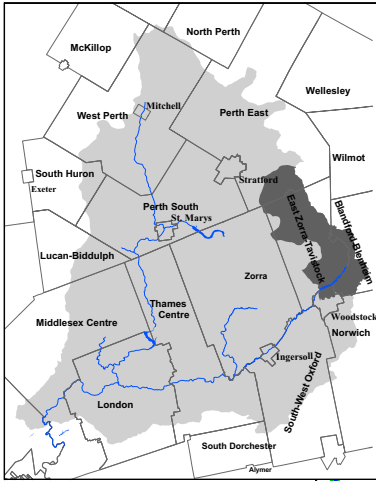


North Woodstock Watershed Report Card

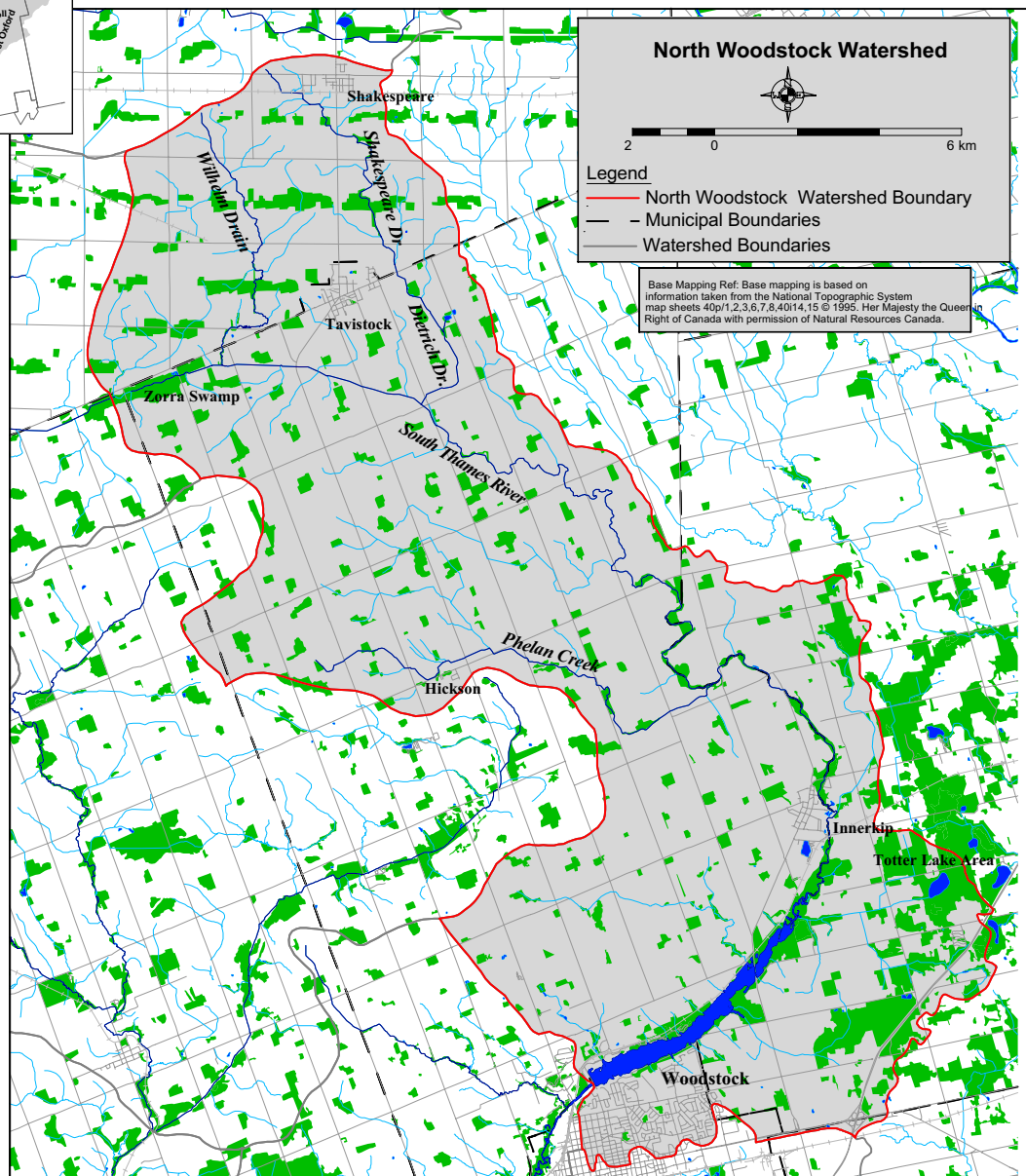


This report card outlines environmental information for the North Woodstock watershed. This watershed is graded against 27 other subwatersheds within the Upper Thames River watershed. The information provides a description of forest and water parameters and ideas for local action to assist agency staff, municipalities and interested parties working for the protection of local forest and water resources. These report cards are part of a larger report titled *The Upper Thames River Watershed Report Cards* (UTRCA, 2001) that is posted on the Upper Thames River Conservation Authority (UTRCA) web site. (See back)

Grades:

D Forest Conditions

C Surface Water Quality



Municipalities: East Zorra-Tavistock (149 sq. km), Blandford-Blenheim (49 sq. km), Perth East (43 sq. km), City of Woodstock (8 sq. km), Zorra (1 sq. km)

Watercourses: South Thames River (headwaters), Witholm Drain, Shakespeare Drain, Dietrick Drain, Phelan Creek ©UTRCA 2001

Grade
D

Forest Conditions

Overall, forest conditions in the North Woodstock watershed score a D grade and the three indicators have scores from C to D (see table below). The amount of forest cover (13%) is about average for the Upper Thames watershed, but still considered too low for sustainability. The ideal for southern Ontario is 25-30% natural cover (Carolinian Canada, 2000). Forest density is fairly poor indicating most woodlots are isolated

from each other making it difficult for seeds to be transported and animals to move between them. The amount of forest interior is slightly better than the Upper Thames average, meaning there are several large woodlots providing habitat for sensitive species that need to live in large protected forests. However, the majority (72%) of the woodlots are small and narrow and do not provide this function.

Indicators	North Woodstock Results		Upper Thames Watershed Average		Indicator Description
	Value	Grade	Value	Grade	
Forest Cover	13%	D	12%	D	Forest cover is the percentage of the watershed that is forested. It is believed there should be 25-30% natural cover in southern Ontario's landscape to sustain our native plants and animals.
Forest Density	64%	D	55%	D	Forest density is a measure of how close woodlots are to each other. Woodlots that are near several other woodlots tend to have greater species diversity than those that are isolated. The movement of seeds and animals between woodlots ensures a healthy gene pool.
Forest Interior	2.0%	C	1.8%	D	Forest interior refers to the protected core area found inside a woodlot that some bird species require to nest and breed successfully. The outer 100m perimeter of a woodlot is considered 'edge' habitat and prone to high predation, alien species invasion, sun and wind damage, etc.

Local Actions Needed for Improvement:

- Protection of all woodlands and locally significant wetlands at the municipal planning level is a very important and effective method of preserving local forest cover. This goal can be achieved through designations in Official Plans, enforcement of tree cutting by-laws, protective zoning and other appropriate planning measures.
- Woodlot owners can improve the health of their woodlots, by preparing and following Woodlot Management Plans.
- Forest interior can be increased by “bulking up” woodlots to make them larger and rounder by planting native trees and shrubs around existing woodlots or allowing the edges to naturalize on their own (e.g. retire land near woodlot edges).
- Connections can be made between woodlots and other habitats by planting hedgerows and windbreaks along fields, water courses and roads.
- To increase natural plant cover in urban areas, target the naturalization of school yards, manicured public parks and open spaces, river valleys, residential and industrial/commercial properties.
- The Trotter's Lake area as it is part of a large wetland/woodland complex that spans the Thames/Grand watershed divide and has the greatest potential for wildlife. Wildlife enhancement projects

should be targeted here to ensure it remains significant. Zorra Swamp is the second most significant site as it forms the headwaters of the South Thames and Trout Creek and should also be the target of inventory and wildlife enhancement projects.

- With landowner cooperation, inventory work should be conducted in the other significant natural areas and wetlands in this watershed to determine their management and securement needs.
- The sizeable 'back 40' woodlots between Shakespeare and Tavistock could serve as a model for farm woodlot management (e.g. good connected woodlots, good width, etc.)



Small woodlots

Grade
C

Surface Water Quality

Overall water quality for North Woodstock watershed ranks a C with the four indicators ranging from B to D (see chart below). Stream health is poorest at the top end of the watershed but improves as water moves downstream. Total phosphorous concentrations have been above the recommended Ministry of the Environment guideline since the 1960s, indicating inputs from sources such as soaps/detergents, fertilizers, pesticides, and soil erosion. Pittock Lake has had a history

of beach closures due to elevated bacteria levels. However, over the past few years there has been a significant drop in bacteria concentrations (about 75%) at the beach. This change has resulted, in part, from continued improvements to waste/manure management in the watershed. There have been 24 spills reported in the North Woodstock subwatershed since 1988, including industrial (City of Woodstock), municipal and agricultural.

Indicators	North Woodstock Results		Upper Thames Watershed Average		Provincial Guideline	Indicator Description
Benthic Score (FBI)	5.15	C	5.66	C	---	Benthic organisms are the aquatic invertebrates that live in stream sediments and are a good indicator of water quality and stream health. The 'Family Biotic Index' (FBI) scores each species according to its pollution tolerance.
Phosphorus (mg/l)	0.09*	D	0.08*	D	0.03 (Provincial Objective)	Phosphorus is found in such products as soaps, detergents, fertilizers and pesticides, and contributes to excess algae and low oxygen in streams and lakes.
Bacteria (per 100 ml)	108*	B	304*	C	100 (Recreational Swimming Guideline)	Fecal coliform bacteria are found in human and animal waste and their presence in water indicates fecal contamination. Fecal coliform bacteria are a strong indicator for the potential to have other disease-causing organisms in the water.
Conductivity (μS/cm)	639*	D	642*	D	---	Conductivity is a measure of water's ability to conduct an electrical current and is an indicator of the level of dissolved solids and pollutants in water.

*10 year average concentration, 1990-2000 (Ministry of the Environment data)

Local Actions Needed for Improvement:

- Plant buffers (grassed or treed) along creeks, rivers and open drains to filter runoff and provide shade. Target the rehabilitation of the six coldwater tributaries.
- Implement protection of identified groundwater infiltration zones and continue with groundwater research and monitoring (refer to *Oxford County Groundwater Study, 2000* and *Perth County Groundwater Study, 2001*).
- Encourage the decommissioning of abandoned wells according to Ministry of the Environment standards.
- Address the high number of spills in this watershed through education, regulation, and improved response.
- Encourage environmentally sustainable practices on golf courses (e.g. Audubon Cooperative Sanctuary Program).
- Encourage drain maintenance and design procedures that protect water quality (e.g. careful timing, proper use of silt traps, maintaining existing vegetation where possible, use of natural channel design principles).
- The following actions should be targeted within urban areas:
 - upgrade sewer systems where risk of contamination is greatest (e.g. combined sanitary/storm sewers), extend sanitary sewers to urban properties on septic systems, and repair or replace faulty existing septic systems;
 - implement stormwater management plans for new urban developments and implement projects to reduce stormwater runoff (e.g. infiltration ponds, pavement alternatives, etc.);
 - encourage river clean-up/stream stewardship projects to improve stream habitat; and
 - educate residents regarding urban Best Management Practices such as reduction and proper use of pesticides and fertilizers and proper household hazardous waste disposal.

(continued on back)

- The following actions should be targeted in rural areas:
 - encourage landowners to repair or replace faulty septic systems;
 - encourage agricultural Best Management Practices in the areas of manure storage and spreading, soil conservation

practices, fertilizer and pesticide storage and application, fuel storage, milkhouse washwater disposal, and cattle access restriction; and

- promote the completion of Environmental Farm Plans and Nutrient Management Plans.



North Woodstock Watershed Features

Area	250 sq. km (7% of Upper Thames River watershed)
Land Use	80% agriculture, 13% wooded, 6% urban, 1% water (GIS derived using OMAFRA Landuse Systems, 1983)
Soil Type	48% silt loam, 22% sandy loam, 12% clay loam, 5% loamy sand, 4% loam, 2% organic/muck, 2% bottomland, and 5% not mapped (urban) (GIS derived using county soils maps)
Soil Erosion/Delivery	15% of the watershed is classified as highly erodible, meaning lands that contribute over 7 tonnes/ha of soil to a watercourse per year. The average for the Upper Thames River watershed is 9% (GIS derived using 1991 Geomatics data).
Physiography	44% drumlinized till plain, 16% undrumlinized till plain, 15% spillway, 13% clay plain, 7% till moraine, 3% drumlins, 2% eskers (Chapman and Putnam, 1984)
Stream Flow	2.9 cubic metres/sec is the annual mean flow on the South Thames at Woodstock. This watershed contributes approximately 7% of the flow in the Thames River downstream of London. (Environment Canada, 1998)
Groundwater	There is a significant shallow overburden aquifer (less than 18 m) located around Pittock Reservoir extending northwest to Innerkip. (MOE 1981)
Fishery Resources	22 species of fish have been recorded including Largemouth Bass. There are six coldwater streams in this watershed, some of which serve as nursery areas for gamefish. (UTRCA and DFO, 2000)
Dams	The Pittock dam in Woodstock is the only recorded dam in the watershed. (UTRCA, 1991)
Sewage Treatment	The Tavistock Wastewater Treatment Plant discharges treated effluent to the Thames River via Horner Drain. Woodstock is serviced by the Woodstock Water Pollution Control Plant that discharges to the Thames River just downstream of this watershed. Rural properties are serviced by septic systems.
Woodlot Size	44% of the woodlots are very small (<4 ha), 28% are small (4-10 ha), 16% are mid-sized (10-30 ha), 1% are large (30-40 ha) and 12% are large (> 40 ha). (GIS derived using 1997 NTS maps)
Riparian Forest	25% of the riparian zone (20 m on either side of all watercourses) is forested. The average for the Upper Thames River watershed is 24%. (GIS derived using 1997 NTS maps)
Rare Species	Fish – Greenside Darter Reptiles – Eastern Hognose Snake Plants – Ram’s-head Lady’s Slipper (NHIC 2000)
Significant Natural Sites	Provincially Significant Wetlands – Pittock Park and Reservoir, Trotters Lake/Vansittart Woods Complex Locally Significant Wetlands – Zorra Swamp, Eastwood Wetland, ZT26B Wetland, BB2D Wetland Significant Natural Areas – County Forest, Fowlers Pond, Maple Woodlot, Thames River Valley Earth Science Areas of Natural and Scientific Interest – Innerkip Quarry (MNR and UTRCA 1996)

References: For a complete listing of references, see the full report: *The Upper Thames River Watershed Report Cards* (UTRCA, 2001).