

# Middle East Sydenham

## **SUBWATERSHED**

Report Card 2018



The St. Clair Region Conservation Authority has prepared this series of 14 subwatershed report cards as a summary of the state of the forests, wetlands, and water resources in the St. Clair Region.





# MIDDLE EAST SYDENHAM SURFACE WATER QUALITY

# C GRADE

## Surface Water Quality

Using a provincial grading system, the three surface water quality indicators score one B grade, one C grade, and one D grade, producing an overall grade of C for the Middle East Sydenham subwatershed. Total phosphorus (TP) levels are slightly below the average for the St. Clair Region but are still elevated at four times the provincial guideline. Maintaining TP levels below the Interim Provincial Water Quality Objective is intended to control excessive plant growth in rivers and streams and to protect aquatic life. *Escherichia coli* (*E. coli*) levels are slightly above average for the St. Clair Region and are over twice the provincial guideline for safe recreational use of water, indicating ongoing fecal contamination. The stream health grade measured by sampling benthic invertebrate communities is the best in the St. Clair Region, it suggests that some organic pollution is probable.

## Local Actions to Improve Water Quality

- Develop an Environmental Farm Plan and implement agricultural Best Management Practices;
- Plant and maintain vegetated streamside buffers on one side of municipal drains and along both sides of other watercourses to stabilize the banks, shade the water, and capture nutrients;
- Fix faulty septic systems and establish a septic maintenance plan;
- Create or restore wetlands to trap nutrients, mitigate flooding, and improve habitat;
- Properly store chemicals and dispose of them through household hazardous waste days or drop-off locations.

INDICATOR	MIDDLE EAST SYDENHAM			ST. CLAIR REGION AVERAGE	PROVINCIAL GUIDELINE	INDICATOR DESCRIPTION
	2001-2005	2006-2010	2011-2015	2011-2015		
Total Phosphorus (mg/L)	0.08 D	0.08 D	0.12 D	0.15 D	0.03 B	Phosphorus is found in products such as detergents, fertilizers, and pesticides. Phosphorus contributes to excess algae growth and low oxygen levels in streams and lakes.
Bacteria (CFU <i>E. coli</i> /100ml)	99 B	162 C	234 C	211 C	100 B (recreational use)	<i>Escherichia coli</i> ( <i>E. coli</i> ) bacteria is found in human and animal (e.g., livestock, wildlife) waste. Its presence in water indicates fecal contamination and is a strong indicator that other disease-causing pathogens are present in the watercourse.
Benthic Score (FBI)	5.76 D	5.55 C	4.88 B	5.73 C	<5.00 B (unofficial)	Benthic invertebrates are small animals without backbones that live in stream sediments. The pollution tolerances of taxa present in benthic samples are used to calculate the Family Biotic Index (FBI). The FBI ranges from 0 (excellent water quality) to 10 (very poor water quality).
<b>Overall Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>		



# MIDDLE EAST SYDENHAM FOREST CONDITIONS

# D GRADE

## Forest Conditions

For the Middle East Sydenham subwatershed, the three forest conditions indicators all score a D grade, producing an overall grade of D. The percent forest cover (14.6%) is above the average for the St. Clair Region but is still only half the recommended cover needed to support natural species diversity and water quality. The percent forest interior (2.6%) is above the average for the St. Clair Region but still considered very poor as it is one-quarter of the recommended value. This indicates that most woodlots are too narrow to support area-sensitive species, such as Scarlet Tanager and Ovenbird. The Environment Canada guideline for southern Ontario is 10% forest interior. The percentage of the riparian zone that is forested (26.0%) is slightly above the average for the St. Clair Region though only half the 50% target.

Any changes in forest cover, either from forest loss or reforestation efforts, is visible using aerial photography. Although there have been a significant number of recent tree planting projects in this subwatershed, forests grow slowly, and young trees are not considered to be forests until they are at least 3 m tall and are developing a canopy.

## Local Actions to Improve Forest Conditions

- Establish and enlarge woodlots using a variety of native species to reduce the impact of aggressive insects and extreme weather events on tree health;
- Woodlot owners should prepare and follow Woodlot Management Plans;
- Connect woodlots by planting shelterbelts, windbreaks, and buffers along fields and watercourses to enhance wildlife habitat, protect against soil erosion, and improve water quality.

INDICATOR	MIDDLE EAST SYDENHAM			ST. CLAIR REGION AVERAGE	PROVINCIAL GUIDELINE	INDICATOR DESCRIPTION
	2001-2005	2006-2010	2011-2015	2011-2015		
Percent Forest Cover (%)	14.5 D	14.7 D	14.6 D	12.0 D	30.0 B	Percent forest cover is the percentage of the watershed that is forested. Forests are necessary to produce oxygen, store carbon, and offer many ecological services that are essential to the well-being of both humans and wildlife.
Percent Forest Interior (%)	2.3 F	2.7 D	2.6 D	2.1 F	10.0 B	Percentage of the watershed that is forest interior. Forest interior is the core area inside a woodlot that is more than 100 m from the edge. The outer 100 m is 'edge' habitat and is prone to high predation, sun/wind damage, and alien species invasion.
Percent Forested Riparian Buffer (%)	No data	26.1 D	26.0 D	23.1 D	50.0 B	Percent forested riparian buffer is the percentage of forest cover within a 30 m zone along both sides of all open watercourses. Natural cover in this zone prevents sediment and nutrients from entering the water.
<b>Overall Grade</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>		



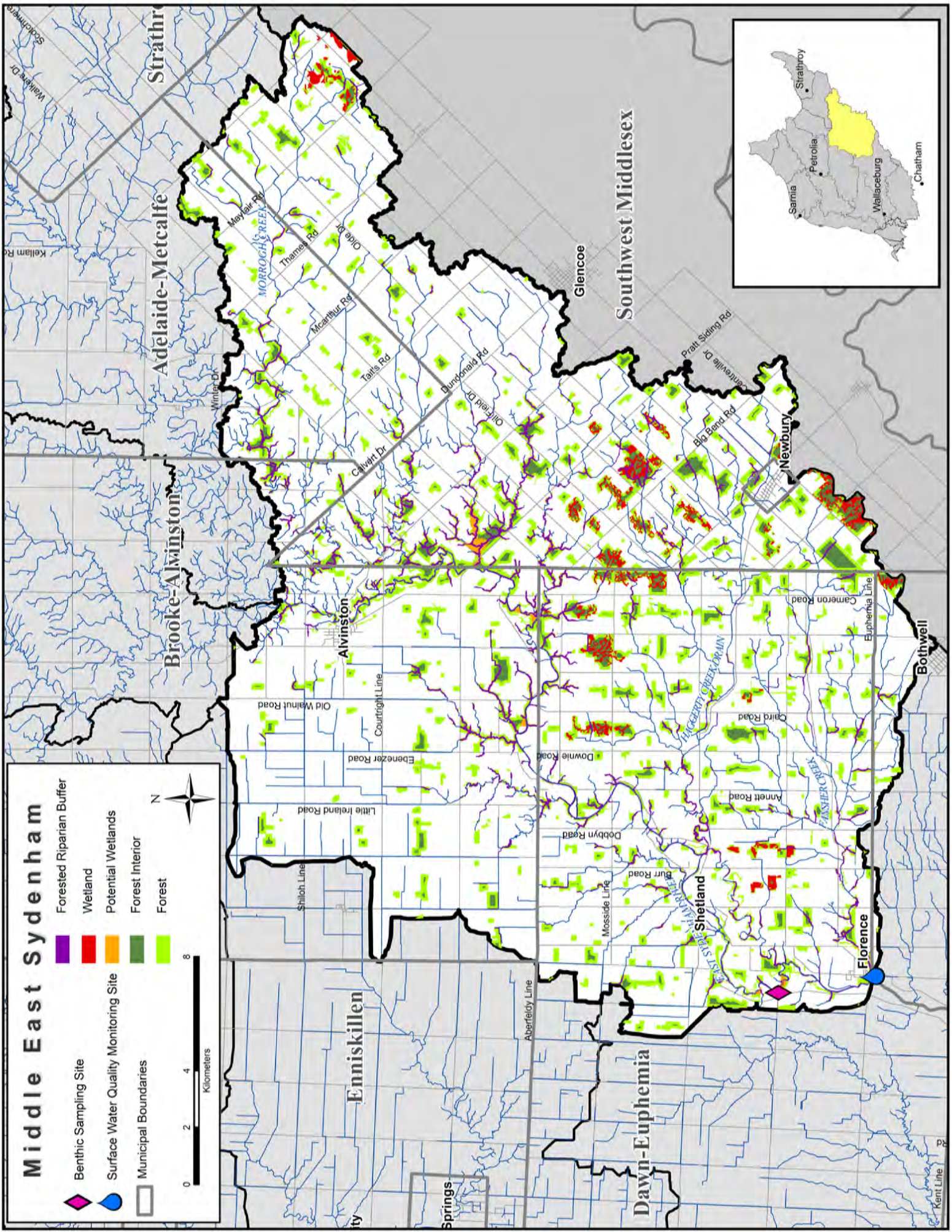
# MIDDLE EAST SYDENHAM WATERSHED FEATURES

Area	538 km <sup>2</sup> , 13.0% of the St. Clair Region watershed
Municipalities	Dawn-Euphemia (181 km <sup>2</sup> , 34%), Southwest Middlesex (165 km <sup>2</sup> , 31%), Brooke-Alvinston (130 km <sup>2</sup> , 24%), Adelaide Metcalfe (51 km <sup>2</sup> , 10%), Chatham-Kent (10 km <sup>2</sup> , 2%), Newbury (2 km <sup>2</sup> , <1%)
Physiography	43% sand plains; 33% clay plains; 24% bevelled till plains
Soil Type	54% silt and clay; 35% sand loams; 5% bottom land and beach; 3% loam; 3% silt and clay loams; 1% not mapped
Streamflow	The mean annual streamflow at the top of this subwatershed was 8.98 m <sup>3</sup> /s, as measured in the Sydenham at Alvinston from 2003 to 2015. During the period from 2011 to 2015, mean annual flows remained above this mean, ranging from 10.66 to 10.93 m <sup>3</sup> /s. At the bottom of this subwatershed, from 2003 to 2015, the mean annual flow at Florence was 9.17 m <sup>3</sup> /s. From 2011 to 2015 average annual flows were well below this mean, ranging from 3.40 to 3.97 m <sup>3</sup> /s. During the previous period, from 2006 to 2010, average annual flows ranged widely around the subwatershed means – at Alvinston flows ranged from 5.10 to 12.30 m <sup>3</sup> /s, and at Florence they ranged from 7.46 to 19.6 m <sup>3</sup> /s.
Precipitation	The average annual precipitation at Strathroy from 2002 to 2015 was 912 mm. From 2011 to 2015, the annual precipitation varied widely around this value ranging from 663 to 1,165 mm. The previous period, 2006 to 2010, was wetter ranging from 804 to 1,241 mm.
Air Temperature	The average annual temperature at Strathroy from 2002 to 2015 was 8.5°C. From 2011 to 2015, average annual temperatures ranged more widely from 6.6 to 10.0°C than during the previous period, 2006 to 2010, which experienced more stable temperatures ranging of 8.1 to 9.4°C.
Tile Drainage	41% not tiled; 18% randomly tiled; 40% systematically tiled
Watercourse Length and Type	Total length: 923 km Watercourse type: 11% natural, 57% municipal drain, 32% unclassified
Dams and Barriers	Three dams, including two public dams within A.W. Campbell CA
Sewage Treatment	Alvinston Wastewater Treatment Plant (WWTP) discharges treated effluent to the East Sydenham River downstream of Alvinston at the beginning of this subwatershed. Newbury WWTP discharges treated effluent to Dolby Drain, part of Haggerty Creek Drain, which joins the East Sydenham River upstream of Shetland. An environmental assessment has been initiated for a municipal treatment system for Florence, at the bottom of the subwatershed.



# MIDDLE EAST SYDENHAM WATERSHED FEATURES

<p>Fisheries Resources</p>	<p>Sixty-eight fish species and 22 freshwater mussel species recorded. Game fish include Northern Pike, Largemouth and Smallmouth Bass, Yellow Perch and Walleye.</p>					
<p>Species at Risk</p>	<p>Birds: Acadian Flycatcher, Bank Swallow, Barn Swallow, Bobolink, Chimney Swift, Eastern Meadowlark, Hooded Warbler, Least Bittern, Prothonotary Warbler, Red-headed Woodpecker, Yellow-breasted Chat</p> <p>Fishes: Brindled Madtom, Eastern Sand Darter, Northern Madtom, Spotted Sucker</p> <p>Mammals: Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis</p> <p>Mulloscs: Eastern Pondmussel, Fawnsfoot, Mapleleaf Mussel, Northern Riffleshell, Rainbow Mussel, Rayed Bean, Round Hickorynut, Round Pigtoe, Salamander Mussel, Snuffbox, Wavy-rayed Lampmussel</p> <p>Plants: American Ginseng, Blue Ash, Butternut, Drooping Trillium, Eastern Flowering Dogwood, Large Whorled Pogonia, Purple Twayblade, Riddell's Goldenrod</p> <p>Reptiles: Gray Ratsnake, Snapping Turtle, Spiny Softshell</p>					
<p>Groundwater</p>	<p>The Bothwell Sand Plain Aquifer is in the overburden in the southern part of this area. It generally has good quality and quantity of groundwater although it is vulnerable to drought and to contamination from surface land uses. The northern area has a deeper aquifer at the interface between the overburden and the bedrock, known as the Fresh Water Aquifer, which is limited in quantity and has elevated chloride. Although the western half of this area is serviced by municipally-piped water from the Great Lakes, the majority of residents still use private wells for domestic and agricultural purposes.</p>					
<p>Wetland Cover</p>	<p>555 ha or 1.0% of the subwatershed is identified as wetlands by the Ministry of Natural Resources and Forestry (MNRF). An additional 96 ha (0.2% of the subwatershed) are identified by the St. Clair Region Conservation Authority (SCRCA) as potential wetlands. Wetlands are vital to the landscape as they reduce flooding and filter water. Environment Canada recommends a minimum of 6% wetland cover at a subwatershed scale.</p>					
<p>Woodlot Size</p>	<p>Size Category</p>	<p>Number of Woodlots</p>	<p>% of Woodlots</p>	<p>Total Woodland Area (ha)</p>	<p>% of Total Woodland Area</p>	<p>Largest Woodlot (ha)</p>
	<p>&lt;5 ha</p>	<p>340</p>	<p>51</p>	<p>677</p>	<p>9</p>	<p>138</p>
	<p>5-10 ha</p>	<p>135</p>	<p>20</p>	<p>979</p>	<p>12</p>	
	<p>10-30 ha</p>	<p>113</p>	<p>17</p>	<p>1,972</p>	<p>25</p>	
	<p>&gt;30 ha</p>	<p>72</p>	<p>11</p>	<p>4,258</p>	<p>54</p>	
	<p>Total</p>	<p>660</p>		<p>7,886</p>		



# MIDDLE EAST SYDENHAM HIGHLIGHTS

## Highlights and Progress Since 2011

- There were 38 stewardship projects completed in the Middle East Sydenham subwatershed from 2011 to 2018. These projects included the restoration of wetlands, stabilization of streambanks, installation of erosion control measures, enhancement of upland habitat, and the planting of trees and riparian buffers. More than 46,600 trees were planted and the total value of all the projects was \$431,900 (60% grants).
- The Municipality of Brooke-Alvinston developed a tree subsidy program in 2013 to encourage its residents to plant more trees – over 2,500 trees have been purchased through the program.
- In 2016, Ontario Nature purchased a 193-acre property, which includes a 2-km stretch of the Sydenham River, to establish the Sydenham River Nature Reserve. This property has an extraordinary diversity of plants and animals, including 34 species of mussel, 11 of which are listed as Species at Risk. Half of Ontario's bird species breed in or pass through the area during migration.



- The SCRCA organized an educational aquatic BioBlitz at the A.W. Campbell Conservation Area in 2017, participants studied and learned about local fish, mussels, and other stream life (left photo).
- The St. Clair Region Conservation Foundation's annual Sydenham Canoe and Kayak Race has raised \$20,000 in donations for conservation education programs since 2011.
- The SCRCA, through an agreement with MNRF, installed new meteorological equipment at A.W. Campbell Conservation Area in 2017 that will improve the monitoring of precipitation and flow conditions.
- Tim and Tina Lehrbass have adopted best management practices on their farm including rotational grazing and interseeding corn for overwinter grazing. In 2017, the Lehrbasses hosted a pasture tour where alternative cattle grazing systems were discussed with about 100 local farmers (right photo).



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