GLOSSARY

Aquifer: an underground area of porous, permeable soil or rock that contains a sufficient amount of water to support a domestic well. Shallow aquifers exist in the overburden, the sedimentary rock and soil above bedrock, whereas bedrock aquifers are found in the bedrock itself, beneath whatever overburden is present.

Sinkhole: any depression in the surface of the ground, with or without collapse of the surrounding soil or rock, which provides a means through which surface water can enter the ground and therefore come in contact with groundwater. Sinkholes often allow this contact to occur quite rapidly and do little to filter any contaminants the surface water may contain.

Runoff: water that moves over land rather than being absorbed into the ground. Runoff is greatest after heavy rains or snowmelts, and can pick up and transport contaminants from landfills, farms, sewers, industry and other sources.

Spillway: the valley that results when glacial meltwater cuts into the landscape. Spillways are often composed of sand and gravel.

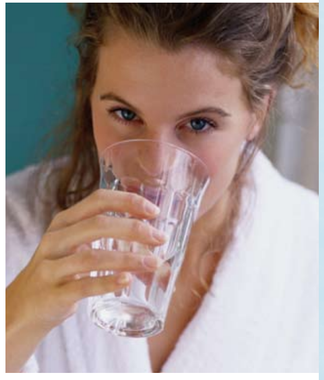
Contamination: the mixing of harmful elements, compounds or microorganisms with surface or groundwater. Contamination can occur naturally (e.g. an aquifer flowing through mineral deposits that contain heavy metals) or through human activity (e.g. sewer water flowing into a river). Nutrients, such as nitrogen and phosphorus, can also cause water contamination when they are present in excessive amounts.

Percolation: the downward movement of water from the surface of the ground through porous soil and cracked or loosely-packed rock.

Diversions of the Ausable River

The Ausable River has two diversions. The first, The Cut, was dug in the 1870s. This channel south of Pinery Provincial Park bypassed the original loop through Grand Bend and drained shallow lagoons in the Thedford Marsh. In 1892, the second diversion routed Parkhill Creek, the remaining flow in the loop, straight west to Lake Huron at Grand Bend. The two diversions isolated the Pinery's portion of the original Ausable (the Old Ausable Channel), restricting it to local drainage.

Cold water: water with a temperature of approximately 14˚C. This thermal habitat is typically considered ideal for brook and brown trout.



It is more cost-effective to protect sources of water than to rely on expensive treatment systems.

SOURCE PROTECTION PLANNING

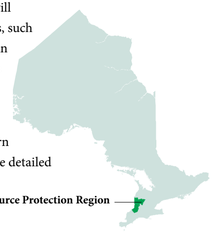
Why? Water is critical to all aspects of our lives. Protecting the sources of our water is important to ensure that there is enough safe water for all our uses – now and in the future.

What? Source protection is simply protecting water resources, such as lakes, rivers and groundwater, from contamination or overuse. The provincial government has passed the Clean Water Act and combined Ontario's watersheds into Source Protection Regions. These Source Protection Regions are in the process of developing Source Protection Plans for municipal sources of drinking water. Each plan will be a management strategy designed to minimize the impact that human and natural activities have on the quality and supply of our water resources. Each plan will develop understanding of the water quantity, quality, processes, threats and possible solutions for the watersheds in the region using an interdisciplinary approach.

When? The planning process is already underway. This process involves developing a Terms of Reference, an Assessment Report and lastly Source Protection Plans. Source Protection Plans are expected to be complete by 2012.

Who? The plans are being developed by Source Protection Committees. Conservation Authorities, agencies experienced in watershed planning and user needs, are assisting Source Protection Committees in this process. Plan success will depend on input by the public and other stakeholders, such as municipalities. Watershed residents — today and in future generations — will be the plans' beneficiaries and implementers.

Where? The Ausable Bayfield Maitland Valley Source Protection Region is located in southwestern Ontario along the Lake Huron shore. Please see the detailed watershed map inside this brochure.



Ausable Bayfield Maitland Valley Source Protection Region

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Ausable Bayfield Maitland Valley Source Protection Region

Member of Conservation Ontario

Ontario

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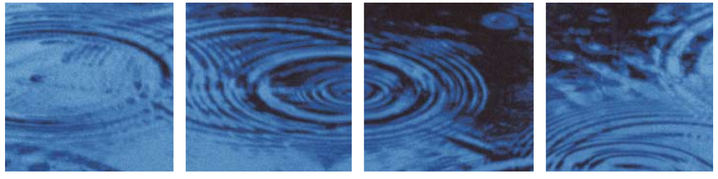
PROTECTING OUR WATER



DRINKING WATER SOURCE PROTECTION PLANNING AND YOU

WATERSHED DESCRIPTION

AUSABLE BAYFIELD MAITLAND VALLEY SOURCE PROTECTION REGION

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Ausable Bayfield Maitland Valley Source Protection Region

WHAT IS SOURCE PROTECTION FOR DRINKING WATER?

Drinking Water Source Protection is the protection of municipal drinking water supplies from contamination or overuse. All the water we use, whether obtained from private wells or public drinking water systems, has a surface source, such as a lake, or a groundwater source, such as an aquifer. Drinking Water Source protection represents a cost-efficient, community-based method of ensuring that the water we drink and use in our daily lives remains safe and contaminant-free, both now and in the future.

Source Protection (SP) Planning is an initiative that is underway with the goals of learning more about our water and developing strategies to protect it. Locally this process is being facilitated by the Source Protection Committee and the Ausable Bayfield and Maitland Valley Conservation Authorities and involves many partners, stakeholders and residents.

To protect water quality and use water wisely, we must understand our ecological neighbourhood, i.e., our watershed.

A watershed is the land that is drained by one river or stream and its tributaries.
As a raindrop flows across fields, forests and towns and as it joins others in the river, nature, including humans, affects it in many interconnected ways. Each watershed is unique with different features and concerns.

INTRODUCTION TO BROCHURE SERIES

This brochure is the first in a series that summarizes the SP Watershed Characterization report. Conservation Authority technical staff and resource experts have produced this report to develop an understanding of the watersheds' physical, sociological and economic characteristics. This information will assist with development of the SP Plan for the area.

The Ausable Bayfield Maitland Valley Source Protection Region

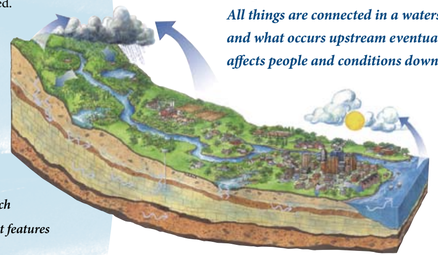
The Ausable Bayfield Maitland Valley Source Protection Region has a population of approximately 100,000. The area is predominantly rural in nature, with a very low average population density of 0.18 persons per hectare. In 2001, Huron County — one of six counties with land in the local watersheds and the county comprising the largest percentage of the Source Protection Region — consisted of 60% rural residents, representing the highest percentage among counties in southwestern Ontario. While Huron County's population grew during the second half of the twentieth century, its farm population decreased from 46% to 18%, as the tourism and manufacturing industries developed.

The Maitland watershed consists of approximately 80% agricultural land and only 2% urban areas. The remainder is made up of natural areas, such as forests and wetlands. The Nine Mile River watershed has the highest amount of forest coverage of the planning region at 30.7%, whereas the Ausable watershed contains 20%, the Maitland 16.5%, and the Bayfield 10%.

Approximately half the residents of the Source Protection Region derive their drinking water from municipal well systems, while the other half rely on private wells. This makes it particularly important that Source Protection Planning involves both urban and rural residents, and with private wells being so common, rural landowners will play a key role in protecting surface water and groundwater.

Sample of a Watershed

All things are connected in a watershed and what occurs upstream eventually affects people and conditions downstream.



Graphic courtesy of Conservation Ontario

Shore Gullies and Streams

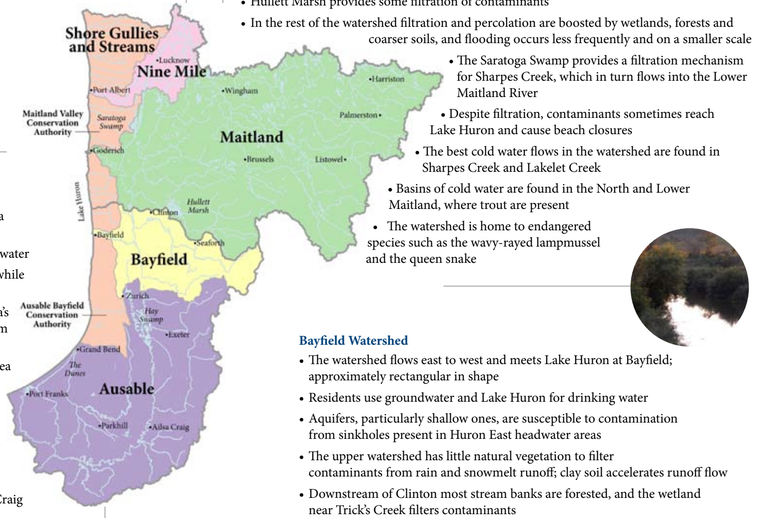
- Numerous short streams flow into Lake Huron between Grand Bend and the Eighteen Mile River
- Most streams are parallel and 6 to 8 km long
- Most residents in the area draw water from a combination of Lake Huron and deep bedrock wells
- The streams' clay soils, straightened channels and steep near-shore gradients increase the pace of storm runoff
- Nutrients and bacteria can potentially escape from faulty or inadequate septic systems and area farms
- Vegetation is too sparse to provide adequate filtration
- Notable exceptions are Boundary and Gully Creeks, which have more forest cover and reach coarse glacial deposits rich in groundwater
- Gully Creek's waters are cold enough for more fish species
- Boundary Creek is filtered by a portion of the Saratoga wetland; no other wetlands exist in this watershed
- Near-shore and offshore waters of this unit supply commercial fisheries based in Grand Bend, Bayfield and St. Joseph with Whitefish and Yellow Perch
- Sport fisheries focus on yellow perch, rainbow trout, brown trout and Chinook salmon
- Natural erosion occurs at the shore cliffs, the sediment from which washes south and reinforces the dune system beyond Grand Bend
- The area's septic systems are facing higher demand due to the conversion of cottages to permanent residences
- Clay soils are insufficient for filtration of septage contaminants which can quickly reach the Lake Huron shore

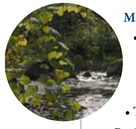
Nine Mile Watershed

- The watershed is wide and rectangular in its upper region, and narrow at Port Albert where it outlets into Lake Huron
- Residents use groundwater for drinking water
- Bedrock aquifers in the area are protected by deep overburden and clay deposits above the aquifers
- Most wells draw from a bedrock aquifer, though some draw from layers of sand and gravel in the ample overburden
- Shallow aquifers are more vulnerable to contamination
- The Nine Mile River is in excellent condition, largely due to the clear, cold groundwater released by shallow aquifers into the river
- The watershed also has the most forest coverage in the planning region, and its woodlands reduce contamination from runoff
- Small wetlands in the upper watershed provide filtration
- Flooding is occasional and occurs at the juncture of several streams at Lucknow, and where ice jams at Port Albert
- An important trout sport fishery exists in the Nine Mile River

Ausable Watershed

- Includes the Ausable River, Parkhill Creek, Mud Creek and dune area watersheds in a broad 'J' shape
- Residents in the area use groundwater and Lake Huron for drinking water
- Bedrock aquifers tend to be protected by deep overburden deposits while shallow aquifers are more susceptible to contamination
- Sinkholes are present in the West Perth headwater areas, and the area's stream-feeding shallow aquifers are vulnerable to contamination from surface water
- Hay Swamp is the only major remaining natural wetland filtration area
- Runoff can collect bacteria and nutrients from the numerous farms in the area
- The forest in the Ausable Gorge helps prevent erosion
- The fragile dune network beyond Highway 21 contains much of the last Old Savannah woodland in North America
- Few cold water streams exist in the watershed; cold water is partially present in Black Creek, Nairn Creek, and a tributary north of Ailsa Craig
- The watershed features 83 fish species, including rainbow trout, smallmouth bass, largemouth bass, yellow perch and northern pike
- The watershed features 24 species of freshwater mussels
- Although the area supports less wildlife than before, it remains a stopping point for tundra swans and other migratory waterfowl in early spring
- The Ausable River is one of the most biologically diverse basins of its size in Canada and contains 14 species listed by the Committee on the Status of Endangered Wildlife in Canada, such as the pugnose shiner fish and the Eastern spiny softshell turtle





Maitland Watershed

- The largest of the five watershed units; includes the South, Middle and Little Maitland tributaries
- The main stem of the Maitland River is divided into the North and Lower Maitland Rivers and empties into Lake Huron at Goderich
- The watershed has the most livestock manure in Canada (7,610kg/hectare)
- Residents use groundwater and Lake Huron for drinking water
- Bedrock aquifers tend to be protected by deep overburden deposits while shallow aquifers are more susceptible to contamination
- The presence of sinkholes makes shallow, vulnerable aquifers in areas near Brussels susceptible to contamination
- Flooding sometimes occurs in the flatlands of the South and Middle Maitland watersheds, where clay soil and a lack of natural vegetation combine to speed runoff
- Hullett Marsh provides some filtration of contaminants
- In the rest of the watershed filtration and percolation are boosted by wetlands, forests and coarser soils, and flooding occurs less frequently and on a smaller scale
- The Saratoga Swamp provides a filtration mechanism for Sharpes Creek, which in turn flows into the Lower Maitland River
- Despite filtration, contaminants sometimes reach Lake Huron and cause beach closures
- The best cold water flows in the watershed are found in Sharpes Creek and Lakelet Creek
- Basins of cold water are found in the North and Lower Maitland, where trout are present
- The watershed is home to endangered species such as the wavy-rayed lampmussel and the queen snake

Bayfield Watershed

- The watershed flows east to west and meets Lake Huron at Bayfield; approximately rectangular in shape
- Residents use groundwater and Lake Huron for drinking water
- Aquifers, particularly shallow ones, are susceptible to contamination from sinkholes present in Huron East headwater areas
- The upper watershed has little natural vegetation to filter contaminants from rain and snowmelt runoff; clay soil accelerates runoff flow
- Downstream of Clinton most stream banks are forested, and the wetland near Trick's Creek filters contaminants
- Trick's and Bannockburn Creeks gain water from shallow aquifers that raise the water quality of Bayfield River, and support a trout population
- The lower Bayfield Valley gorge supports a large, rich forest, which represents a valuable legacy of pre-settlement ecosystems
- 34 fish species are present in the Bayfield watershed
- The watershed provides habitat for 21 rare species, including the lake chubsucker, Northern brook lamprey and Louisiana waterthrush
- Trick's Creek contains some of the best cold water habitat in the watershed