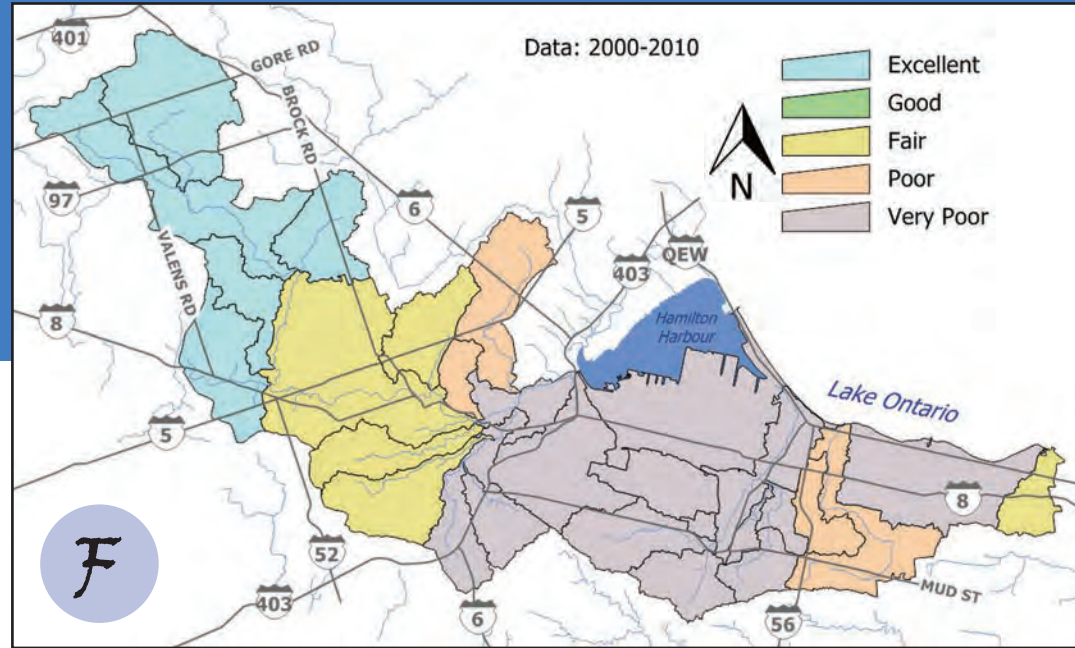




Impervious Surfaces

Changes to the landscape impact the natural environment. Land use activities can contribute to changes in the quality and quantity of water and can fragment habitats in our watersheds.



The amount of impervious surfaces found in a watershed is a good indicator of the effects of urbanization. Impervious surfaces show areas where land use has changed from natural space to infrastructure. A surface is impervious if it does not allow water to pass into the soil, such as pavement or rooftops. Impervious surfacing can affect the health of a watershed by fragmenting habitat and by reducing water quality and increasing water quantity.

Environment Canada indicates that a stream should be able to maintain healthy water quality and quantity levels if a watershed has less than 10 percent impervious surfaces. However, if a watershed has more than 30 percent, its aquatic ecosystems become degraded.

The western sections of HCA's watershed, composed of mainly natural and agricultural lands, have a lower percentage of impervious surfaces, while the residential, commercial and industrial land use practices within the central and eastern areas of the watershed have resulted in more impervious surfaces. This is reflected in the other indicators, where watershed health is generally better in the upper watershed, becoming more degraded within the urbanized portions of the city.

When water seeps into the ground, it is naturally filtered of pollutants, and the amount of time it takes to get to a stream is slowed down, reducing stream-bank erosion and flooding. Impervious surfaces result in fewer plants and natural surfaces to filter out pollutants. As a result, streams receive less shade and plant matter, reducing the number of insects, fish and amphibians living in them.



What You Can Do

In the same way that our individual actions can accumulate and degrade our natural areas; if we all make it a priority to improve our habits, collectively we can preserve and restore the natural environment of the Hamilton area for future generations.



Here's how you can make a difference:

Eliminate the use of fertilizers and pesticides on your property. These chemicals can easily contaminate our groundwater supply and our creeks.

Try gardening and landscaping with native plants. Plant native wildflowers and grasses instead of typical lawn grasses. Plant native trees and shrubs rather than exotic ornamental species. Non-native species require constant care to survive here. Native species are naturally adapted to our climate and soils. They require less maintenance and do not require watering as they are naturally drought resistant.

Do not encroach on natural areas adjacent to your property. Dumping yard waste into natural areas smothers plants that are trying to grow on the forest floor. Compost your yard waste or put it at the roadside for municipal waste collection.

Instead of expanding your lawn or garden into the natural area, try incorporating some of the natural area into your yard. Expand the natural area by allowing a portion of your yard to regenerate naturally or try gardening using the same species that you have found in near

by natural areas. Never remove plants from a natural area. They could be rare or endangered species.

Maintain or upgrade your septic system. Keeping your septic system in working order can greatly reduce the potential for contaminating your groundwater supply. Remember to have your septic tank pumped out every two to three years.

Maintain and upgrade any groundwater wells on your property. Wells are direct access points for contaminants to enter into our drinking water supplies. You have a responsibility to seal old abandoned wells that are on your property. These old wells are not only a potential route for contaminants but are also safety hazards for people and wildlife.

Don't dump garbage in natural areas. These items create hazards for children playing in these areas and for wildlife. Instead, take advantage of the City of Hamilton's Waste Management Services. The municipality offers a variety of free services to its residents, including the disposal of household appliances/scrap metal, hazardous waste, yard waste and old furniture.



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Hamilton WATERSHED Report Card 2013



Where Are We?



We are one of 36 Conservation Authorities across Ontario under the umbrella organization of Conservation Ontario.

HCA has five major watersheds within its boundaries. They are Spencer, Red Hill and Stoney Battlefield Creeks as well as the Stoney Creek Numbered Watercourses and Urban Hamilton. For more information on these watersheds please visit: www.conservationhamilton.ca

What Does This Report Card Measure?



Impervious Surfaces



Forest Conditions



Surface Water Quality



Wetlands



Riparian

Why Measure?

Measuring helps us better understand our watershed. It helps us to focus our efforts where they are needed most and track progress. It also helps us to identify healthy and ecologically important areas that require protection or enhancement.

What is a Watershed?

A watershed is an area of land drained by a river or stream. Similar to the branch of a tree, creeks empty into streams, which then empty into larger streams, eventually forming one main trunk. Within this system, everything is connected to everything else. In other words, actions which take place at the top of the system can and do affect those downstream.



Grading

A	Excellent
B	Good
C	Fair
D	Poor
F	Very Poor

The standards used in this report card were developed by Conservation Authorities to ensure consistent reportings across the Province of Ontario and are intended to provide watershed residents with information to protect, enhance and improve the precious resources that surround us.

Data supplied by City of Hamilton and Land Information Ontario.

Cover Photo: Crooks Hollow dam removal and natural channel design project.

Hamilton Conservation Authority has prepared this report card as a summary on the state of our forests, wetlands, surface water, and ground water resources.

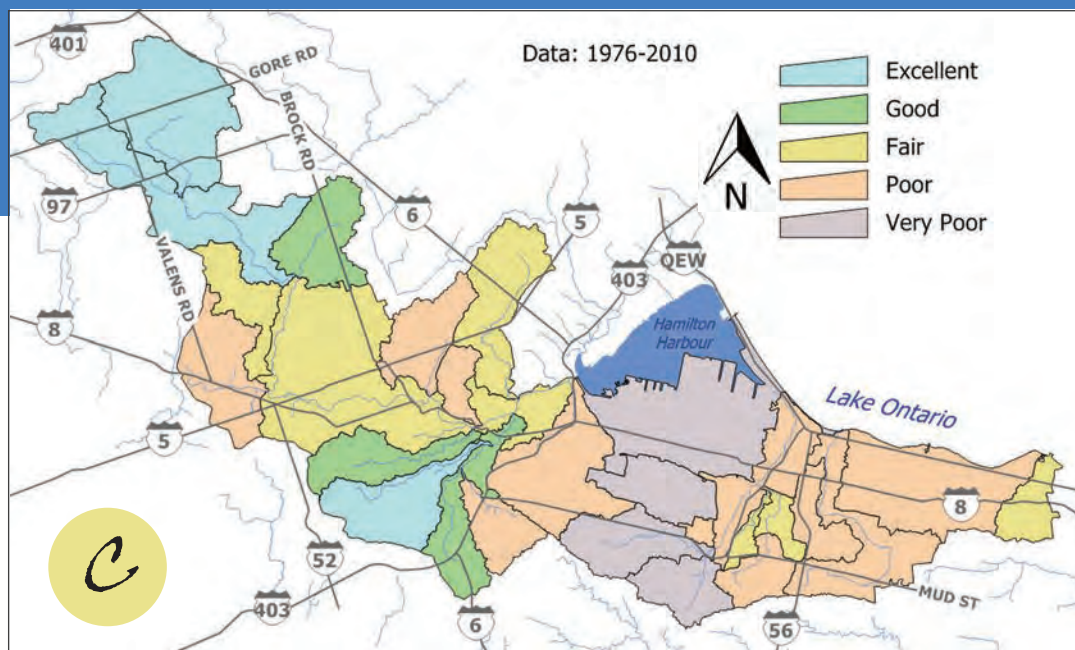
Available in an alternate accessible format.





Forest Conditions

Southern Ontario has had a long history of intensive land settlement and deforestation. Much of the land in this part of the province is held privately or by municipalities. Today, a substantial amount of the forest cover in southern Ontario exists because private landowners maintain woodlands, and municipalities and Conservation Authorities maintain forested sites. HCA owns or manages over 10,000 acres of natural lands.



Forest ecosystems are an important part of a healthy watershed. They can reduce the effects of climate change by absorbing carbon dioxide gases that contribute to the "greenhouse effect", provide habitat for plants and animals, reduce sedimentation, regulate flooding and drought periods in watercourses, give people a psychological boost and increase our property values.

western and central regions. Forest cover ranges from a high 58% in the Sulphur Creek subwatershed of Spencer Creek to 0% in the Greenhill subwatershed of Red Hill Creek. Urbanization has limited forest cover in the eastern subwatersheds. However, within some subwatersheds of Red Hill Creek, and in Fifty Creek, there are areas of significant forest cover.

Since 1994 the Hamilton-Halton Watershed Stewardship Program, a part of the Hamilton Conservation Authority, has worked with landowners to undertake planting projects to enhance forest habitat. To date 144 acres of forest habitat have been established in the Hamilton Conservation Authority watershed.

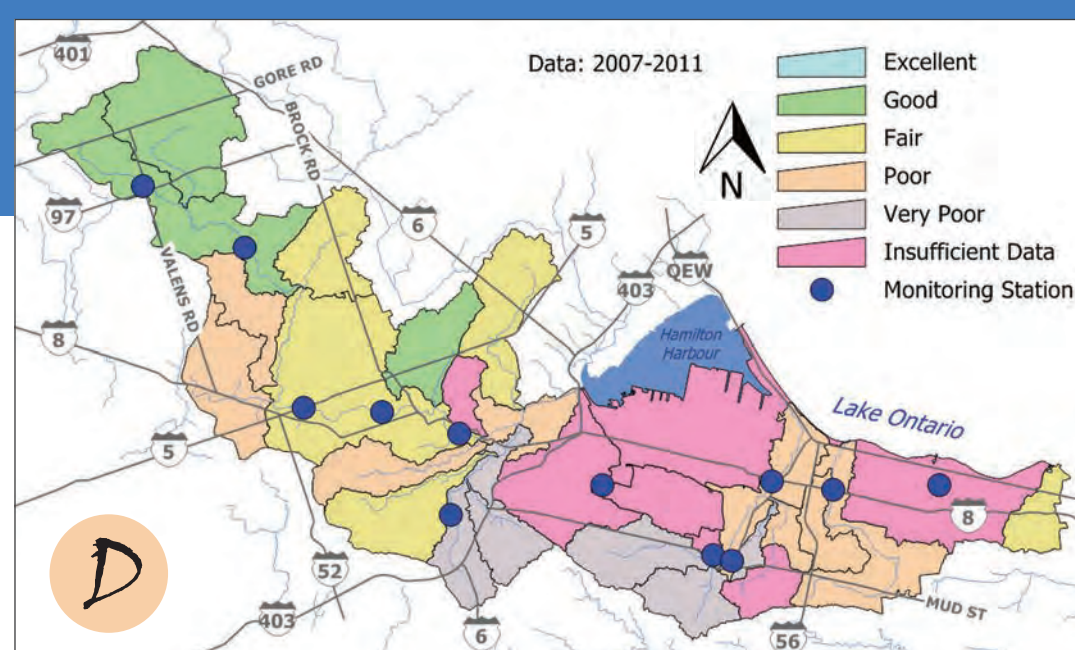
¹ Env. Can. 2004. *How Much Habitat is Enough? A Framework for Guiding Habitat Rehabilitation in the Great Lakes Area of Concern.*

Within HCA's jurisdiction, overall forest cover is approximately 19% with the majority of the forest cover occurring in the



Surface Water Quality

Clean water is an important component of a healthy watershed. It helps support diverse aquatic habitat, enhance recreation potential and improve the well-being of those who use it. It also adds to the aesthetic appeal of the natural environment. Monitoring stream water quality can help us understand the impacts of land-use activities, enabling us to make informed decisions about managing and protecting our water resources.



HCA monitors surface water quality as part of the Provincial Water Quality Monitoring Network (PWQMN) and the Ontario Benthos Biomonitoring Network (OBBN). PWQMN water samples are collected from March to October at numerous locations across the watershed to analyse many chemicals, metals, sediment, bacteria, and temperature – all which can be elevated from different land use practices. For this report, E. coli bacteria and phosphorus are assessed as they have historically been elevated in many watersheds across the province.

OBBN samples, which are a collection of small insects and other organisms that live within or attached to the bottom of streams, are collected in the spring. Based on the types of organisms found, this collection provides a good indication of the water quality.

Water quality in the subwatersheds of Spencer Creek, in the western areas of the major creek systems within HCA's jurisdiction, ranges from very poor to good, with the best water quality found in the headwaters where natural land cover remains high. The water quality decreases as the watercourses traverse through agricultural and rural lands and ultimately through urbanized centres.

A true comparison with the previous watershed report card data cannot be made as the category ranges have changed. This has been done to develop a consistent ranking system across Ontario. The current analysis indicates that 13 of the subwatersheds have received a grade of D or below. These grades are indicative of the urban surroundings of most of the watercourses within the HCA jurisdiction. Headwater areas of Spencer Creek receive the highest grades as they are located in areas which remain largely in a natural state.

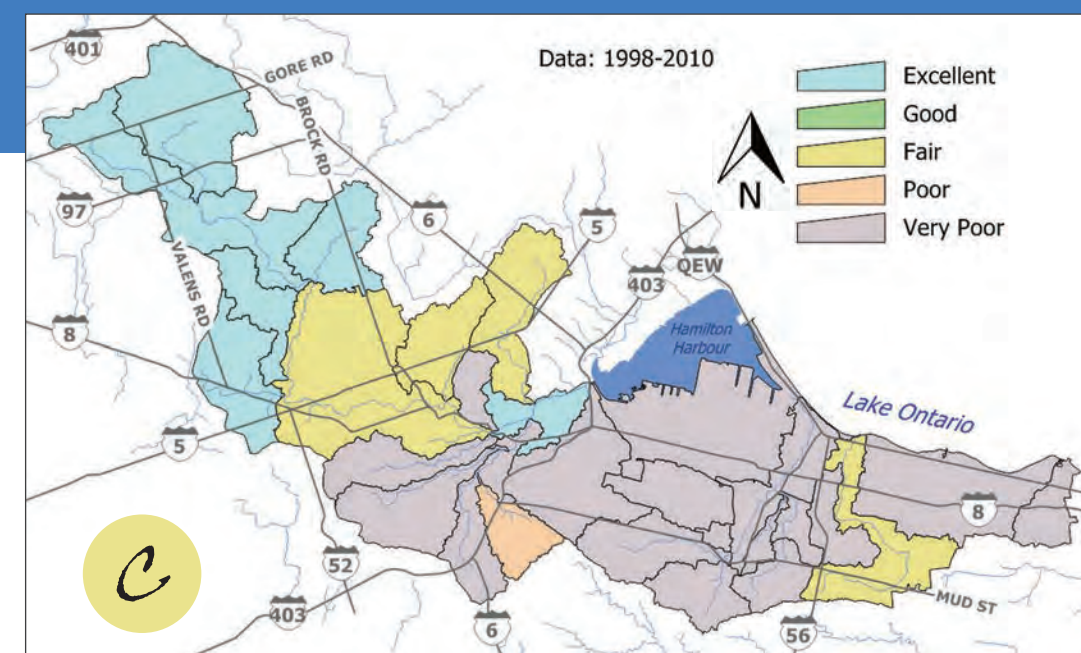
HCA works to improve water quality to ensure healthy streams and healthy communities in which human needs are met in balance with the needs of the natural environment, now and in the future. The HCA is committed to its continued efforts to work with private landowners and industry to meet these needs, while recognizing the constraints that exist within an urban environment.

The map shows water quality ratings that are from a point sample within a subwatershed and may or may not characterize water quality conditions throughout that watershed area. i.e. benthic locations located near outlet of subwatershed. Not all subwatersheds contain all three indicators for analysis.



Wetlands

Wetlands are known as transitional habitats, which often form the connection between aquatic and terrestrial systems. Wetlands are defined as lands that are saturated with water for an extended amount of time to cause the development of waterlogged (hydric) soils and growth of water tolerant vegetation. Wetlands can occur in a variety of landscapes including areas where the water table is close to the surface, in low lying areas, or along the edge of lakes and rivers. Wetlands can either be periodically flooded during the spring and fall months, or like most wetlands in the area are considered to be permanently flooded.



There are many benefits of wetlands including groundwater recharge and discharge. They act as water filtration systems and store floodwaters during rain events and snowmelt. Wetlands are also essential to many plant and animal species that depend on wetland habitat for all or part of the duration of their life processes (feeding and nesting areas); such as marsh birds, ducks, fish, turtles, frogs, and salamanders.

The subwatersheds of Spencer Creek within the western portion of the HCA's watershed, have a high concentration of wetlands which therefore receive an "A" grade. This includes the Fletcher Creek subwatershed that consists of 31% wetland cover and the Upper Spencer Creek subwatershed, made up of 29% wetland cover.

Westover, West Spencer and Flamborough Creek subwatersheds also received an "A" grade for wetland cover. There is however an uneven distribution of wetland cover throughout the watershed, as the subwatersheds in the eastern portion of the watershed received very low grades. The subwatersheds of Red Hill Creek have 0% to 1% wetland

cover and each received a rating of Very Poor. However, Stoney Creek subwatershed, within the Stoney/Battlefield Creek watershed, has 5.9% wetland cover which received a "C" grade. Urban and rural development within this area of the watershed is high, and therefore has greatly altered wetland function and or removed habitat all together.

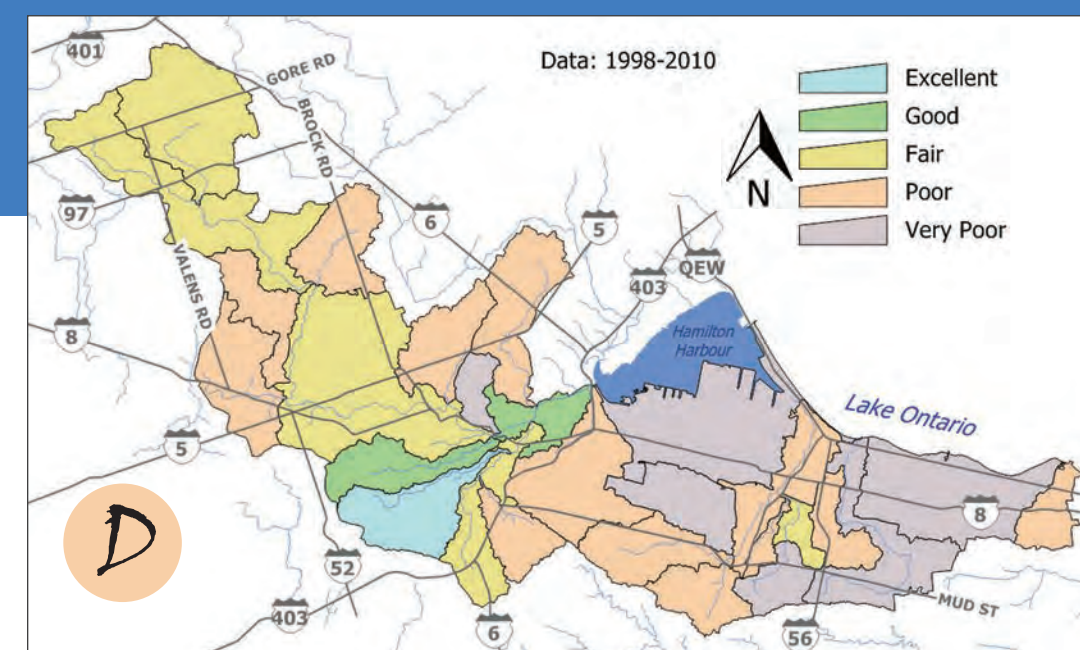
Environment Canada (2004) recommends restoring wetland cover to 6% for a subwatershed and 10% for a major watershed as a target for a healthy watershed.

HCA is dedicated to the restoration of wetlands within its jurisdiction, and implements a long term monitoring program which includes marsh bird and amphibian population surveys to help determine the health and ecological integrity of the wetlands systems and long term trends. Where wetlands have been lost, HCA is committed to obtaining key partnerships to help rebuild wetlands in areas, where needed, to help facilitate biodiversity and land use function.



Riparian

Riparian buffers are strips of trees, shrubs and grasses that run along creeks and surround wetlands. The HCA has used aerial photography to map the riparian buffers in our watersheds. From this mapping we can identify creeks and wetlands that have healthy, well-established buffers and where these important ecological safeguards need improvement.



Riparian buffers function as water filters. When it rains, buffers trap pollutants and eroded soil, before they get into the creek. While keeping the creek water clean, buffers provide food, shelter and shade for fish, frogs, birds and small animals. They also stabilize creek banks, which helps prevent soil erosion.

Environment Canada's Habitat Guidelines recommend that 75% of a watercourse be buffered on both sides for ecological health. They also recommend a 30 metre buffer along cold water creeks and a 15 metre buffer along warm water creeks for these ecological features to function optimally. There are many creeks in our watersheds that do not meet these standards.

The map of HCA 2009 riparian buffer data shows that most of the urban creeks in the central and eastern subwatersheds within HCA's jurisdiction have insufficient riparian buffers when compared to these environmental standards. The west-central subwatersheds and headwaters of Spencer Creek in the rural areas of our watersheds show an increase in vegetation, however still fail to have optimal riparian cover along these watercourses and wetlands. The Dundas Valley area shows

good to excellent riparian buffers. We are continually working to preserve and improve these important ecological features. A direct comparison of riparian buffer conditions cannot be made with the previous report card as the method for analyzing riparian buffers was expanded between reporting periods to include buffers adjacent to wetland boundaries and waterbodies. The grading scheme has also been changed to be consistent with the grading scheme for the other categories in this and all other future report cards.

HCA aims to, where possible, have every creek meet the standards for riparian buffers as defined by our governing environmental organizations. The HCA is committed to its continued efforts to work with private landowners to establish as wide a buffer as their property permits.

Since 1994, the Hamilton-Halton Watershed Stewardship Program, part of the Hamilton Conservation Authority, has worked with landowners to undertake planting and naturalization projects to enhance riparian buffers. To date, nearly 17 km of riparian buffer have been established in the Hamilton Conservation Authority Watershed.



Photo courtesy, Mark Funk

