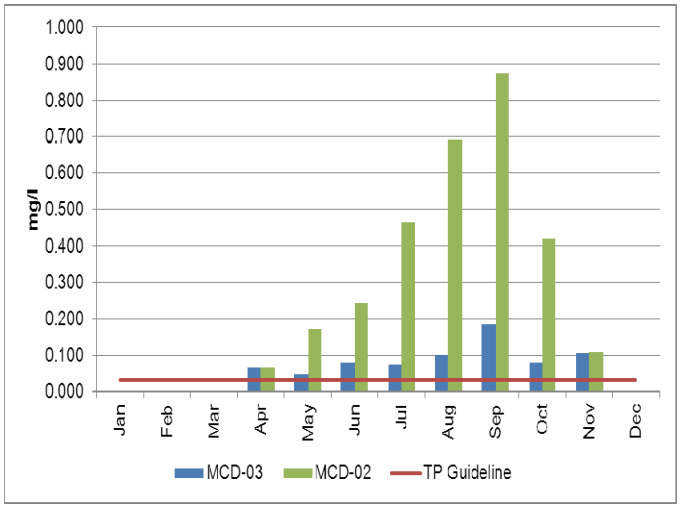


Figure 2b. Total phosphorous concentrations in McDermott Drain from 2006-2011

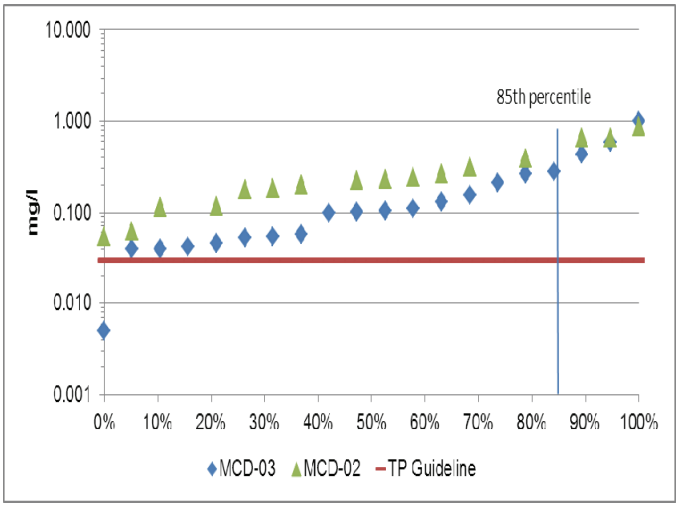


Figure 3a. Percentile plots of total phosphorous in McDermott Drain from 2000-2005

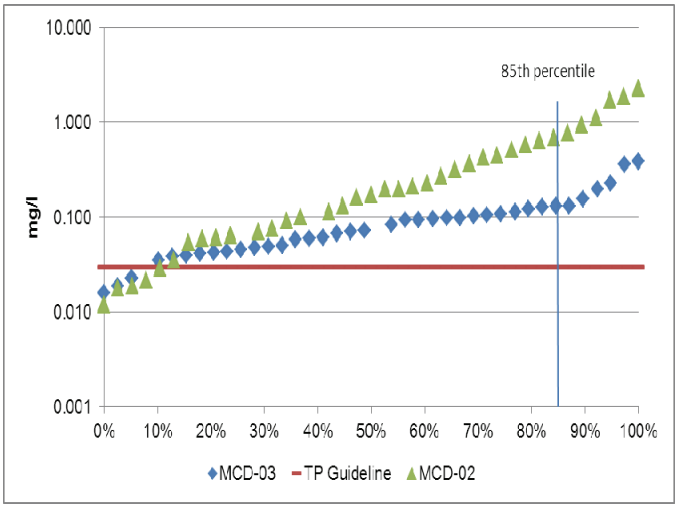


Figure 3b. Percentile plots of total phosphorous is McDermott Drain from 2006-2011

McDermott Drain Nutrients: Site MCD-02

The majority of samples at site MCD-02 were also above the TP guideline of 0.030mg/l for both time periods (Figures 2a and 2b); there were no samples below the guideline in the 2000-2005 period; this improved to thirteen percent of samples in the 2006-2011 period. Average TP concentration increased from 0.288 mg/l (Fig. 2a, 2000-2005) to 0.391 mg/l (Fig. 2b, 2006-2011). Figures 3a and 3b show that the target set by the LRWS has not been achieved for site MCD-02. The concentration at the 85th percentile increased from 0.429 mg/l (2000-2005, Fig. 3a) to 0.707 mg/l (2006-2011, Fig. 3b).

TKN results show that the majority of results exceeded the TKN guideline of 0.500 mg/l (Figure 4a and 4b), in fact there were no samples with results below the guideline. The average concentration increased from 1.150 mg/l to 1.750 mg/l, far exceeding the guideline.

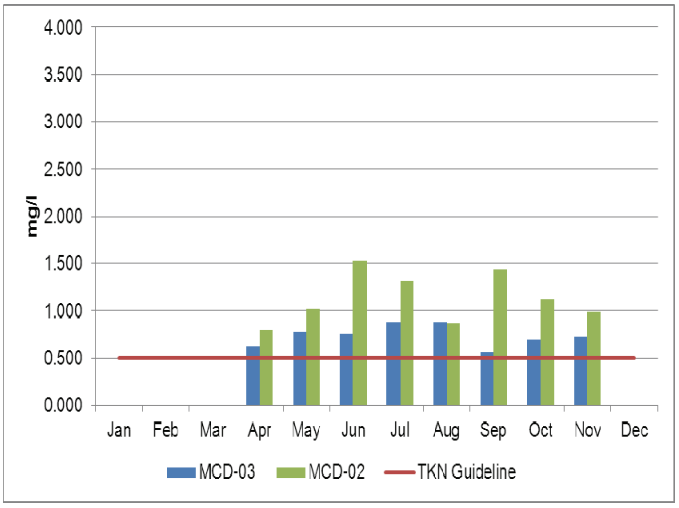


Figure 3a. Total Kjeldahl nitrogen concentrations in McDermott Drain from 2000-2005

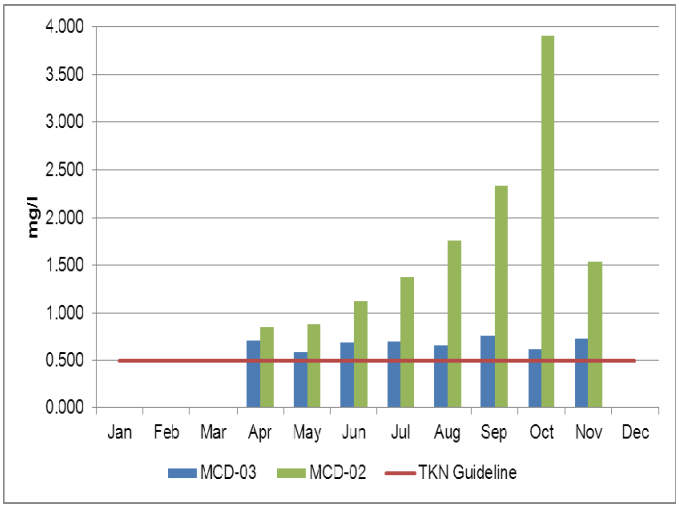


Figure 3b. Total Kjeldahl nitrogen concentrations in McDermott

McDermott Drain Nutrients Summary

Overall the data suggests that nutrient loading is a significant problem at both sites MCD-03 and MCD-02; efforts should be made to reduce nutrient inputs to the creek wherever possible to improve overall water quality.

McDermott Drain E. coli

E. coli is used as an indicator of bacterial pollution from human or animal waste; in elevated concentrations it can pose a risk to human health. The PWQO of 100 colony forming units/100 millilitres is used. E. coli counts greater than this guideline indicate that bacterial contamination may be a problem within a waterbody. The Lower Rideau Watershed Strategy also set a target for E. coli counts of 200 CFU/100 ml at the 80th percentile for tributaries of the Rideau River, such as McDermott Drain.

Table 4 summarizes the geometric mean at monitored sites on McDermott Drain and shows the proportion of samples that meet the E. coli guideline of 100 CFU/100ml. Highlighted values indicate averages that have exceeded the guideline.

Figure 5 shows the results of the geometric mean with respect to the guideline for the two periods 2000-2005 (Fig. 5a) and 2006-2011 (Fig 5b). Figures 6a and 6b show percentile plots of the data for the two time periods of interest 2000-2005 (Fig. 6a) and 2006-2011 (Fig. 6b). Any point to the left of the 80th percentile line (vertical) and above the guideline (horizontal line) have failed to reach the LRWS target

Table 4 Summary of E. coli results for McDermott Drain.

E. coli 2000-2005			
Site	Geometric mean (CFU/100ml)	% below	No. Samples
MCD-03	87	42	19
MCD-02	87	53	19
E. coli 2006-2011			
Site	Geometric mean (CFU/100ml)	% below	No. Samples
MCD-03	144	31	39
MCD-02	53	67	39

McDermott Drain E. coli: Site MCD-03

E. coli counts above the guideline of 100 colony forming units per 100 mL (CFU/100mL) were common at both water quality monitoring sites on McDermott Drain. In comparing the two time periods at site MCD-03 the proportion of samples below the guideline decreased

from forty-two percent (Fig. 5a) to thirty-one percent (Fig. 5b), indicating higher counts occur more frequently. The count at the geometric mean increased from 87 CFU/100 ml to 144 CFU/100 ml. Percentile plots of E. coli data at site MCD-03 are shown for both periods. Figures 6a and 6b show that this target was exceeded in both time periods, the E. coli count at the 80th percentile increased from 222 CFU/100 ml to 644 CFU/100 ml.

McDermott Drain E. coli: Site MCD-02

A second water quality monitoring site, MCD-02 is located downstream of MCD-03. The proportion of samples below the guideline at MCD-02 increased slightly from fifty-three percent (Fig. 5a) to sixty-seven percent (Fig. 5b). The count at the geometric mean decreased from 87 CFU/100 ml to 53 CFU/100 ml. Figures 6a and 6b show that the LRWS target for E. coli was exceeded in both time periods; though the E. coli count at the 80th percentile did decrease from 298 CFU/100 ml to 210 CFU/100 ml.

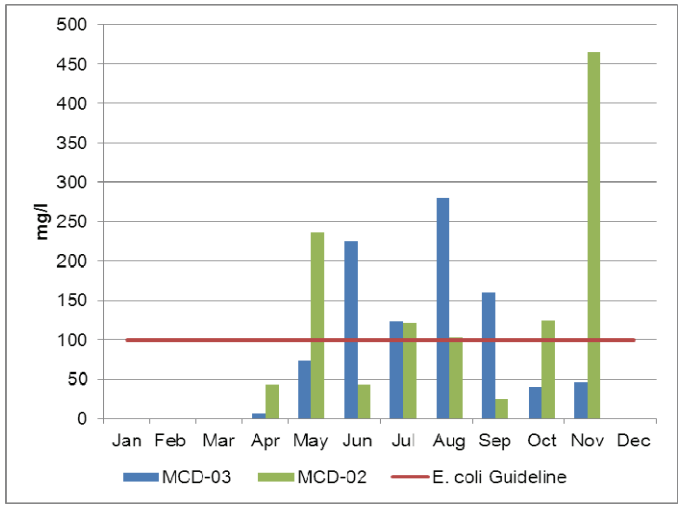


Figure 5a. E. coli counts in McDermott Drain from 2000-2005

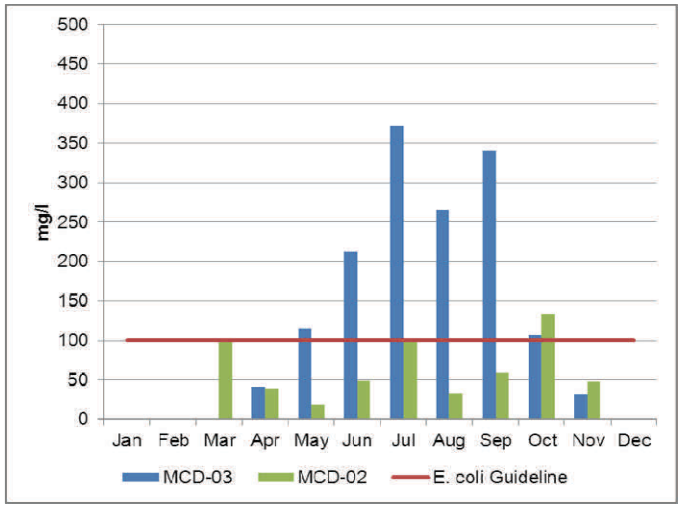


Figure 5b. E. coli counts in McDermott Drain from 2006-2011

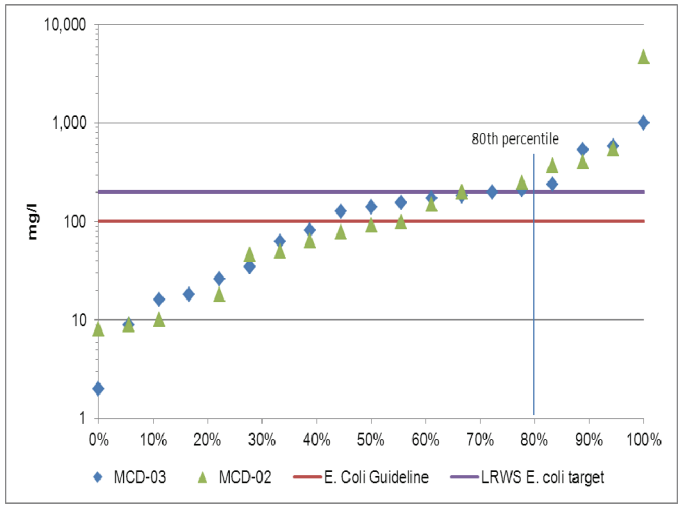


Figure 6a. Percentile plots of E. coli in McDermott Drain from 2000-2005

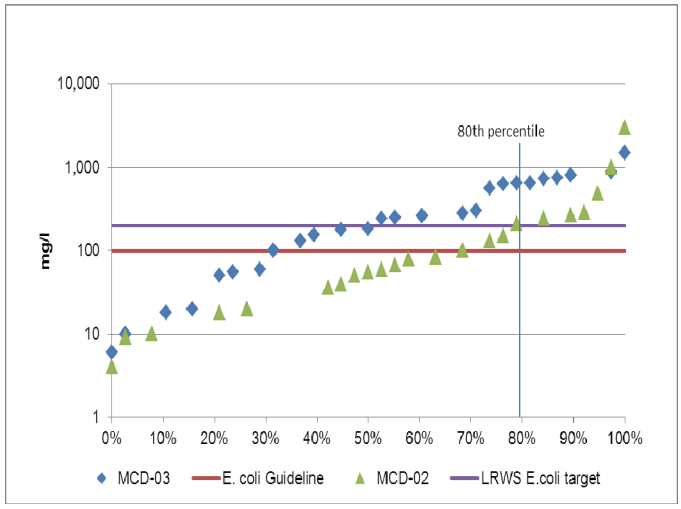


Figure 6b. Percentile plots of E. coli in McDermott Drain from 2006-2011

McDermott Drain E. coli Summary

These statistics indicated that bacterial counts have increased at site MCD-03 and efforts should be made to reduce any possible sources of contamination to the creek to improve overall water quality.

Bacterial counts have decreased at site MCD-02, efforts should be continued to reduce any additional sources of contamination to the creek to protect overall water quality and aquatic life.

McDermott Drain Metals

Of the metals routinely monitored in McDermott Drain, aluminum (Al), copper (Cu) and iron (Fe) were metals that reported concentrations above their respective PWQO. In elevated concentrations these metals can have toxic effects on sensitive aquatic species.

Table 5 summarizes average metal concentrations at monitored sites on McDermott Drain and shows the proportion of samples that meet guidelines. Highlighted values indicate averages that have exceeded the guidelines.

Figures 7, 8 and 9, show the results for each site with respect to guidelines for the two periods 2000-2005 (Figures 7a, 8a and 9a) and 2006-2011 (Figures 7b, 8b and 9b). The guidelines for each metal as stated by the PWQO are Al 0.075 mg/l, Cu 0.005 mg/l and Fe 0.300 mg/l. The Lower Rideau Watershed Strategy (2005) also set a target for Cu concentration of 0.005 mg/l at the 80th percentile. Figure 10 shows percentile plots of the data for the two time periods of interest (Fig. 10a, 2000-2005) (Fig. 10b, 2006-2011). Any point to the left of the 80th percentile line (vertical) and above the guideline (horizontal line) have failed to reach the LRWS target.

Table 5. Summary of metal results for McDermott Drain.

Aluminum (Al)			
2000-2005			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.142	30	20
MCD-02	0.104	81	21
2006-2011			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.210	28	18
MCD-02	0.066	83	18
Iron (Fe)			
2000-2005			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.272	70	20
MCD-02	0.478	57	21
2006-2011			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.402	61	18
MCD-02	0.559	53	17
Copper (Cu)			
2000-2005			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.004	80	20
MCD-02	0.003	86	21
2006-2011			
Site	Average (mg/l)	% below	No. Samples
MCD-03	0.004	72	18
MCD-02	0.003	83	18

McDermott Drain Metals: Site MCD-03

The majority of metals monitored at site MCD-03 were below guidelines, however results for aluminum (Al), iron (Fe) and copper (Cu) were occasionally elevated.

The Al guideline of 0.075 mg/l was generally exceeded in both time periods (Figures 7a and 7b), only thirty percent of samples were below the guideline in the 2000-2005 period remained fairly consistent at twenty-eight percent in the 2006-2011 period. There was a slight increase in average Al concentration from 0.142 mg/l (2000-2005) to 0.210 mg/l (2006-2011).

Figures 8a and 8b show that the Fe results often exceed the guideline of 0.300 mg/l and there was an overall increase in concentrations over the periods of interest. Seventy percent of samples were below the guideline in 2000-2005 and decreased to sixty one percent in the

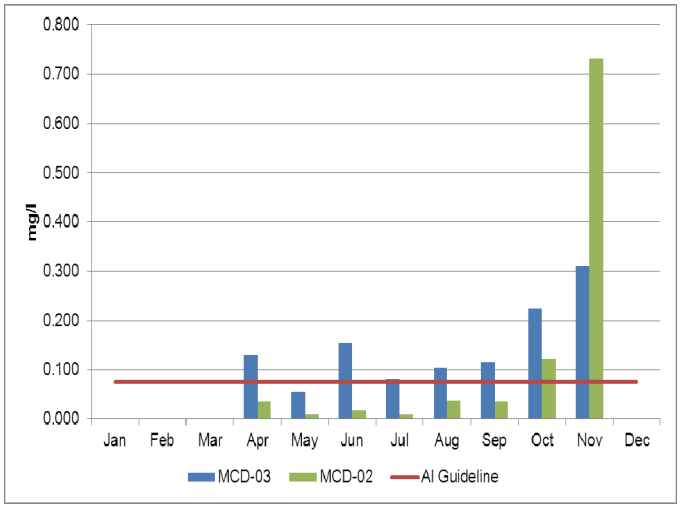


Figure 7a. Aluminum concentrations in McDermott Drain from 2000-2005

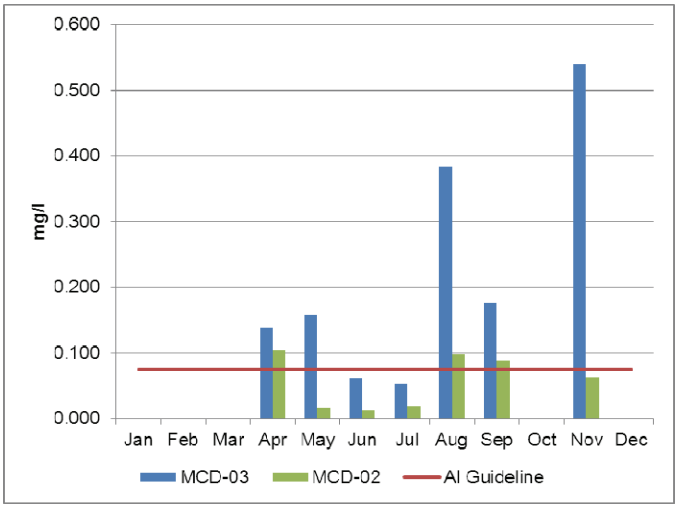


Figure 7b. Aluminum concentrations in McDermott Drain from 2006-2011

2006-2011 period. The average concentration increased from 0.272 mg/l to 0.402 mg/l, exceeding the guideline.

Results for Cu concentrations were also occasionally above the guideline of 0.005 mg/l. The proportion of samples below the guideline decreased slightly from eighty percent (Fig. 9a, 2000-2005) to seventy-two percent (Fig. 9b, 2006-2011); the average concentration remained constant at 0.004 mg/l .Percentile plots of Cu data are shown for the two time periods 2000-2005 (Fig. 10a) and 2006-2011 (Fig. 10b). The target of a Cu concentration of 0.005 mg/l at the 80th percentile has not been achieved at site MCD-03, the concentration at the 80th percentile increased from 0.005 mg/l (2000-2005, Fig. 10a) to 0.006 mg/l (2006-2011, Fig 10b).

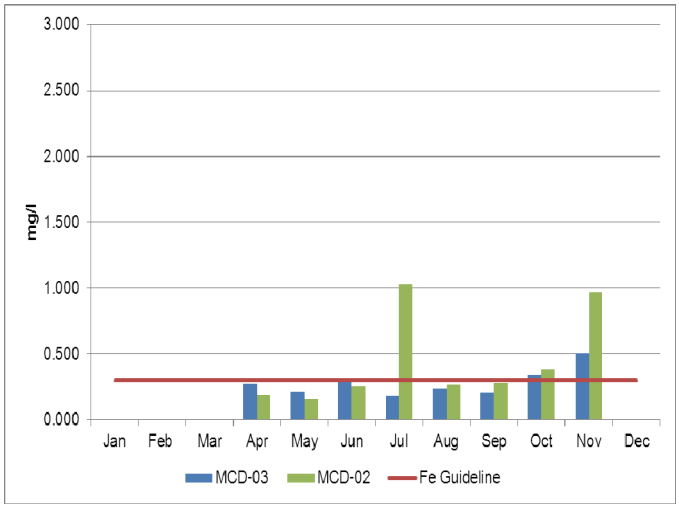


Figure 8a. Iron concentrations in McDermott Drain from 2000-2005

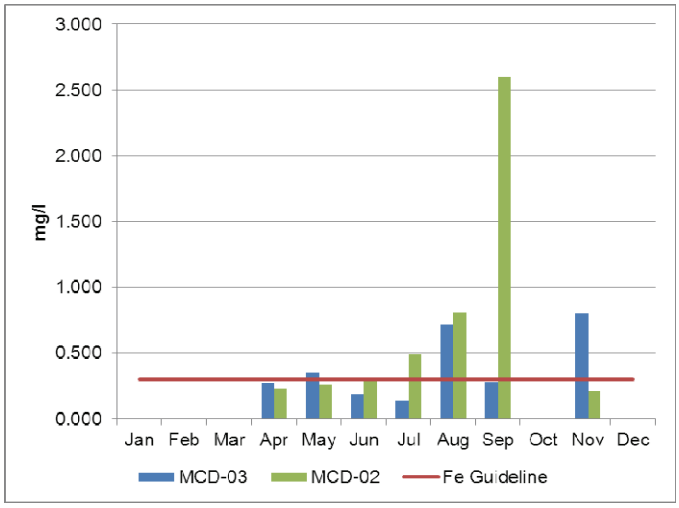


Figure 8b. Iron concentrations in McDermott Drain from 2006-2011

McDermott Drain Metals: Site MCD-02

Results for Al were generally below the guideline at MCD-02, eighty-one percent of samples were below the guideline in the 2000-2005 period (Fig. 7a) and remained fairly consistent at eighty-three percent in the 2006-2011 period (Fig. 7b). There was a decrease in the average Al concentration from 0.104 mg/l (2000-2005) to 0.066 mg/l (2006-2011).

Figures 8a and 8b show that the Fe results often exceed the guideline of 0.300 mg/l and there was an overall increase in concentrations over the periods of interest. Fifty-seven percent of samples were below the guideline in 2000-2005 (Fig. 8a) and decreased slightly to fifty-three percent in the 2006-2011 period (Fig 8b). The average concentration increased from 0.478 mg/l to 0.559 mg/l, exceeding the guideline.

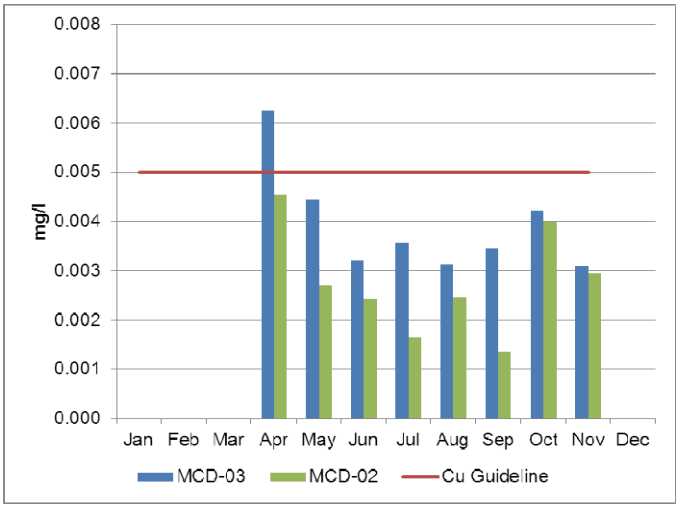


Figure 9a. Copper concentrations in McDermott Drain from 2000-2005

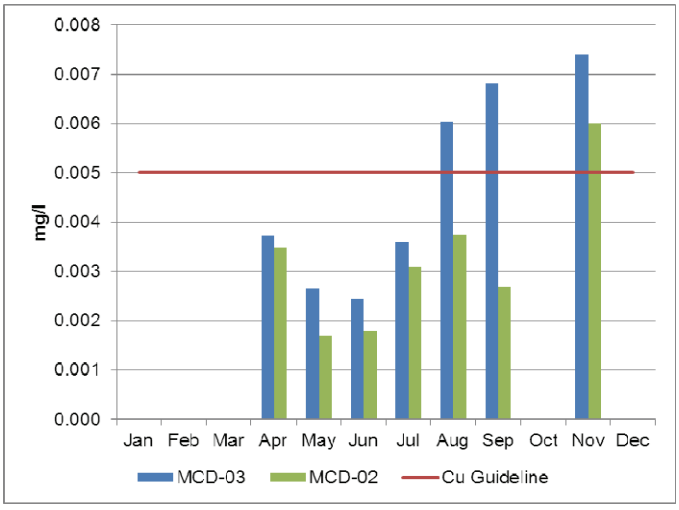


Figure 9b. Copper concentrations in McDermott Drain from 2006-2011

Results for Cu concentrations were also occasionally above the guideline of 0.005 mg/l. The proportion of samples below the guideline decreased slightly from eighty-six percent (Fig. 9a, 2000-2005) to eighty-three percent (Fig 9b, 2006-2011), the average concentration remained constant at 0.003 mg/l .Percentile plots of Cu data are shown for the two time periods 2000-2005 (Fig. 10a) and 2006-2011 (Fig. 10b). The target of a Cu concentration of 0.005 mg/l at the 80th percentile was achieved at site MCD-02, the concentration at the 80th percentile decreased from 0.004 mg/l (2000-2005, Fig. 10a) to 0.001 mg/l (2006-2011, Fig. 10b).

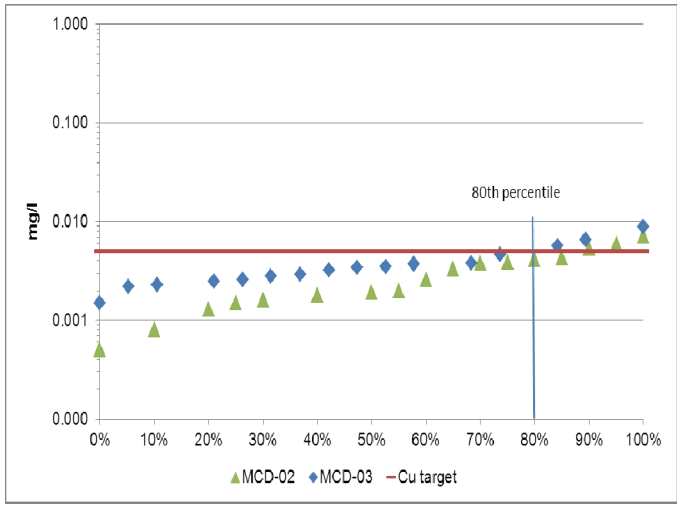


Figure 10a. Percentile plots of copper in McDermott Drain from 2000-2005

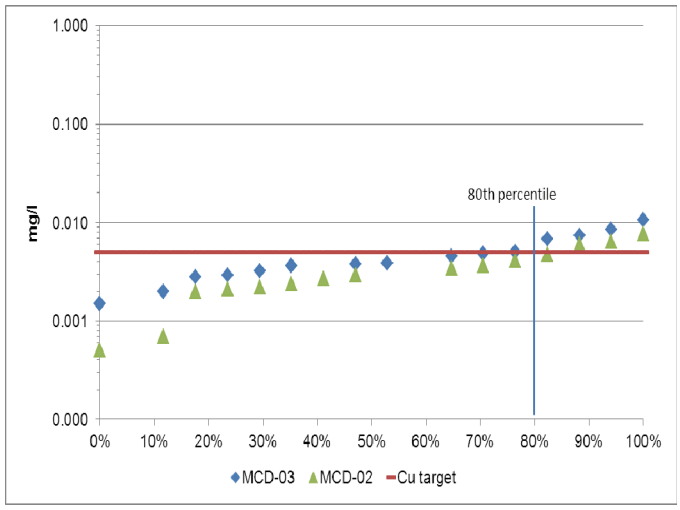


Figure 10b. Percentile plots of copper in McDermott Drain from 2006-2011

McDermott Drain Metals Summary

Overall the data shows that metal pollution at site MCD-03 is a problem in the creek and efforts should be made to reduce concentrations wherever possible.

Overall the data indicates that metal pollution occasionally occurs at site MCD-02 and efforts should be made to reduce sources where possible.

McDermott Drain Total Suspended Solids

Total suspended solids (TSS) are monitored to determine the amount of sediment in the watercourse. Increased sediment can result in higher nutrient concentrations as these particles bring nutrient rich soil or metals into the waterbody and can also negatively impact instream aquatic species.

Table 6 summarizes average TSS concentrations at monitored sites on McDermott Drain and shows the proportion of samples that meet the TSS Guideline of 25mg/l. Highlighted values indicate averages that have exceeded the guideline.

Total suspended solids (TSS) are assessed from the change in background conditions rather than a static guideline. The guideline used is that this change should be less than 25 mg/l. McDermott Drain TSS results are shown in Figures 11a, 2000-2005 and 11b, 2006-2011.

Table 6. Summary of total suspended solids in McDermott Drain

Total Suspended Solids (TSS)		
2000-2005		
Site	Average (mg/l)	No. Samples
MCD-03	9.9	20
MCD-02	6.8	20
2006-2011		
Site	Average (mg/l)	No. Samples
MCD-03	29.3	40
MCD-02	63.1	39

McDermott Drain Total Suspended Solids: Site MCD-03

Figures 11a and 11b show monthly TSS concentrations at site MCD-03; the data indicates that high TSS levels were more prevalent in 2006-2011, compared to 2000-2005. The average TSS concentrations increased from 9.9 mg/l (2000-2005) to 29.3 (2006-2011), this is an increase of 19.4 mg/l, therefore concentrations remained below the guideline at this site.

McDermott Drain Total Suspended Solids: Site MCD-02

The data indicates that high TSS levels were greater in 2006-2011, compared to 2000-2005. The average TSS concentrations increased from 6.8 mg/l (Fig. 11a, 2000-2005) to 63.1 (Fig. 11b, 2006-2011); this is an increase of 56.3 mg/l, therefore concentrations exceeded the guideline and effort should be made to reduce any sources of sediment loading to the creek.

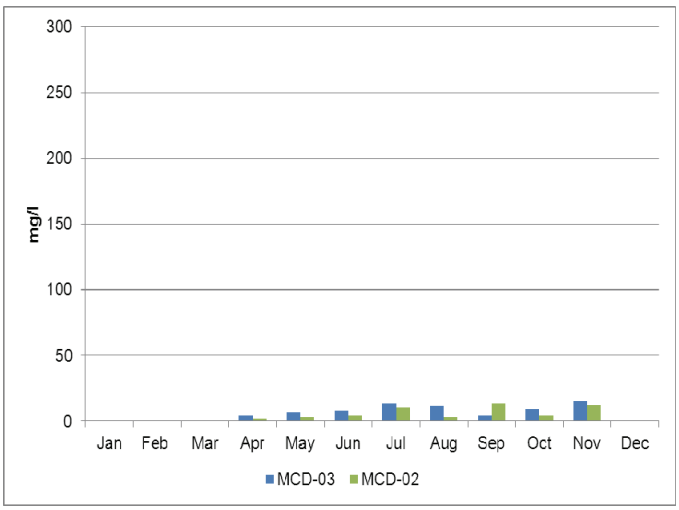


Figure 11a. Total suspended solids concentrations in McDermott Drain from 2000-2005

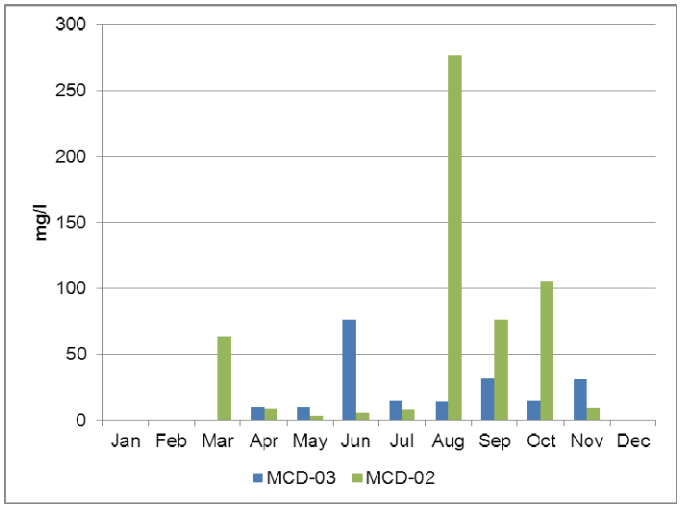


Figure 11b. Total suspended solids concentration in McDermott Drain from 2006-2011

Image of a site on McDermott Drain

Cardinal Flower

Image of a white water lily

A staff member using a YSI to collect water quality data

2) a. Overbank Zone

Riparian Buffer along McDermott Drain and Tributaries

The riparian or shoreline zone is that special area where the land meets the water. Well-vegetated shorelines are critically important in protecting water quality and creating healthy aquatic habitats, lakes and rivers. Natural shorelines intercept sediments and contaminants that could impact water quality conditions and harm fish habitat in streams. Well established buffers protect the banks against erosion, improve habitat for fish by shading and cooling the water and provide protection for birds and other wildlife that feed and rear young near water. A recommended target (from Environment Canada's Guideline: How Much Habitat is Enough?) is to maintain a minimum 30 metre wide vegetated buffer along at least 75 percent of the length of both sides of rivers, creeks and streams.

Figure 12 shows the extent of the naturally vegetated riparian zone in the catchment, 30 metres on either side of all waterbodies and watercourses. Results from the RVCA's Land Cover Classification Program show that 26 percent of streams and creeks are buffered with woodland and wetland; the remaining 74 percent of the riparian buffer is occupied by settlement, crop and pastureland and transportation

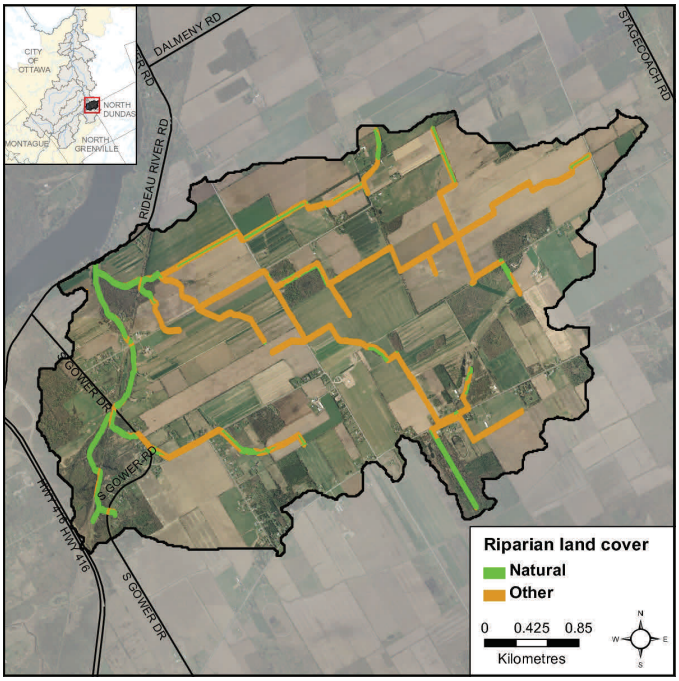


Figure 12. Catchment land cover in the riparian zone

Fish Sampling

Fish sampling sites located along McDermott Drain are shown in Figure 13. The provincial fish codes shown on the following map are listed (in Table 7) beside the common name of those fish species identified in McDermott Drain (Data source: RVCA and City of Ottawa).

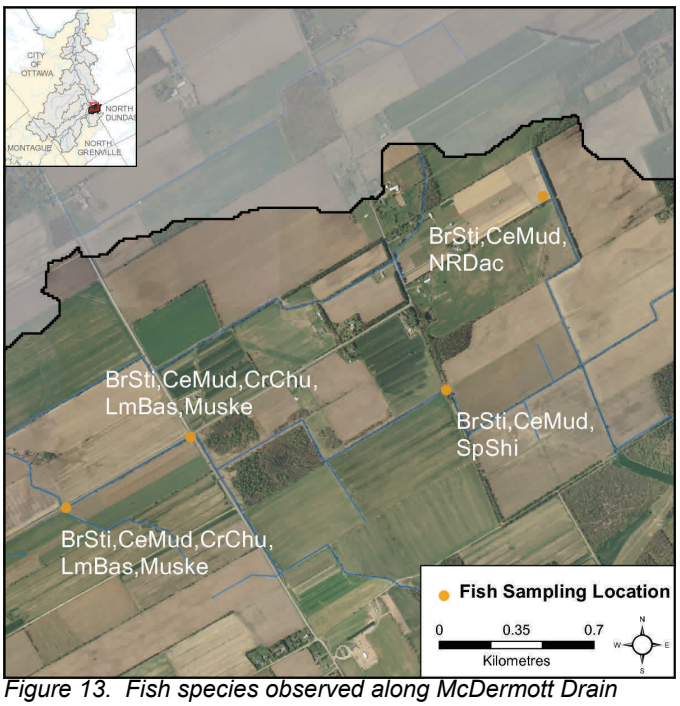


Figure 13. Fish species observed along McDermott Drain

Table 7. Fish species observed in McDermott Drain

BrSti **brook stickleback**	CeMud **central mudminnow**	CrChu **creek chub**	LmBas **largemouth bass**
Muske **muskellunge**	NRDace **northern redbelly dace**	SpShi **spottail shiner**	

3) ***Land Cover***

Crop and pastureland is the dominant land cover type in the catchment as shown in Table 8 and displayed in the land cover map on the front cover of the report.

Table 8. Catchment land cover type

Cover Type	Area (ha)	Area (% of Cover)
Crop & Pasture	1024	71
Woodland	161	11
Settlement	116	8
Wetland	85	6
Transportation	58	4

Woodland Cover

The McDermott Drain catchment contains 161 hectares of woodland (Fig.14) that occupies 11 percent of the drainage area. This figure is less than the 30 percent of woodland area required to sustain forest birds, according to Environment Canada's Guideline: "How much habitat is enough?" When forest cover declines below 30 percent, forest birds tend to disappear as breeders across the landscape.

Twenty (40%) of the 50 woodland patches in the catchment are very small, being less than one hectare in size. Another 28 (56%) of the wooded patches ranging from one to less than 20 hectares in size tend to be dominated by edge-tolerant bird species. The remaining two (4% of) woodland patches (at 22 and 28 ha. respectively) contain woodland between 20 and 100 hectares and may support a few area-sensitive species and some edge intolerant species, but will be dominated by edge tolerant species.

No patch tops 200 hectares, which according to the Environment Canada Guideline will support 80 percent of edge-intolerant forest bird species (including most area sensitive species) that prefer interior forest habitat conditions.

Forest Interior

The same 50 woodlands contain 11 forest interior patches (Fig.14) that occupy less than one percent (5 ha.) of the catchment land area. This is below the ten percent figure referred to in the Environment Canada Guideline that is considered to be the minimum threshold for supporting edge intolerant bird species and other forest dwelling species in the landscape.

All patches (11) have less than 10 hectares of interior forest, eight of which have small areas of interior forest habitat less than one hectare in size.

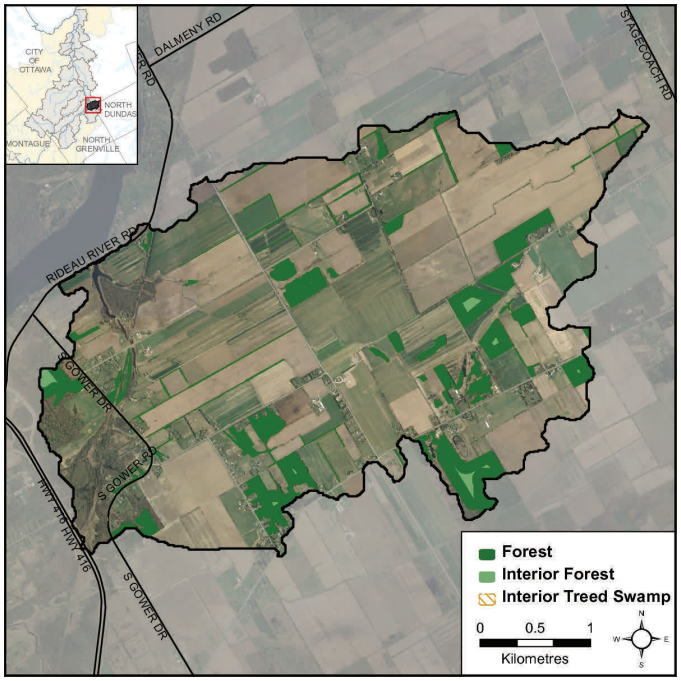


Figure 14. Catchment woodland cover and forest interior

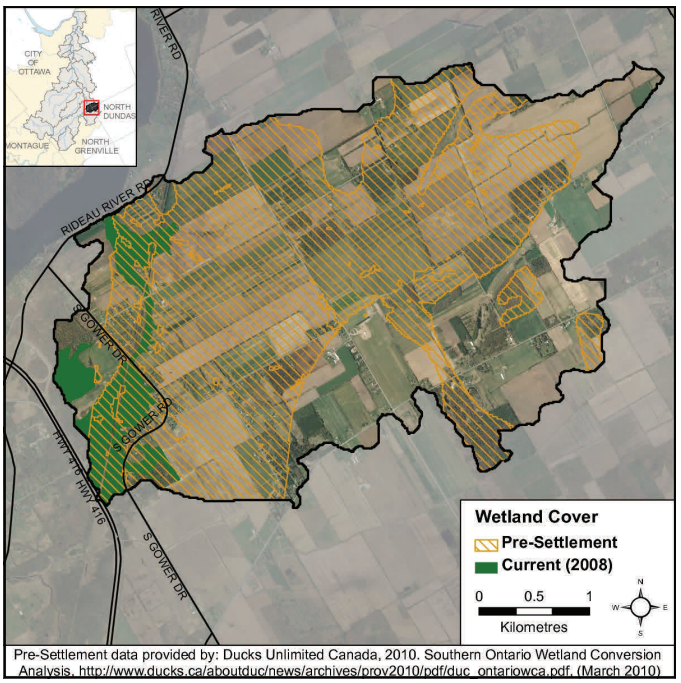


Figure 15. Pre-settlement and present day wetland cover

4) Stewardship and Protection

The RVCA and its partners are working to protect and enhance environmental conditions in the Lower Rideau River Subwatershed.

Rural Clean Water Projects

Figure 16 shows the location of all Rural Clean Water Projects in the McDermott Drain area. From 2006 to 2011, landowners completed 5 projects including 3 septic system repair/replacements and 2 well upgrades. In total, RVCA contributed $6,000 in grant dollars to projects valued at $25,770.

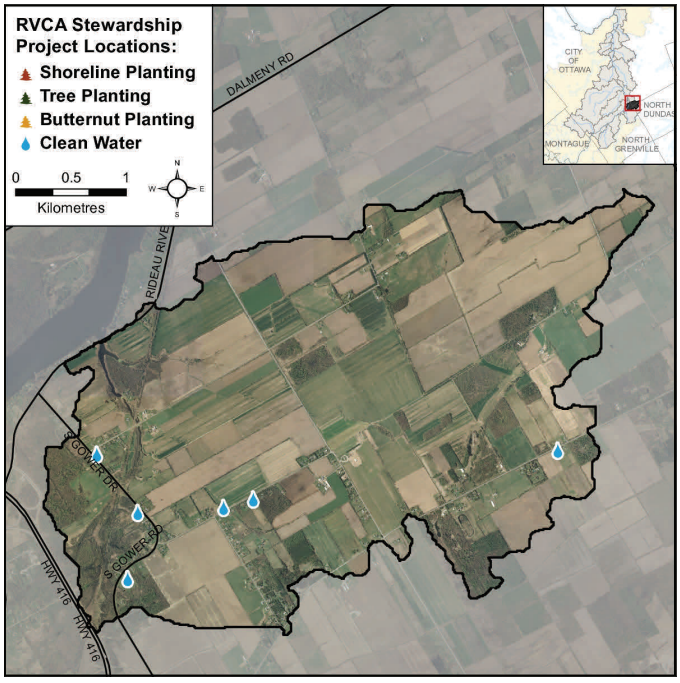


Figure 16. RVCA stewardship program project locations

Prior to 2006, the RVCA completed 1 well upgrade project. In total, RVCA contributed $367 in grant dollars to projects valued at $734.

Tree Planting Projects

No RVCA tree planting projects have been completed in the McDermott Drain catchment area.

Valley, Stream, Wetland and Hazard Land Regulation

Three square kilometres or 19 percent of the catchment drainage area is within the regulation limit of Ontario Regulation 174/06 (Fig.17), giving protection to wetland areas and river or stream valleys that are affected by flooding and erosion hazards.

Natural features within the regulation limit include 6.7 kilometres of streams (representing 29 percent of all streams in the catchment).

Plotting of the regulation limit on the remaining 16.4 km (or 71 percent) of streams requires identification of flood and erosion hazards and valley systems.

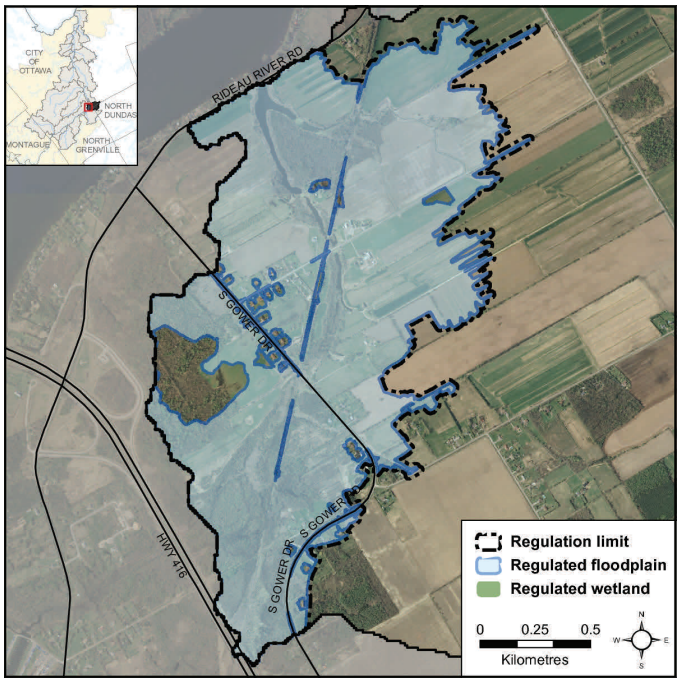


Figure 17. RVCA regulation limit

Within the regulation limit, “development” and “site alteration” require RVCA permission, as do any proposed works to alter a watercourse, which are subject to the “alteration to waterways” provision of Ontario Regulation 174/06.

5) Issues

- Removal of natural vegetation along watercourses
- Nutrient, E.coli and metal exceedances observed in water samples taken
- Altered hydrology from drainage practices causing in-stream erosion and impacts to aquatic habitat
- Reduced biodiversity
- Loss of wetland and forest habitat
- Erosion or slope stability have not been assessed
- Rideau River flooding affects large acreage at north end of catchment near confluence with Rideau
- Nutrient, E.coli, metal and TSS exceedances observed in water samples taken

6) Opportunities for Action

- Work with landowners to implement agricultural best management practices and pursue improvements to the riparian corridor along McDermott Drain and tributaries (by increasing buffers through reforestation/riparian plantings and invasive species removal)
- Target riparian and instream restoration at sites identified in this report (as shown in Figures 29, 30 and 34) and explore other restoration and enhancement opportunities along the McDermott Drain riparian corridor
- Add an Ontario Benthos Biomonitoring Network site to monitor stream health from a biological perspective