



# LOWER RIDEAU Subwatershed Report 2012

A report on the  
environmental  
condition of the  
Lower Rideau River



# Welcome to the Lower Rideau Subwatershed



**A** watershed is an area of land that drains to a river, lake or stream. In the larger Rideau watershed, there are six major subwatersheds: Jock River, Kemptville Creek, Lower Rideau, Middle Rideau, Rideau Lakes and Tay River.

This report looks at one subwatershed – the Lower Rideau which

is the final subwatershed through which the Rideau flows. The City of Ottawa occupies the confluence of the Rideau River and the Ottawa River. Consequently, the Lower Rideau is the most densely-populated and urban of all the Rideau subwatersheds. It shows the full array of transportation, housing, hard surfaces and land uses — all of which put pressures on our local streams.

Starting at Burritts Rapids (and the junction with the Middle Rideau subwatershed), the Lower Rideau flows gently through the farming communities in North Grenville and the former Osgoode and Rideau Townships, past the burgeoning suburbs of Manotick, Barrhaven, and Riverside South before splitting from the Rideau Canal at Hogs Back. With the force of the Hogs Back Falls behind it, the river pushes through the heart of the city and over the Rideau Falls to the Ottawa River and eventually the St. Lawrence and the Atlantic Ocean.

## What We Monitor and Why?

The Rideau Valley Conservation Authority (RVCA) goal is for clean water, healthy shorelines and sustainable land use. Monitoring helps us see trends over time, focus resource management actions where they can do the most good and evaluate the effectiveness of watershed management policies and programs.

This report, together with more detailed catchment reports prepared for each of the 16 catchments of the Lower Rideau (available at [www.rvca.ca](http://www.rvca.ca)), is a snapshot of 2011 conditions, using four key indicators of watershed health: water quality, forest cover, riparian cover and wetlands. Previous data on water quality and forest cover is used, where applicable, for comparison with current conditions.

### Lower Rideau Subwatershed

**Drainage Area**  
765 square kilometres

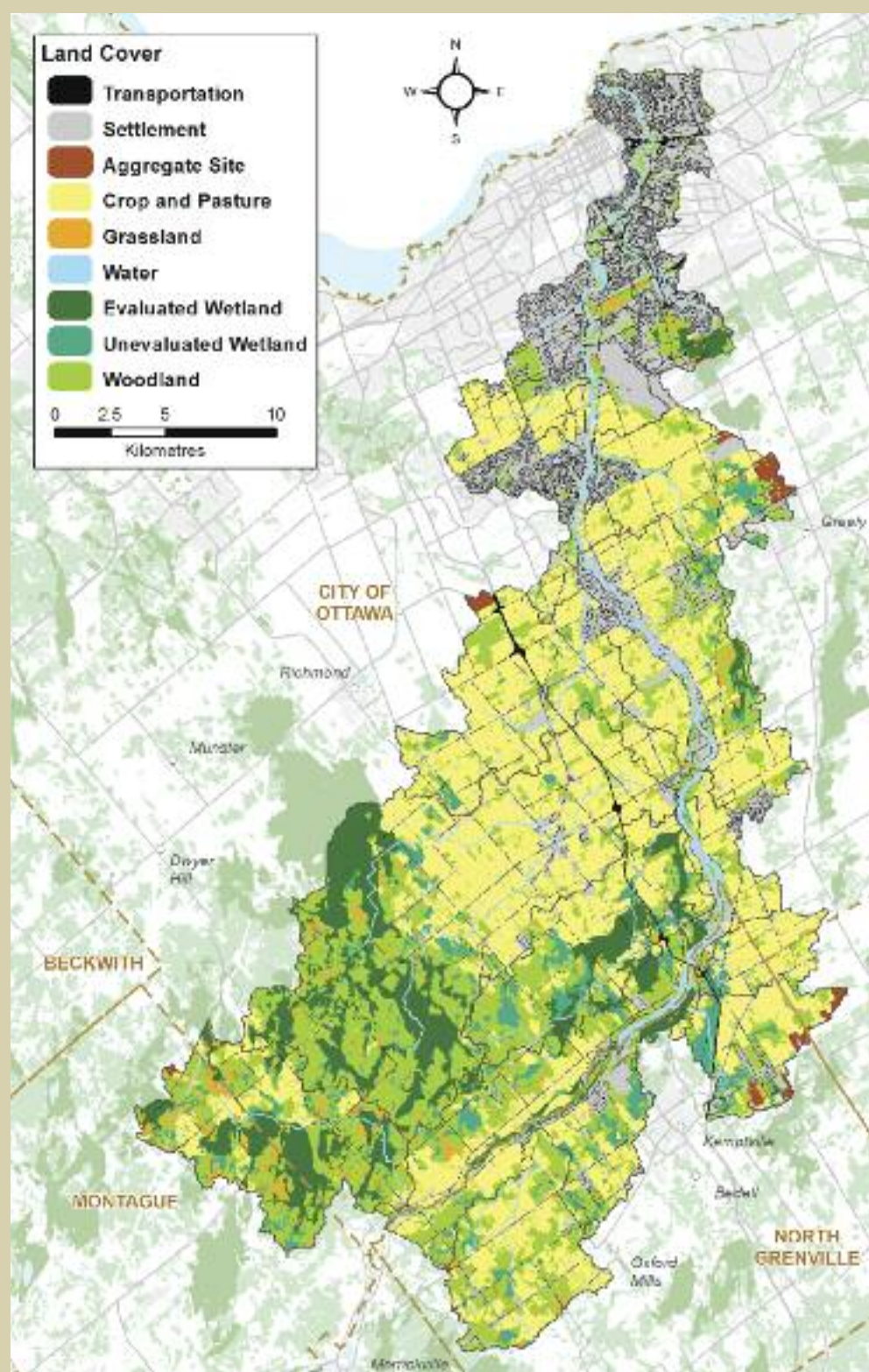
**Length of River**  
70.6 kilometres

**Length of tributary streams/creeks:**  
1,149 kilometres

#### Catchment areas

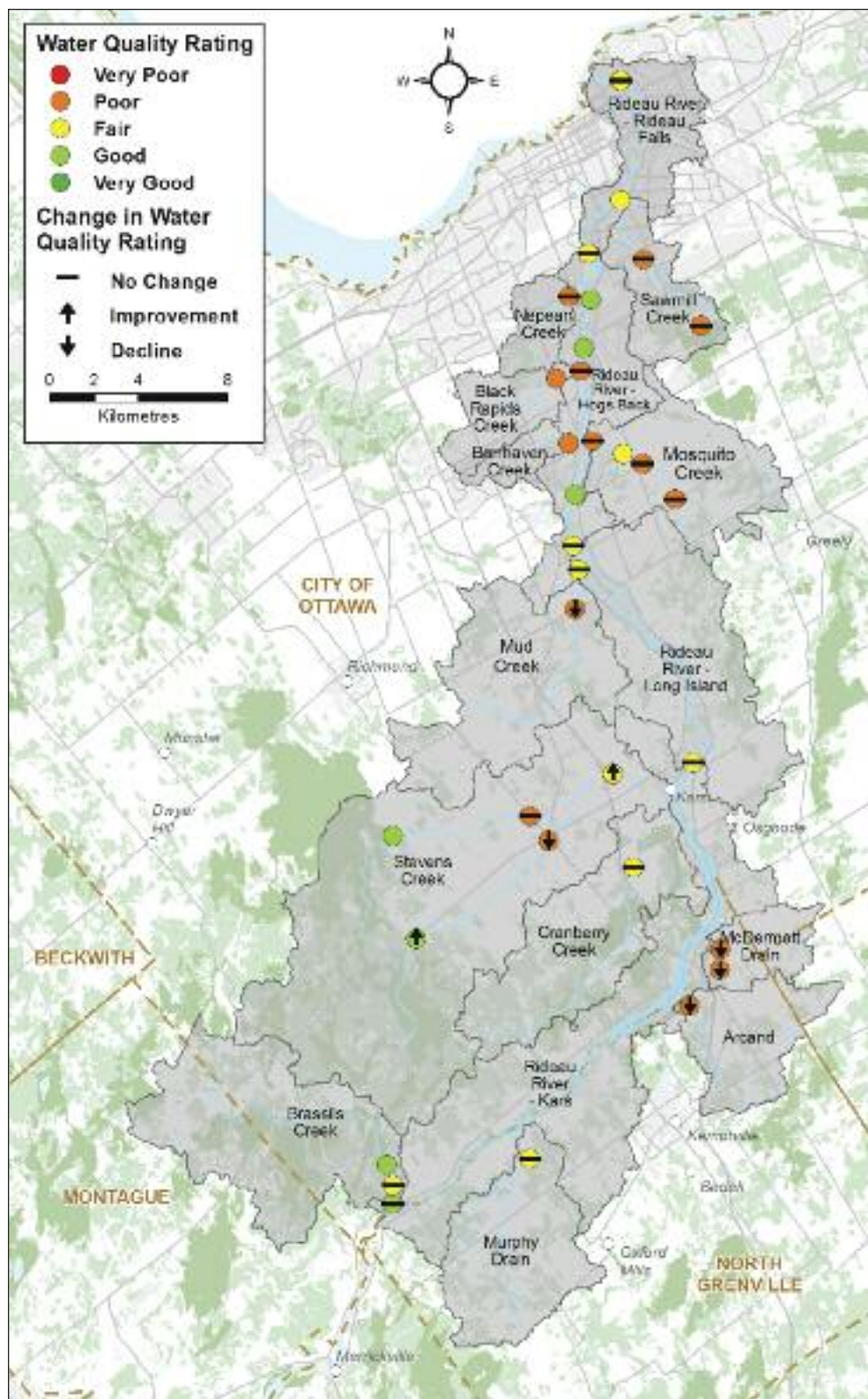
- Arcand Drain  
27.0 km<sup>2</sup>
- Barrhaven Creek  
7.0 km<sup>2</sup>
- Black Rapids Creek  
16.7 km<sup>2</sup>
- Brassils Creek  
67.5 km<sup>2</sup>
- Cranberry Creek  
52.0 km<sup>2</sup>
- McDermott Drain  
14.4 km<sup>2</sup>
- Mosquito Creek  
41.1 km<sup>2</sup>
- Mud Creek  
57.6 km<sup>2</sup>
- Murphy Drain  
43.1 km<sup>2</sup>
- Nepean Creek  
10.7 km<sup>2</sup>
- Rideau River – Hogs Back  
37.5 km<sup>2</sup>
- Rideau River – Kars  
108.8 km<sup>2</sup>
- Rideau River – Long Island  
66.7 km<sup>2</sup>
- Rideau River – Rideau Falls  
28.4 km<sup>2</sup>
- Sawmill Creek  
20.7 km<sup>2</sup>
- Stevens Creek  
165.5 km<sup>2</sup>







# Water Quality





# Water Quality

## How is water quality measured?

Our water quality ratings are made up of many water quality parameters blended together to allow water quality to be communicated by a single rating of “very poor, poor, fair, good or very good.” This is based on the Canadian Council of Ministers of the Environment Water Quality Index (CCME WQI). Ratings are based on how often, how many and by how much sample results for each parameter exceed established water quality guidelines.

## What is measured?

The final water quality rating is based on analysis of 24 of the following parameters from many water samples taken at the same point along the Lower Rideau River and its tributaries over a six to 12 year period.

- Nutrients (total phosphorus, total Kjeldahl nitrogen and nitrate); excessive nutrients may result in excessive vegetation and reduced dissolved oxygen available for the aquatic community
- *E. coli* as an indicator of the presence of bacteria originating from human or animal waste
- Metals (including lead, iron and copper) which may pose a health risk to aquatic life and indicate the presence of pollution
- Additional chemical/physical parameters (such as pH, alkalinity and total suspended solids) which may indicate stresses to aquatic life and stream function

The change in the water quality rating over time arrows on the map compare Water Quality Index values for the period from 2006 to 2011 with values from the 2000 to 2005 period.



1. Water quality sampling on Sawmill Creek 2. Water quality sampling on Stevens Creek



# Water Quality

## Water Quality in the Lower Rideau Subwatershed

Water quality at the 33 sampling sites in the Lower Rideau Subwatershed ranges from good to poor depending on the specific location and adjacent land uses. This water quality snapshot shows that efforts and investments that have been made to protect water quality as urban development occurs are achieving a “no further degradation” objective, but more work is needed to achieve the ultimate goal of improving water quality ratings from poor to fair or from fair to good. The majority of the 33 monitoring sites are showing the same or improved water quality since 2005. Only five show deteriorating water quality conditions.

Water quality ratings on the Rideau itself are generally better than ratings on the tributaries due to the diluting effect of flow from upstream.

The sites where water quality has been downgraded typically show persistently elevated levels of nutrients (nitrogen and phosphorus) often associated with high concentrations of *E. coli* and metals (aluminum, copper and iron in particular).

Each site monitored is unique. To understand any changes in water quality we need to look at individual sampling results. In the majority of cases, water quality will only be improved by reducing nutrient sources through the implementation of best management practices and protection of natural areas.

There is obviously work to be done. As you will see, forest cover, riparian cover and wetlands — the three great protectors of water quality — are declining in several areas of the subwatershed.



1. Hogs Back Falls 2. Rideau River facing south, Rideau River Road — near Kemptville 3. Barrhaven Creek



Settlement areas will likely increase. The poor water quality ratings are in predominantly agricultural catchments showing us where water quality restoration efforts should be focused. The ratings in the more recently-urbanized portions of the subwatershed (north of Manotick) are unchanged, possibly indicating that stormwater management policies and practices in new development have been effective.

Our more detailed catchment reports give us a more precise idea of where stewardship efforts at tree planting, wetland restoration and shoreline naturalization could make a difference in turning the down arrows around (see page 4 for details).

## Why maintain good water quality?

### Four main reasons:

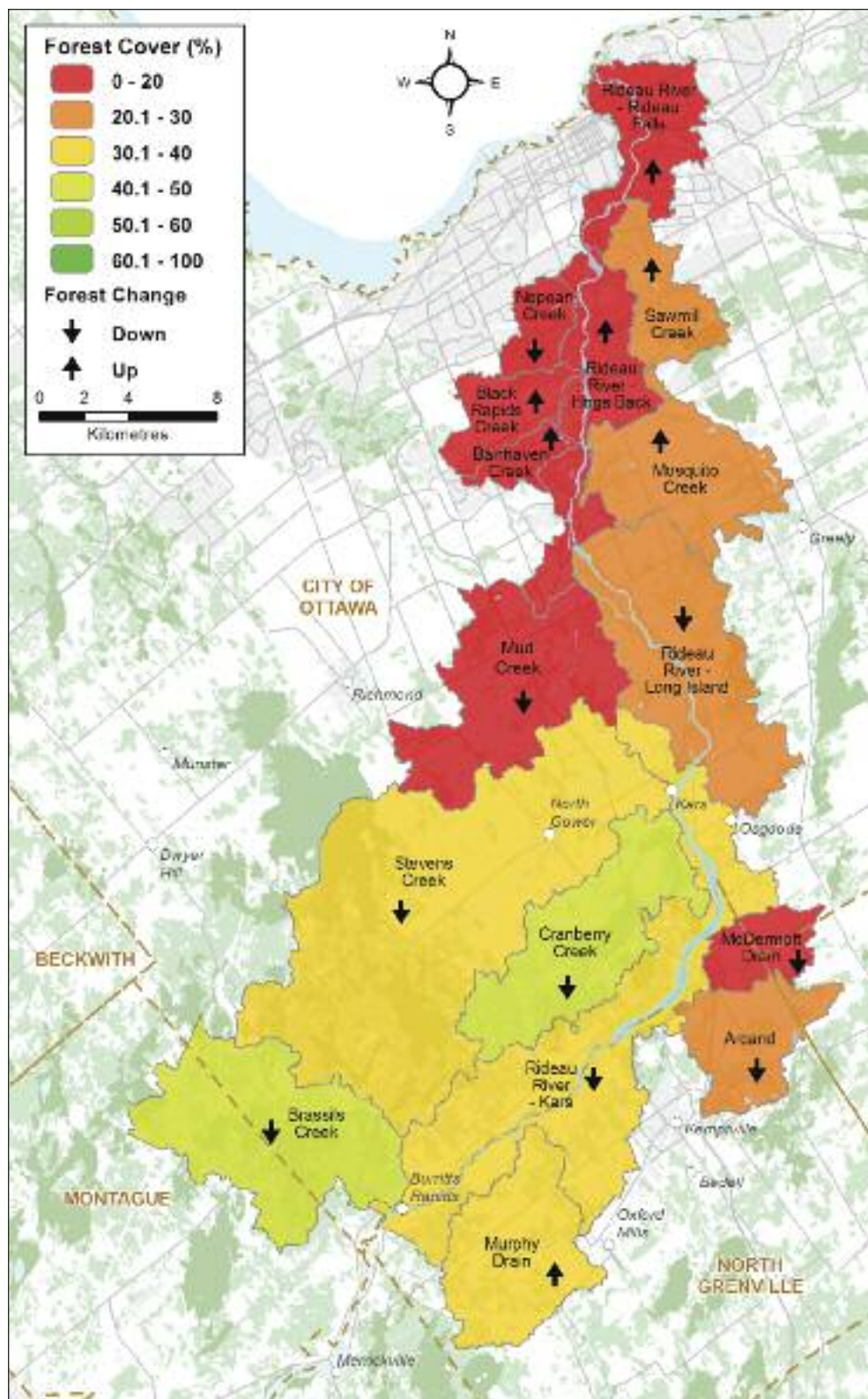
1. Healthy water is fundamental to healthy families and communities
2. A lot of individuals and businesses (particularly agricultural) rely on a natural source of good clean water for farming, fishing, boating, water sports, wildlife viewing and hiking/walking beside the river
3. Good water quality promotes a diverse and healthy aquatic ecosystem
4. In addition, the Rideau flows through the Nation's Capital and is a key piece of the identity and the look of the City of Ottawa



*Water quality sampling*



# Forest Cover







# Forest Cover

## The Benefits of Forest Cover

Forests are important parts of a healthy subwatershed because of their critical role in the water cycle. Runoff from forested lands into streams after a rain or snowmelt is significantly less in both volume and peak flow than runoff from an unforested area. Trees help protect streams from storm or runoff erosion and make subwatersheds more resilient to climate change’s expected heavy, irregular storms and unseasonal precipitation.

In addition, forests:

- Clean the air
- Clean water seeping into the ground
- Encourage infiltration of stormwater
- Harbour wildlife habitat
- Give us wood and wood products
- Create natural buffers for wind and noise in urban settings

Each tree is a little environmental cleaning station that keeps on providing huge ecological and economic services for the people of the Lower Rideau for up to 80 years and more.

Experts believe that a minimum forest cover of 30 percent is needed to sustain the natural biodiversity and environmental services mentioned above. Since the middle of the last century, the general trend across much of Eastern Ontario has been an increase in forest cover (partly natural, partly reforestation) mainly on large sections of marginal farmlands that have since been abandoned.

## Existing Forest Cover in the Lower Rideau Subwatershed

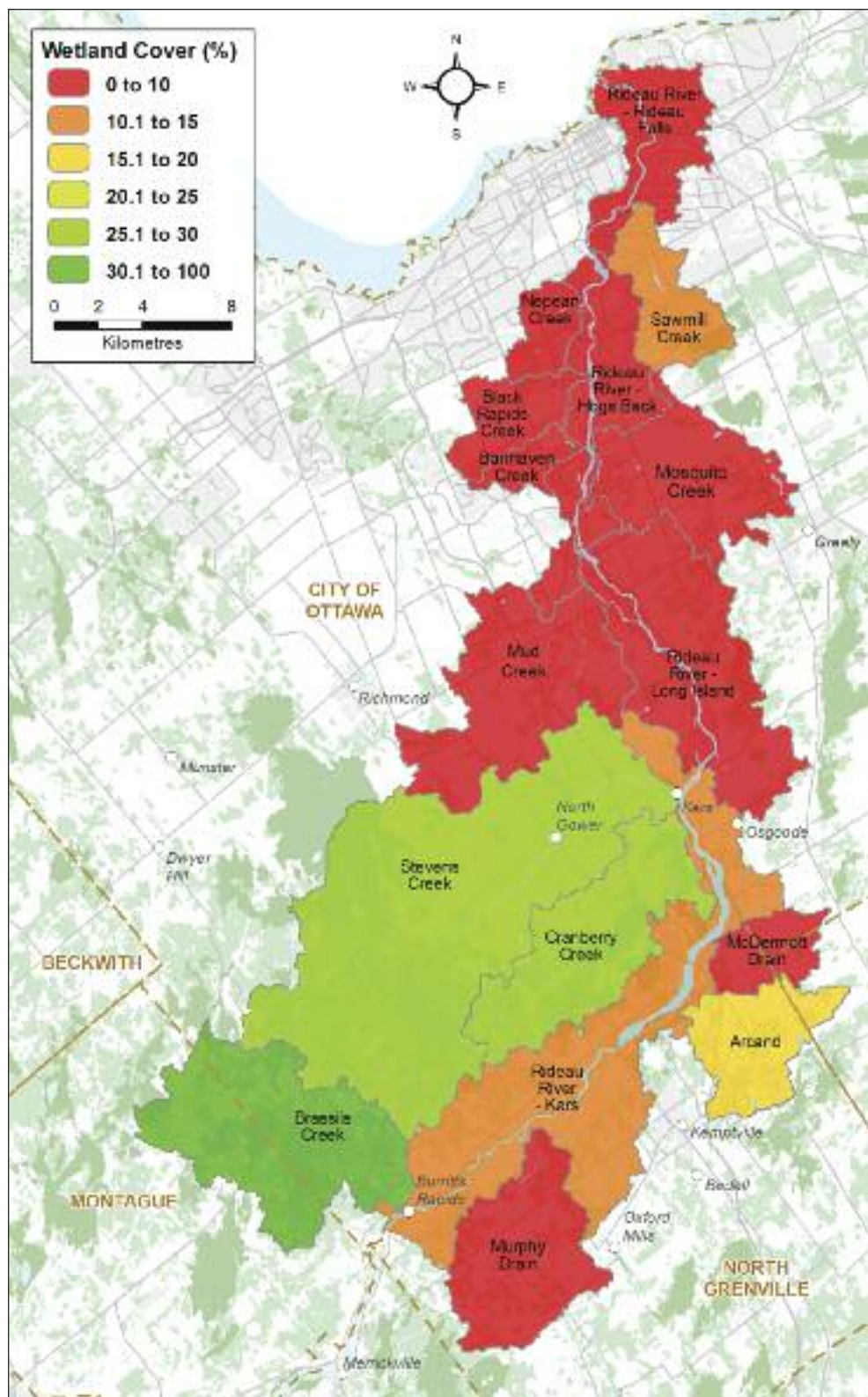
Forest cover in the catchments of the Lower Rideau have been calculated from 2008 DRAPE imagery and compared to previous work done by MNR in 2002. Forest cover ranges from a high of about 45 percent in the Brassils Creek catchment and 42 percent in the Cranberry Creek

Forest Cover by Catchment	
Arcand Drain	23.3%
Barrhaven Creek	7.8%
Black Rapids Creek	10.3%
Brassils Creek	44.5%
Cranberry Creek	41.6%
McDermott Drain	11.1%
Mosquito Creek	20.7%
Mud Creek	19.7%
Murphy Drain	39.6%
Nepean Creek	16.2%
Rideau River – Hogs Back	13.3%
Rideau River – Kars	30.1%
Rideau River – Long Island	21.8%
Rideau River – Rideau Falls	7.1%
Sawmill Creek	24.8%
Stevens Creek	36.5%

catchment to a low of less than 20 percent in seven catchments. For the Lower Rideau as a whole, forest cover was calculated to be 245 square kilometres (32 percent) in 2002 and 220 square kilometres (28.7 percent) in 2008 (representing a 3.3 percent decrease in forest cover). The *Lower Rideau Watershed Strategy* (2005) recommends maintaining or increasing forest cover with a long-term target of between 35 to 40 percent forest cover in the Lower Rideau Subwatershed. The largest percentage declines in forest cover occurred in the Cranberry Creek catchment (-10.4 percent), the Arcand catchment (-8.6 percent) and the Stevens Creek catchment (-5.6 percent) and the Rideau River-Kars catchment (-5.3 percent). The noticeable decline in forest cover and its relation to water quality over a relatively short period of time in all but one catchment south of Manotick is a trend to watch.

Greatest increases in forest cover were in Sawmill Creek (+2.5 percent), Mosquito Creek (+2.4 percent) and Rideau River – Hogs Back catchment (+2.4 percent).

# Wetlands







# Wetlands

## The Benefits of Wetlands

Wetlands are nature’s flood control and water supply reservoirs — places for the temporary storage of runoff from rain and snowmelt. Thanks to our Rideau wetlands, peak flows during floods are lower and low flows are sustained during dry weather. Groundwater supplies are replenished.

RVCA hydrologists estimate that the existing wetlands across the entire Rideau watershed are responsible for a peak flow (and its resulting flood damage) that is about 10 percent lower than what we would see without the wetlands!

Wetlands provide habitat for many common and rare plants and animals as well as fishing, hunting and recreational opportunities like canoeing and bird watching. And wetlands are becoming increasingly valued for the ecological goods and services they provide such as water supply, water regulation, water cleansing and climate regulation. These services have been valued at \$247 per person per year in a recent Ontario study (*Natural Credit — Estimating the Value of Natural Capital in the Credit River Watershed, November 2009*). In other words, wetlands do for free what we would otherwise have to pay millions of dollars to do through technology and infrastructure.

Wetlands are important green infrastructure that provide major benefits. Conserving or restoring wetlands is right up there with tree planting and shoreline naturalization as simple, cost-effective measures with huge watershed management benefits.

## Existing Wetlands in the Lower Rideau Subwatershed

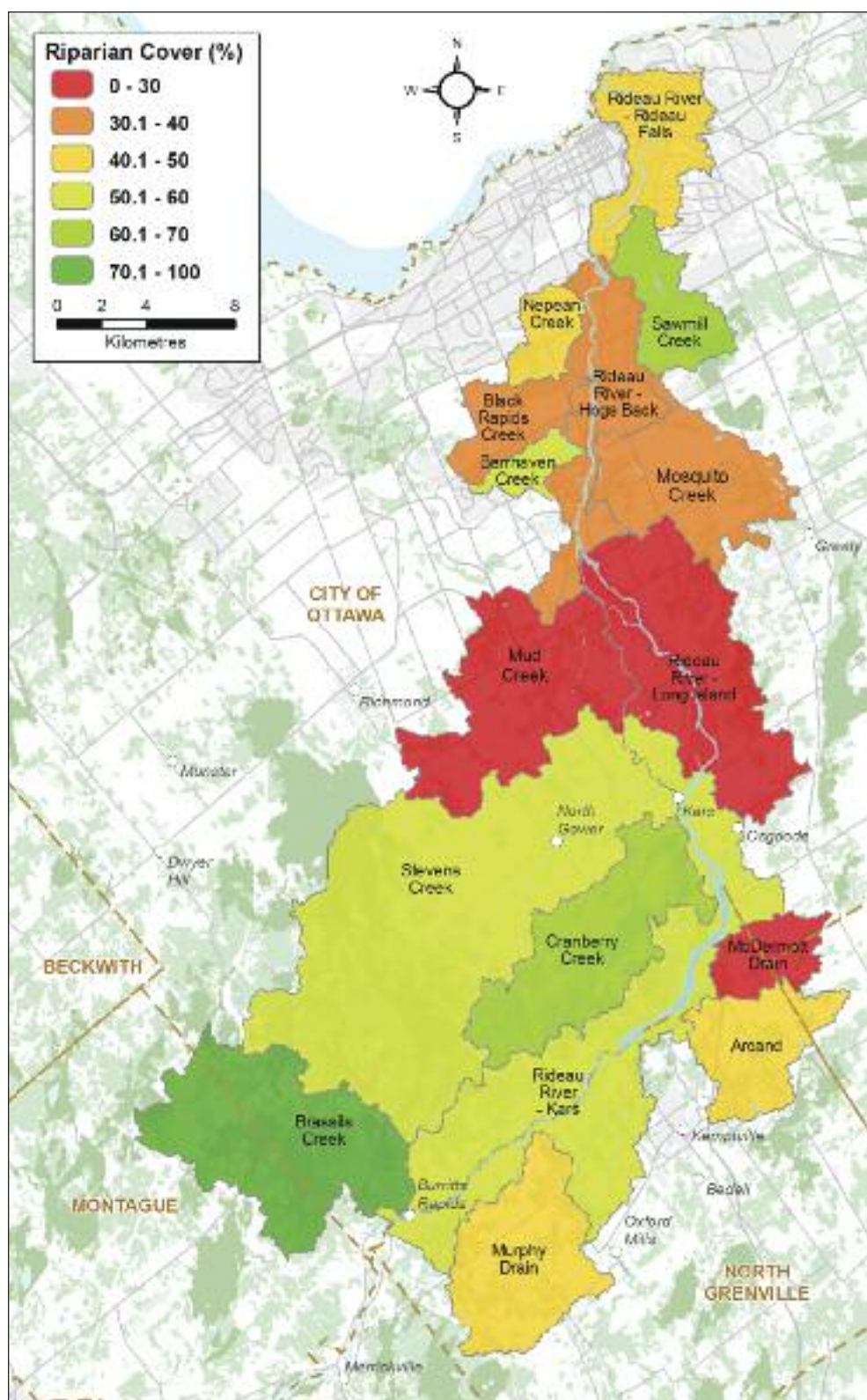
Arcand, Brassils, Stevens and Cranberry catchments are the only four with more than 15 percent wetland cover. The other 12 catchments are below 15 percent with most below 10 percent and five at one percent or less.

Wetland Cover by Catchment	
Arcand Drain	16.0%
Barrhaven Creek	0.4%
Black Rapids Creek	1.3%
Brassils Creek	38.1%
Cranberry Creek	28.3%
McDermott Drain	5.9%
Mosquito Creek	6.7%
Mud Creek	2.0%
Murphy Drain	5.8%
Nepean Creek	0.3%
Rideau River – Hogs Back	0.5%
Rideau River – Kars	14.9%
Rideau River – Long Island	5.1%
Rideau River – Rideau Falls	0.1%
Sawmill Creek	10.7%
Stevens Creek	25.6%

Wetlands in the Lower Rideau (apart from larger wetlands like those in the Marlborough Forest) are mainly small, often isolated and vulnerable lowlands either along a watercourse or in small pockets upstream. Land development of many kinds can threaten the future of small, isolated wetlands. Because of their inherent value to the watershed and the community, existing wetlands wherever they occur in the Lower Rideau are prime candidates for protection and rehabilitation.

The 2005 *Lower Rideau Watershed Strategy* suggests a target of “no net loss of wetland cover” on an individual catchment basis. The balancing act is to work towards retaining as much wetland as possible using a combination of regulations, incentives and willing landowners. These wetland statistics will be reviewed in 2018 in our next report.

# Riparian Cover







# Riparian Cover

## The Benefits of Riparian Cover

The riparian or shoreline zone is that special area where the land meets the water. Keeping well-vegetated shorelines is a primary goal because of their importance in preserving water quality and supporting healthy aquatic habitats. Natural shorelines intercept runoff-borne sediments, pesticides and fertilizers that could reduce water quality and harm fish habitat in streams. Well-established vegetative cover protects streambanks from erosion, improves habitat for fish by shading and cooling the water and provides protective cover for birds and other wildlife that feed and rear young near water.

A recommended riparian cover target in the Great Lakes region is 30 metres of natural vegetation on both sides of a stream for at least 75 percent of its length. This is obviously not achievable on shorelines with established agricultural, residential or commercial uses adjacent to the stream. The

*Lower Rideau Strategy* (2005) set riparian cover targets for the Rideau tributaries at 50 percent of the riparian corridor with a 15 to 30 metre band of woody vegetation (catchments where this target is being met are shown in green on the map).

Riparian Cover by Catchment	
Arcand Drain	41.2%
Barrhaven Creek	52.7%
Black Rapids Creek	35.2%
Brassils Creek	87.9%
Cranberry Creek	62.6%
McDermott Drain	26.5%
Mosquito Creek	36.4%
Mud Creek	26.6%
Murphy Drain	44.3%
Nepean Creek	44.3%
Rideau River – Hogs Back	35.4%
Rideau River – Kars	55.3%
Rideau River – Long Island	25.7%
Rideau River – Rideau Falls	44.0%
Sawmill Creek	60.4%
Stevens Creek	53.1%

## Existing Riparian Cover in the Lower Rideau Subwatershed

Riparian cover indices (expressed as a percentage of the catchment streams with 30-metre wide buffers of natural vegetative cover) are given for each of the 16 catchments of the Lower Rideau. Cover varies from a high of 88 percent in the Brassils Creek catchment to less than 30 percent in a couple of catchments in the Long Reach. The red and orange zones coincide with zones of high residential development and heavy shoreline disturbance. Riparian cover increases again through the urban core of Ottawa due in large measure to the significant amount of public land (municipal and federal) that is kept in a semi-natural state as parkland.



Riparian cover on 1. Mud Creek 2. Mosquito Creek

# Lower Rideau

## Working Together — We are all part of the solution!

We're lucky in the Lower Rideau subwatershed — there is little heavy industry or major point source pollution. What we are up against is a slow, cumulative loss of woodland, natural shoreline and wetland as a result of the wear and tear of suburban life and riparian property management. We're lucky because these losses can slowly turn into gains by giving landowners and communities the means to add these missing elements back into the landscape.

### Working Together

RVCA and other environmental groups are eager to work with you to make your part of the Lower Rideau more environmentally friendly and less susceptible to natural hazards (flooding, erosion, climate change). Working together, we can combine technical expertise and experience with grant programs and personnel to create real, tangible, on-the-ground improvements for your local streams.

#### The types of projects that have worked well in the past include:

- Sustainable erosion control using natural materials
- Shoreline planting of native trees and shrubs
- Large scale tree planting on retired/abandoned land
- Shoreline buffers for habitat and erosion control
- Wetland protection buffers
- Wetland restoration
- Invasive species removal
- Garbage clean ups
- Livestock restriction/alternate watering systems
- Land retirement
- Fish habitat enhancement projects
- Migratory fish obstruction removals



1. Shoreline planting 2. Mosquito Creek 3. Fish habitat enhancement at Chapman Mills Conservation Area 4. Sawmill Creek  
5. Young seedling from RVCA's tree planting program





## How can you get involved?

This report identifies some areas of the Lower Rideau subwatershed where water quality and natural habitat conditions are less than ideal. These areas, along with others across the subwatershed, can be improved through work by community associations, environmental groups, families, individuals and collaboratives of all sorts. The following stewardship programs may be of interest to Lower Rideau municipalities and residents:

- For shoreline naturalization, contact the RVCA Shoreline Naturalization Program Manager at 613-692-3571
- For tree planting, contact the RVCA Forestry Manager at 613-692-3571
- For farm and clean water projects, contact the RVCA Rural Clean Water Manager at 613-692-3571
- For environmental farm projects, contact Ontario Soil & Crop Improvement Association at 1-800-265-9751
- For wetland care projects, contact Ducks Unlimited Canada at 1-866-389-0418
- For fish and wildlife projects, contact MNR Kemptville at 613-258-8426
- To volunteer for City Stream Watch (stream assessment/restoration activities), contact [citystreamwatch@rvca.ca](mailto:citystreamwatch@rvca.ca)
- For possible donation of land to an environmental agency for keeping in its natural state in perpetuity, contact the Executive Director, Rideau Valley Conservation Foundation at 613-692-3571
- For carbon neutral projects, contact the Executive Director, Rideau Valley Conservation Foundation at 613-692-3571

If you are planning projects on your property, be sure to check with RVCA to see if permits are required. Checking first can save you from making costly mistakes. If you are thinking of buying property, we can let you know if the property is likely to be affected by Authority policies and regulations. Working together, we can save a lot of stress, time and money.





1. Rideau Falls 2. Water quality sampling at Black Rapids Creek 3. Brassils Creek 4. Water quality monitoring





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