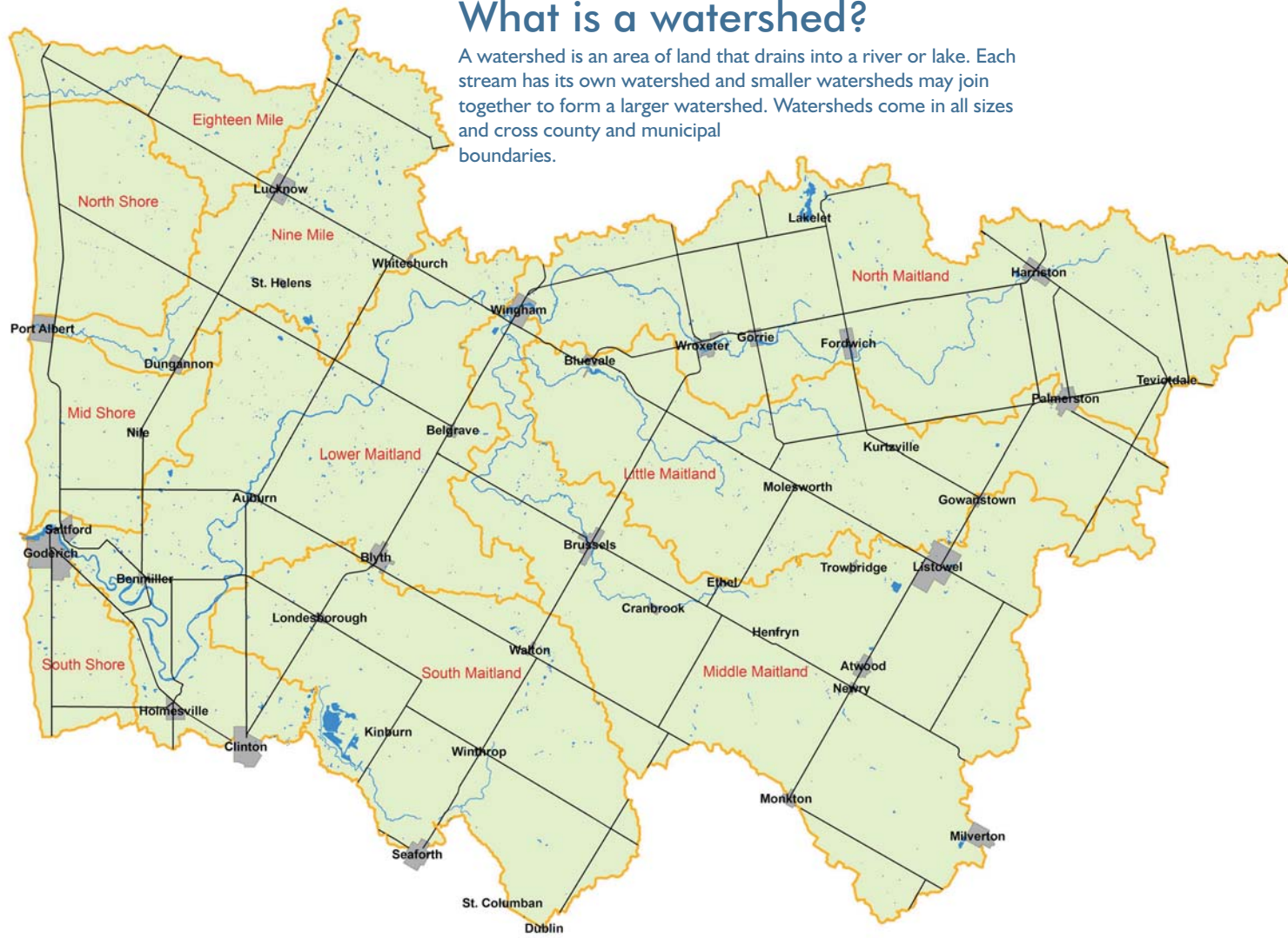


Indicators & Results

What is a watershed?

A watershed is an area of land that drains into a river or lake. Each stream has its own watershed and smaller watersheds may join together to form a larger watershed. Watersheds come in all sizes and cross county and municipal boundaries.



Maitland and Nine Mile Watersheds

The MVCA's area of jurisdiction encompasses the watersheds of the Maitland and Nine Mile Rivers as well as numerous streams and gullies that drain directly into Lake Huron. The Maitland watershed is 2,592 square km and is comprised of five major sub-basins, the North Maitland, Little Maitland, Middle Maitland, South Maitland and Lower Maitland. The Maitland River is 150 km in length and empties into Lake Huron at Goderich. Under normal flow conditions it takes 1.5 to 2 days for a water droplet to travel from the headwaters to the mouth of the Maitland River in Goderich.

Much of the watershed is comprised of level to rolling fertile agricultural land. The area has a very high concentration of livestock. The southeast end of the watershed has extensive artificial drainage and few natural

areas. The northern portion of the watershed contains more forested and natural areas. The Lake Huron shoreline forms the west boundary of the watershed, much of it featuring high, erosion-prone bluffs. There is a significant band of cottage development along the shoreline.

The Nine Mile River watershed is 243 square km and outlets into Lake Huron at Port Albert. Including the shoreline sub-basins the total area encompassed by the MVCA is 3,266 square km. The population of the watershed is approximately 60,000. Agriculture is the dominant land use in the area with small urban areas scattered throughout the watershed. Communities in all these areas need to work collectively to effectively protect and enhance watershed resources.

What do the Grades Mean?

The grades used in this report card are based on the Conservation Ontario provincial grading system. The simple grading system makes it easy for readers to assess the health of the watershed in general terms.

- A** = very healthy watershed conditions
- B** = healthy watershed conditions
- C** = watershed conditions require some enhancement
- D** = poor watershed conditions that require improvement
- F** = watershed significantly degraded requiring much improvement

The Watershed Report Card initiative will enable the MVCA to:

- identify trends in watershed health
- determine additional data required for a more complete assessment of watershed health
- identify priority areas for conservation efforts

Surface Water Quality - Monitoring results from four indicators have been used to determine the surface water grade: total phosphorus concentrations, benthic macro-invertebrates, E. coli concentrations and nitrate.

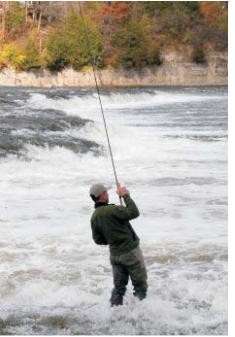
INDICATORS	GRADE	RESULT	INDICATOR DESCRIPTION
Total Phosphorus	B	.0317 (mg/L)	Phosphorus occurs naturally in our streams and rivers but high concentrations from human activities contributes to excessive algae growth and low oxygen levels. Phosphorus binds to soil particles so high levels indicate that soil sediment is entering the watercourse. Phosphorus is found in products such as soap, detergents and fertilizers. Provincial Water Quality Guidelines indicate that levels greater than .03mg/L result in unhealthy stream conditions. The 75th percentile (75% of data fall below this value) was calculated for the total phosphorus data. The use of the 75th percentile reflects the tendency of the data to be dry weather biased. During dry periods levels are low and then rise following rain events. Although phosphorus levels are elevated these levels have remained stable and have declined slightly in some areas.
Benthic Macro-Invertebrates (FBI)	B	5.218	Benthic macro-invertebrates are the bugs that live at the bottom of streams. The diversity and abundance of these organisms is a good indicator of stream health and water quality. Since these organisms don't travel significant distances in the water their presence provides an indication of water quality conditions over time. The Hilsenhoff Family Biotic Index is used to assess the number and type of organisms in a sample. Invertebrate species are given a score related to pollution tolerance, the lower the number the more pollution intolerant the species is. The lower the score the healthier the watercourse. The average benthic value was calculated for samples taken between 2001 - 2006, some samples from 2008 were also included.
E. coli (Colony Forming Units)	C	133.1 CFU/100ml	E. coli (Escherichia coli) is a general name for a common bacterium found in the intestines of humans and animals. There are many different strains of E. coli. Most are harmless or actually beneficial, but some can cause serious illness in humans. The presence of E. coli indicates water contamination and the potential for human health risks. Ontario Recreational Water Quality Guidelines suggest that waters with less than 100 coliform-forming units/100ml are safe for swimming. The geometric mean for samples collected during the study period was used to determine the watershed result.
Nitrate	B	5.76 (mg/L)	High concentrations of nitrates make water unsafe for human consumption. Sources of this indicator include waste water, septic systems and fertilizers. The interim Provincial Water Quality Guideline for nitrate is 2.93 mg/L. Levels above the guideline are toxic to the eggs of fish and amphibians. Across the watershed nitrate levels rose sharply from the mid-1970's to the mid-1980's. Since that time levels appear to have stabilized.

Groundwater Quality - Groundwater data is collected through the Provincial Groundwater Monitoring Program. Two indicators are used to assess groundwater quality:

Nitrites and Nitrates	A	0.23 (mg/L)	Nitrites and nitrates are forms of nitrogen that can enter groundwater from land use activities such as septic systems and fertilizers. High concentrations of nitrites and nitrates make water unsafe for human consumption.
Chloride	A	3.805 (mg/L)	Chloride is a form of salt that can enter groundwater through land use activities. Road salt is a source of chloride.

Forest Conditions - Forest cover and forest interior are used to assess forest conditions.

Forest Cover	C	16.7%	Forest cover is the percentage of the total area of the watershed that is covered by trees. It is calculated by using Geographic Information System (GIS) applications. Environment Canada guidelines suggest that at least 30% forest cover in a watershed or region needs to be maintained to sustain a healthy forest ecosystem.
Forest Interior	D	3.06%	Forest Interior refers to wooded areas that are 100 metres from the forest edge, roads or permanent structures. The outer 100 metres of a woodlot is considered edge habitat. Forest interior is extremely important for some wildlife species, especially birds, that require sheltered, undisturbed areas for successful breeding. Much of the forest cover that remains in the Maitland watershed consists of small, fragmented patches. Forest interior is rare making it an important target for preservation and restoration efforts. Environment Canada guidelines suggest that 10% forest interior is required to ensure a healthy forest ecosystem within a watershed or region.
Marginal Land in Production	A	18.4%	The percentage of marginal land in agricultural production was calculated for the watershed. This process involved using provincial soil layer mapping and watershed forest cover information. Marginal lands are usually characterized by poor agriculture conditions such as steep slopes, low lying wet areas or poor soil quality. Marginal lands are often vulnerable to drought, runoff, erosion or flooding. The lower the percentage of marginal land in production the better the report card result.



Climate Change Trends

Although climate change is not a report card indicator, climate trends are expected to have a significant impact on watershed health. Using data gathered for over 30 years the MVCA has identified several local trends:

- A change in precipitation patterns to more isolated, short duration, high intensity rainfalls (more scattered thunderstorms).
- Less winter precipitation is falling as snow and more as rain. Less snow often means less water storage. This will reduce stream flow in summer and fall and produce higher flows in spring and winter.
- The potential for flooding and erosion is increasing across the watershed.
- The risk of bluff and gully erosion along the Lake Huron shoreline is also increasing.

It will be extremely important for rural landowners and farmers to build the resiliency (the ability to cope with changing extremes of drought and

intense rainfall) of their land. Consider your experiences with drought and heavy rainfall and imagine what it would mean if these extremes become common each season. Across the watershed there is a need for more natural infrastructure - forested areas, buffer strips, windbreaks, wetlands - to help protect land from the extremes of heat, wind and runoff.

The MVCA will continue to monitor climate data to develop a more comprehensive understanding of how emerging climate trends are impacting the watershed. The MVCA is also working to help landowners and municipalities cope with climate change. Staff are assisting landowners to create Soil and Water Environmental Enhancement Plans that focus on their entire property. SWEEP activities may include the implementation of riparian buffers, planting windbreaks, retiring fragile lands and the development of rural stormwater management plans.

Looking Ahead

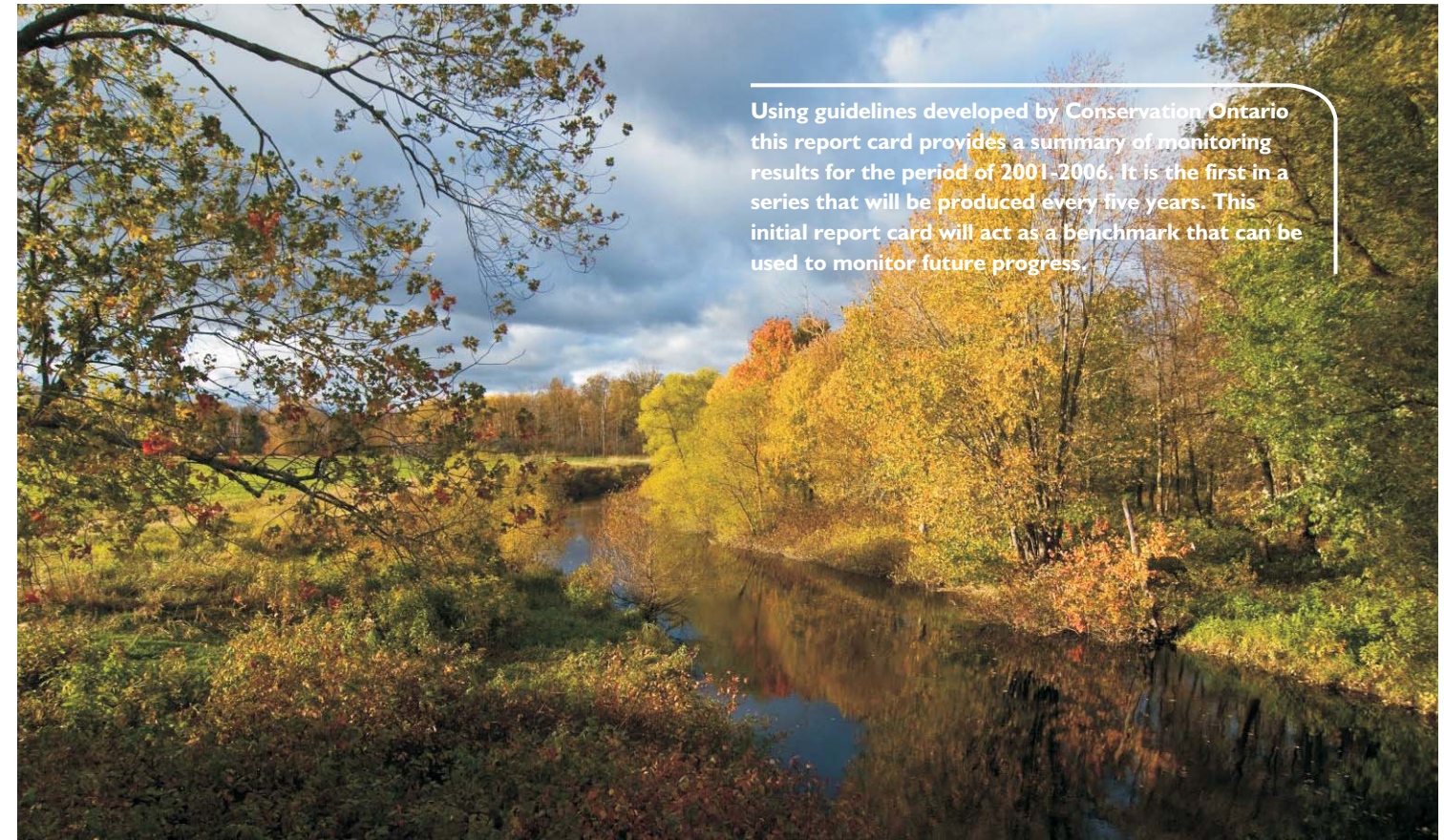
The MVCA will issue a second Watershed Report Card in 2012 covering the period from 2007 to 2011. Continued monitoring and refinements to the indicators used will provide a more comprehensive assessment of the health of our water and forests.

Improving Watershed Health

Individual and collective actions will move our watershed forward towards improved health. The MVCA invites watershed residents to take action today. Talk with your neighbours and MVCA staff about what can be done in your community. We want to hear your ideas and share successful approaches to improving the resiliency of the landscape.

- Learn more about local climate change trends
- Plant trees and create watercourse buffers
- Protect wetlands and forest cover
- Increase residue cover and organic matter on fields. Even a 1% increase in organic matter has a significant impact on the amount of rainfall soil can absorb
- Investigate appropriate rural stormwater management for your property
- Maintain your septic system

The MVCA has information on key activities to improve watershed health on the My Land, Our Water website. This site is a mapping application that enables you to view information about your property including soil, slope, wells and geology. In addition, you can learn about the vulnerability of your property to surface and groundwater contamination.
<http://myland.mvca.on.ca>



Using guidelines developed by Conservation Ontario this report card provides a summary of monitoring results for the period of 2001-2006. It is the first in a series that will be produced every five years. This initial report card will act as a benchmark that can be used to monitor future progress.

Watershed Report Card

This Watershed Report Card provides information on the health of the Maitland watershed. It is a summary of the monitoring work being done by the Maitland Valley Conservation Authority (MVCA) to assess surface and groundwater quality and forest conditions across the Maitland valley. Report Cards outlining conditions in each of the Maitland's major sub-basins are also available.



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General Watershed Results

