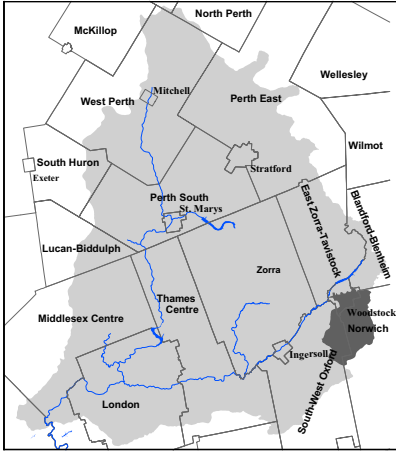




Cedar Creek Watershed Report Card

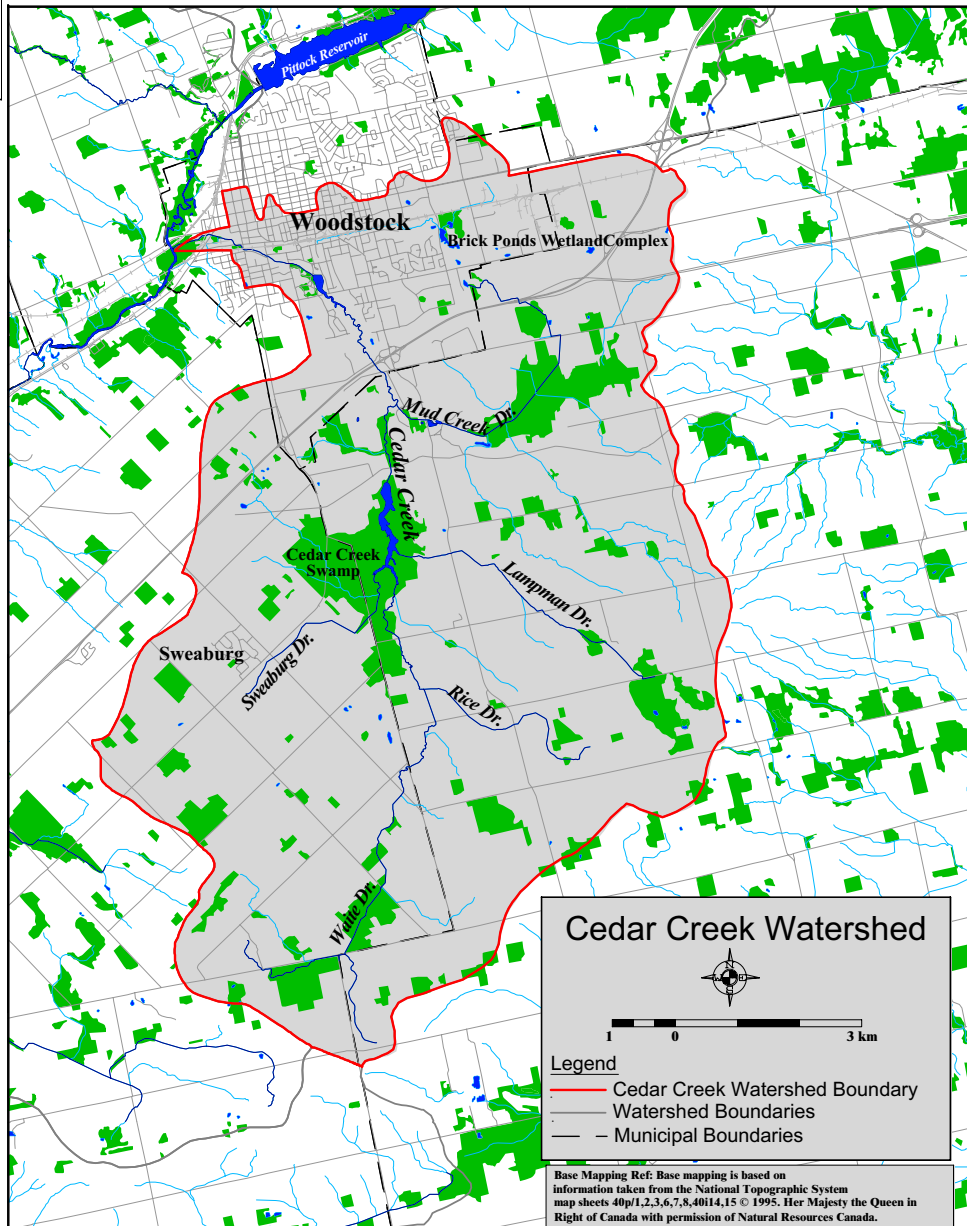


This report card outlines environmental information for the Cedar Creek watershed. This watershed is graded against 27 other subwatersheds within the Upper Thames River watershed. The information provides a description of forest and water parameters and ideas for local action to assist agency staff, 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

D Surface Water Quality



Municipalities: Norwich Township (52 sq. km), South-West Oxford (32 sq. km), Woodstock (13 sq. km)
Watercourses: Cedar Creek, Mud Creek Drain, Lampman Drain, Sweaburg Drain, Waite Drain



Grade
D

Forest Conditions

Overall, forest conditions in the Cedar Creek watershed score a D grade but the three indicators have grades that range widely from A to F (see table below). The amount of forest cover (12%) is 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 very low indicating that

most of the woodlots are isolated from each other making it very difficult for seeds to be transported and animals to move between them. Forest interior, however, is quite good, suggesting that most or some woodlots are big enough to support sensitive species that need to live in large protected forests. This value is somewhat skewed by the fact that the Cedar Creek watershed is small compared to others in the Upper Thames.

Indicators	Cedar Creek Results		Upper Thames Watershed Average		Indicator Description
Forest Cover	12%	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	30%	F	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	3.3%	A	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 woodlots 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.
- Connections can be made between woodlots and other habitats by planting hedgerows and windbreaks along fields, roads and watercourses.
- Woodlot owners can maintain and 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).
- With landowner cooperation, strategies should be put in place to address the protection and management needs of the significant natural areas.
- Natural vegetation cover can be increased in urban areas by targeting the naturalization of school yards, manicured public parks and open spaces, river valleys, residential and industrial/commercial properties.
- Educate landowners living next to natural areas on ways to minimize their impacts on these sensitive lands (e.g. cutting and dumping) and develop a watershed-wide encroachment strategy.
- The Cedar Creek watershed has had a focused community effort since 1996 with the goal to improve the health of the watershed while educating and involving the community. *The Cedar Creek Management Strategy* (UTRCA 1998) and *The Cedar Creek Watershed Enhancement Plan* (UTRCA 1998) summarize the community's efforts. Recommendations include:
 - target woodlot enhancement work around Cedar Creek Swamp, the most significant wildlife area;
 - continue to educate watershed residents about natural area protection (e.g. see *Protecting Natural Areas in the City of Woodstock* and *Naturalization - Bringing Nature Back*); and
 - retire city-owned agricultural lands around Brick Ponds Wetland Complex and allow the area to naturalize.

Grade
D

Surface Water Quality

The Cedar Creek watershed ranks a D for surface water quality with the four water quality indicators all rating a D (see chart below). Water quality is generally better in the headwaters and poorer downstream of Hodge's Pond with further degradation through the City of Woodstock. Some contributing factors at the downstream end include bank erosion, low vegetation cover, and impacts of urban runoff. Fecal coliform

bacteria levels have remained high over the past 20 years indicating continuous inputs of contamination from human and/or animal waste. Phosphorus and nitrate concentrations have been increasing over the past 20 years indicating nutrient inputs from fertilizers, detergents, eroded soil and other urban and rural runoff. There have been 11 spills reported in the Cedar Creek watershed since 1988.

Indicators	Cedar Creek Results		Upper Thames Watershed Average		Provincial Guideline	Indicator Description
Benthic Score (FBI)	5.75	D	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)	0.08*	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)	638*	D	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)	656*	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:

- *The Cedar Creek Management Strategy* (UTRCA 1998) and *The Cedar Creek Enhancement Plan* (UTRCA 1998) recommend the following:
 - initiate baseline environmental monitoring at Brick Ponds to determine the effects of local development (as stated in the *Oxford County Official Plan*); and
 - continue to educate local school children and the public on groundwater protection (eg. through the Children's Groundwater Festival).
- Plant buffers (grassed or treed) along creeks, rivers and open drains to filter runoff and provide shade. Target the rehabilitation of the two coldwater tributaries.
- Implement protection of identified groundwater recharge zones and discharge areas, and continue with groundwater research and monitoring (refer to *Oxford County Groundwater Study*, 2000).
- Encourage the proper decommissioning of abandoned wells according to Ministry of the Environment standards.
- Investigate impacts of aggregate extraction on surface and groundwater.
- Assess the purpose of each dam to determine if any should be removed or modified to improve river health. Continue with the Hodge's Pond monitoring and dam review to establish alternatives for the dam.
- Encourage environmentally sustainable practices on golf courses (e.g. Audubon Cooperative Sanctuary Program).
- Encourage drain maintenance and design procedures that protect water quality (eg. careful timing, proper use of silt traps, maintaining existing vegetation, use of natural channel design principles).
- Target soil erosion measures to areas of high erodibility (16% of the land within this watershed is classified as highly erodible compared to Upper Thames River watershed average of 9%).
- Target the following actions in 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

(continued on back)

- runoff (e.g. infiltration ponds, pavement alternatives, etc);
- encourage river clean-up /stream stewardship projects to improve stream habitat; and
- educate urban residents regarding Urban Best Management Practices such as reduction and proper use of pesticides and fertilizers, and proper household hazardous waste disposal.
- 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.



Cedar Creek Watershed Features

Area	98 sq. km (3% of Upper Thames River watershed)
Land Use	73% agriculture, 14% urban, 12% wooded, 1% quarry (GIS derived using OMAFRA Landuse Systems, 1983)
Soil Type	45% silt loam, 20% clay loam, 14% sandy loam, 4% loam, 3% organic, 14% not mapped (urban) (GIS derived using county soil maps)
Soil Erosion/Delivery	16% 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	35% spillway, 29% till moraine, 27% drumlinized till plain, 9% drumlins (Chapman and Putnam, 1984.)
Stream Flow	1 cubic metre/sec is the mean annual flow on Cedar Creek in Woodstock. This contributes approximately 3% of the flow in the Thames River downstream of London.
Groundwater	Both shallow (< 18 m) and intermediate (18 - 45m) aquifers are found throughout the watershed. (MOE 1981). The City of Woodstock's water supply comes almost entirely from nearby wells — seven in the Cedar Creek Swamp area and four in the city itself.
Fishery Resources	17 species of fish have been recorded including Rock Bass. There are two coldwater streams, one of particularly high quality that originates from Cedar Creek Swamp. Flow fluctuations as a result of Woodstock's wells in the Cedar Creek Swamp may impact the success of trout in this stream. (UTRCA and DFO, 2000)
Dams	There are two dams on watercourses in this watershed: Hodge's Pond Dam (Norwich Twp) and Southside Dam (City of Woodstock). (UTRCA, 1991).
Sewage Treatment	There are no sewage treatment plants discharging to Cedar Creek. Rural properties in the watershed are serviced by private septic systems. Properties in Woodstock are serviced by the Woodstock Water Pollution Control Plant that discharge treated effluent to the South Thames River.
Woodlot Size	45% of the woodlots are very small (<4 ha), 17% are small (4-10 ha), 17% are mid-sized (10-30 ha), 4% are large (30-40 ha) and 17% are very large (>40 ha) (GIS derived using 1997 NTS maps).
Riparian Forest	27% of the riparian zone (20 metres 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 Birds – Loggerhead Shrike (ROM data, UTRCA data, and NHIC, 2000)
Significant Natural Sites	Provincially Significant Wetlands – Brick Ponds Wetland Complex, Cedar Creek/Sweaburg Swamp, Oxford Centre Swamp Locally Significant Wetlands – Cedar Creek Source Complex, Jack Griffin's Wetland, Wetland TRT5 Significant Natural Areas – Trillium Woods Nature Reserve (MNR and UTRCA 1996)

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

