Credit Valley Conservation

State of our Watershed

Review of Trends and Opportunities

Water Quality & Quantity

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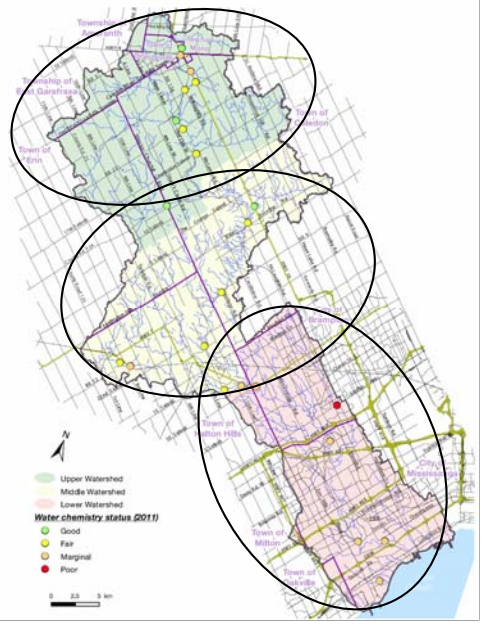
Credit Valley Conservation

Quality: Current State

- Upper: Metals, Nutrients, Chlorides
- Middle: Metals, Nutrients, Chlorides
- Lower: Metals, Chlorides, Total suspended solids
- Temperature



The quality of our groundwater and surface water are negatively impacted by human activities. Contaminants, such as excess nutrients, pesticides, metals, pharmaceutical products and bacteria are entering the Credit River. For a long time, the Credit River has been able to naturally buffer these impacts; however, the Credit is becoming increasingly stressed and unable to buffer human activities.

Generally, water quality varies from good to poor across the watershed. In areas of poor quality, the river is generally receiving water from wastewater treatment plants (WWTP), agricultural activities and urban runoff. The Credit River begins with good water quality below Island Lake, however the quality quickly declines to marginal in response to high concentrations aluminum, chloride and phosphorus, potentially from urban runoff, road salt applications and input from the WWTP.

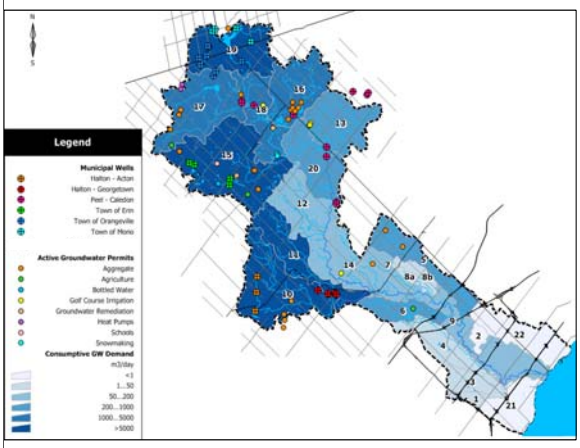
Groundwater is fed throughout the Credit River, a considerable amount of which enters through the mid-section of the Credit, greatly improving the quality of water through providing cold and clean water into the stream. Having said this, through Source Water Protection and Servicing and Settlement Master Plans we are seeing increasing nitrate levels and other contaminants entering our groundwater supply, like chloride.

Water quality subsequently declines through the middle and lower portion of the watershed as the credit meanders through more densely urban areas. In the middle portion chloride, phosphorus and aluminum concentrations regularly exceed guidelines. For example, in Black and Silver Creeks we again see high concentrations of these contaminants. These streams receive discharge from WWTP in Acton and Georgetown respectively, as well as urban contaminants. These tributaries then flow into the Credit River reducing the water quality of the river.

In the Lower Watershed, concentrations of chloride, phosphorus, aluminum, copper and iron often exceed guidelines; and sediments from green field construction are causing impacts. Fletcher's Creek has the poorest quality of water of any tributary entering the Credit. As well concentration of chloride in lower subwatersheds, like Sheridan Creek, are very high (about 7 times the water quality guideline).

Water temperature is closely linked to and can exacerbate certain water quality issues. Water temperature closely follows air temperature. Given that some of the warmest air temperatures of the last 40 years have occurred during the last 10 years it is not surprising that many of the water temperature stations throughout the watershed have regularly exceeded their temperature targets. Since 2004 water temperatures have regularly exceeded the preference of coldwater fish in the Credit River Watershed.

Quantity: Current State

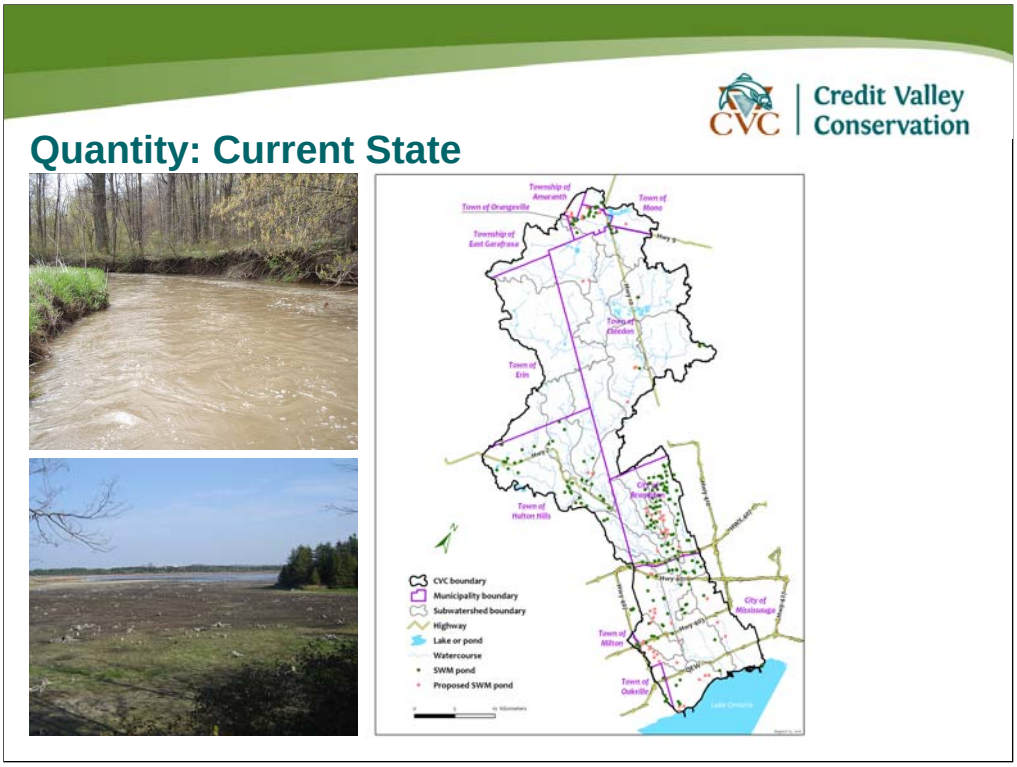


- Highest consumptive water demand:
  - Surface water: golf course irrigation;
  - Groundwater: municipal takings in middle and upper watershed

Three main challenges face water quantity in our watershed. The first being availability of water for consumption. Water is consumed through direct takings from the Credit River or from groundwater.

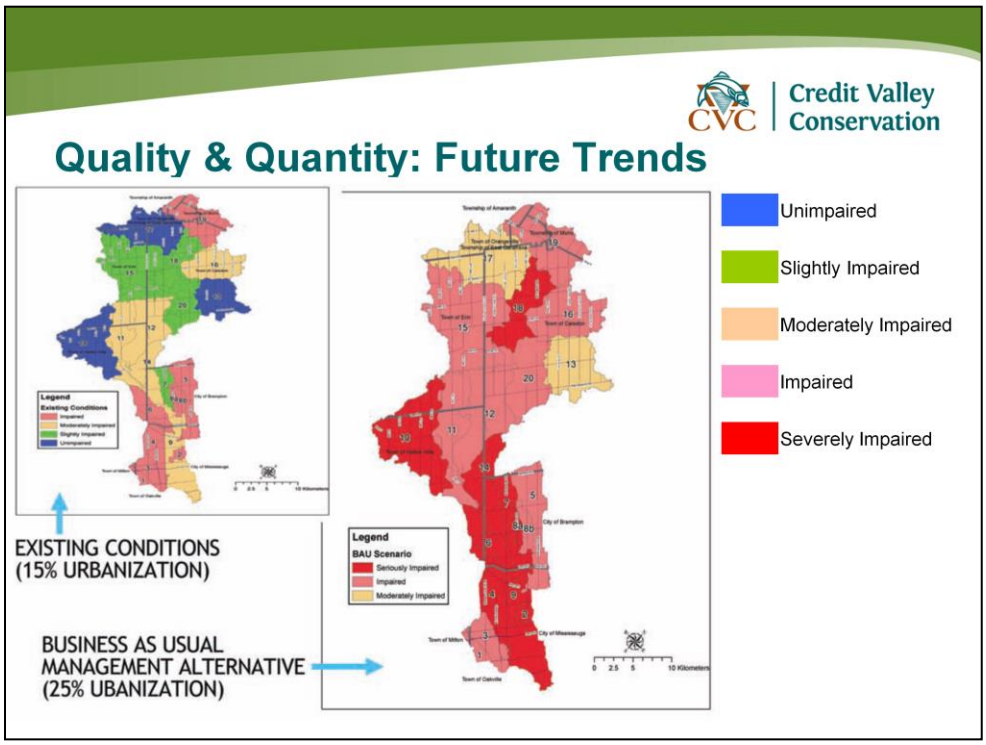
The first figure shows water being taken directly from the Credit. The dark green areas represent the highest quantity of taking. This is primarily used for golf course irrigation.

The second figure shows water being withdrawn for groundwater uses. The dark blue areas represent portions of the watershed that have the greatest amount of taking. This is primarily used for municipal water demand.



The other two important factors to consider when thinking about flow is high flows and low flows. High flows can be flows that cause flooding. We know given recent events the impacts of these flows. However, high flows can also refer to flows that cause erosion. Monitoring results in the watershed have shown that while stormwater ponds hold water from a rain event back, they generally release the water at the same time and for a longer period of time then what would have occurred during a rain event in a more natural area. These extended high flows can cause a number of impacts to infrastructure that are costly to repair. This figure shows the locations of ponds in our watershed currently and proposed.

Low flows are also very important. They can result from a period in which there is no rainfall. They can impact the ecology of the stream, but they can also impact the ability of the stream to assimilate discharge from wastewater treatment plants. Given the change in storm events this may be something we need to pay more attention too.



Future predictions – in 2007 CVC, in partnership with municipal partners, undertook a watershed study titled the Credit River Water Management Strategy Update. As part of this study a modeling exercise was done to evaluate current watershed conditions and how they will change in light of future growth and demand on the watershed up to 2031. The modeling results found that much of the watershed would become impaired to severly impaired. However, with the modeling we were able to apply best management practices. Through this we not only were able to mitigate the impacts of future growth but also improve existing conditions in the watershed.

In 2012, local-scale water budget studies were done to assess the impacts of increased municipal groundwater takings on baseflow to rivers, tributaries and wetlands in Subwatersheds 10, 11 and 19. The analyses applied 2031 population growth, and assessed recharge reduction related to landscape changes. It did not consider climate change or best management practices (LIDs etc.).

The results showed potential reduction in baseflow for the following coldwater streams:

Acton (Subwatershed 10): Lower Beeney Creek – 22%, Georgetown (Subwatershed 11): Hospital Tributary – 50%

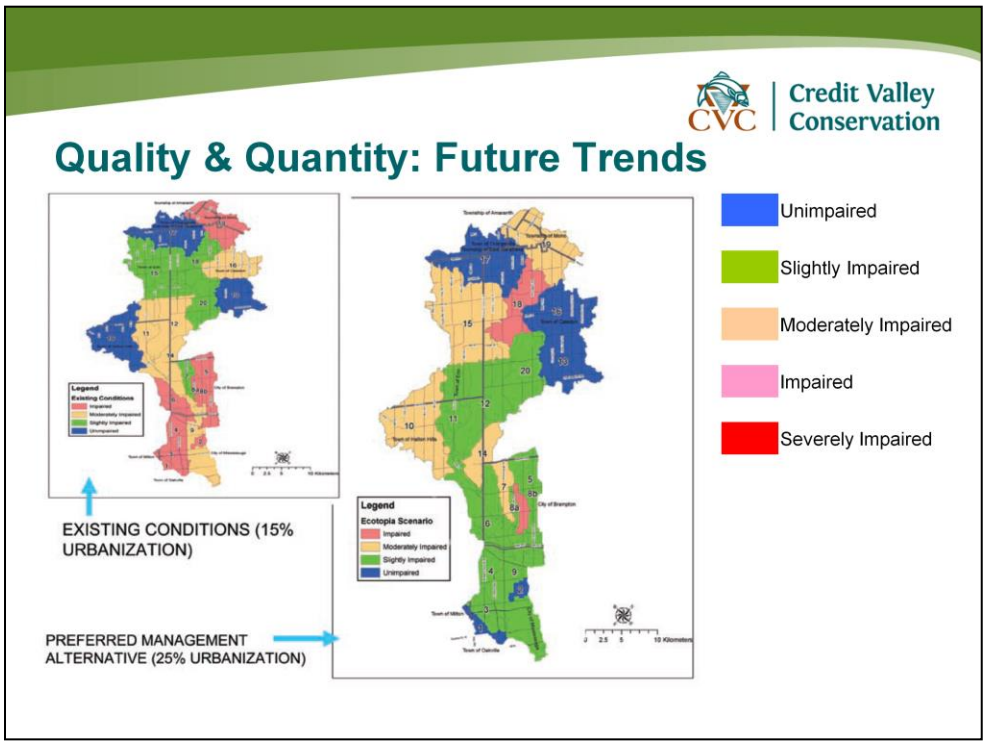
Orangeville (Subwatershed 19):

Upper Mill Creek – 27%

Lower Mill Creek – 22%

North Arm, Lower Monora Creek – 15%

South Arm, Lower Monora Creek – 17%



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Quality and Quantity: Future Actions

Moving forward, we should consider...

1. More rigorous and aggressive adoption of the CRWMSU recommendations, as well as the recommendations in subwatershed studies and other strategies that have been founded on really good science;

2. Given that we have better tools and more information we should consider updating the watershed plan in order to provide improved understanding of watershed stressors and provide guidance for futre land use planning; and

3. Lastly, we need to be able to react to emerging issues that may come up, like personal care products.


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