



Grade  
F

# Forest Conditions

Overall, forest conditions in the Whirl Creek watershed score an F grade and the three indicators have grades ranging from D- to F (see table below). The amount of forest cover (7%) is the second lowest in the Upper Thames watershed and considered too low for sustainability. The ideal for southern Ontario is 25-30% natural cover (Carolinian Canada, 2000). Forest density is very poor meaning that most of the woodlots are very isolated from each other, making it very difficult for seeds to

be transported and animals to move between them. Most of the woodlots are located in a linear layout along the backs of farms and not randomly clustered. The amount of forest interior is also very low indicating the majority of woodlots are too small and narrow to support sensitive species that need to live in large habitats with significant central areas. Small, isolated woodlots tend to have low species diversity and many non-native plants.

Indicators	Whirl Creek Results		Upper Thames Watershed Average		Indicator Description
	Forest Cover	Forest Density	Forest Interior	Grade	
Forest Cover	7%	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	18%	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	0.7%	F	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, restrictive zoning and other appropriate planning measures.
- 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). Priority should be given to reconnecting neighbouring woodlots.
- Woodlot owners can maintain and improve the health of their woodlots by preparing and following Woodlot Management Plans.
- Whirl Creek Woods, Seabach Hill Woods Wetland and the Brunner Wetland Complex are the most significant wooded sites in the watershed. Protection and enhancement projects should be targeted here to further increase their value. With landowner cooperation, projects could include planting wooded corridors between neighbouring woodlots, examining drainage practices in and around the wetlands, and plantation thinning.
- Connections can be made between woodlots and other habitats by planting hedgerows and windbreaks along fields, roads and watercourses.
- Forest cover along Whirl Creek is very sparse. As a starting point, priority should be given to planting native trees and shrubs along the downstream end of Whirl Creek close to Mitchell to begin to create a corridor of green that would benefit terrestrial and aquatic wildlife.



Small farm woodlot

Grade  
D

# Surface Water Quality

Water quality in the Whirl Creek watershed ranks a D with the four indicators ranging from C to D (see chart below). Poor stream health can be partially attributed to the lack of vegetation cover along the watercourses. In fact, the Whirl Creek subwatershed has the lowest amount of riparian cover in the Upper Thames River Watershed. Bacteria levels are slightly above the average for the Upper Thames River

Watershed indicating on-going contamination from human/animal waste. Phosphorus levels indicate contamination from sources such as soaps/detergents, fertilizers, pesticides, and soil erosion. Current information on fish habitat and populations and stream characteristics (cold versus warmwater, permanent versus intermittent flow) is lacking for this watershed.

Indicators	Whirl Creek Results		Upper Thames Watershed Average		Provincial Guideline	Indicator Description
<b>Benthic Score (FBI)</b>	5.76	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.
<b>Phosphorus (mg/l)</b>	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.
<b>Bacteria (per 100 ml)</b>	407*	C	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.
<b>Conductivity (<math>\mu</math>S/cm)</b>	604*	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 in this area to filter runoff and provide shade. Enhancing vegetative cover is a priority in this watershed. Target the rehabilitation of potential coldwater tributaries.
- Conduct further study on fish habitat and populations and stream characteristics.
- Protect identified groundwater infiltration zones and continue with groundwater research and monitoring (refer to *Perth County Groundwater Study*, 2001).
- Encourage the decommissioning of abandoned wells according to Ministry of the Environment standards.
- Encourage drain maintenance and design procedures that protect water quality (eg. careful timing, proper use of silt traps, maintaining existing vegetation where possible, use of natural channel design principles).
- The following actions should be targeted 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 existing faulty 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 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.

# Whirl Creek Watershed Features

<b>Area</b>	130 sq. km (4% of Upper Thames River watershed)
<b>Land Use</b>	92% agriculture, 7% wooded, 1% urban (GIS derived using OMAFRA Landuse Systems, 1983)
<b>Soil Type</b>	78% clay loam, 14% silt loam, 8% bottomland (GIS derived using county soils maps)
<b>Soil Erosion/Delivery</b>	1% of the watershed is classified as highly erodible which is defined as 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).
<b>Physiography</b>	83% undrumlinized till plain, 17% till moraine (Chapman and Putnam, 1984)
<b>Stream Flow</b>	There are no flow monitoring stations on Whirl Creek.
<b>Groundwater</b>	A shallow overburden aquifer is found in the Kinkora area and follows the channel of Whirl Creek down to its outlet at the Thames River. The rest of the area is supplied by deeper bedrock aquifers. (MOE 1981)
<b>Fishery Resources</b>	19 species of fish have been recorded in this watershed including Smallmouth Bass and Rock Bass. No coldwater streams have been documented in this watershed. (UTRCA and DFO, 2000)
<b>Dams</b>	No dams have been documented in this watershed. (UTRCA, 1991).
<b>Sewage Treatment</b>	There are no sewage treatment plants discharging to Whirl Creek. The Mitchell Wastewater Treatment Plant discharges treated effluent to the North Thames River and services that part of Mitchell that lies within the Whirl Creek watershed. Rural properties in the watershed are serviced by private septic systems.
<b>Woodlot Size</b>	51% of the woodlots are very small (<4 ha), 18% are small (4-10 ha), 26% are mid-sized (10-30 ha), 2% are large (30-40 ha) and 3% are large (> 40 ha). (GIS derived using 1997 NTS maps)
<b>Riparian Forest</b>	7% 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)
<b>Rare Species</b>	Fish – Greenside Darter Plants – Willow Aster (NHIC 2000 and ROM/UTRCA staff)
<b>Significant Natural Sites</b>	<b>Provincially Significant Wetlands</b> – none <b>Locally Significant Wetlands</b> — Seabach Hill Woods, Whirl Creek Woods, Brunner Complex <b>Significant Natural Areas</b> – none <b>Earth Science Areas of Natural and Scientific Interest</b> – Seebach Hill Spillway (MNR and UTRCA 1996)
<b>References:</b>	For a complete listing of references, see the full report: <i>The Upper Thames River Watershed Report Cards</i> (UTRCA, 2001).



Small Perth County woodlots



Greenside Darter