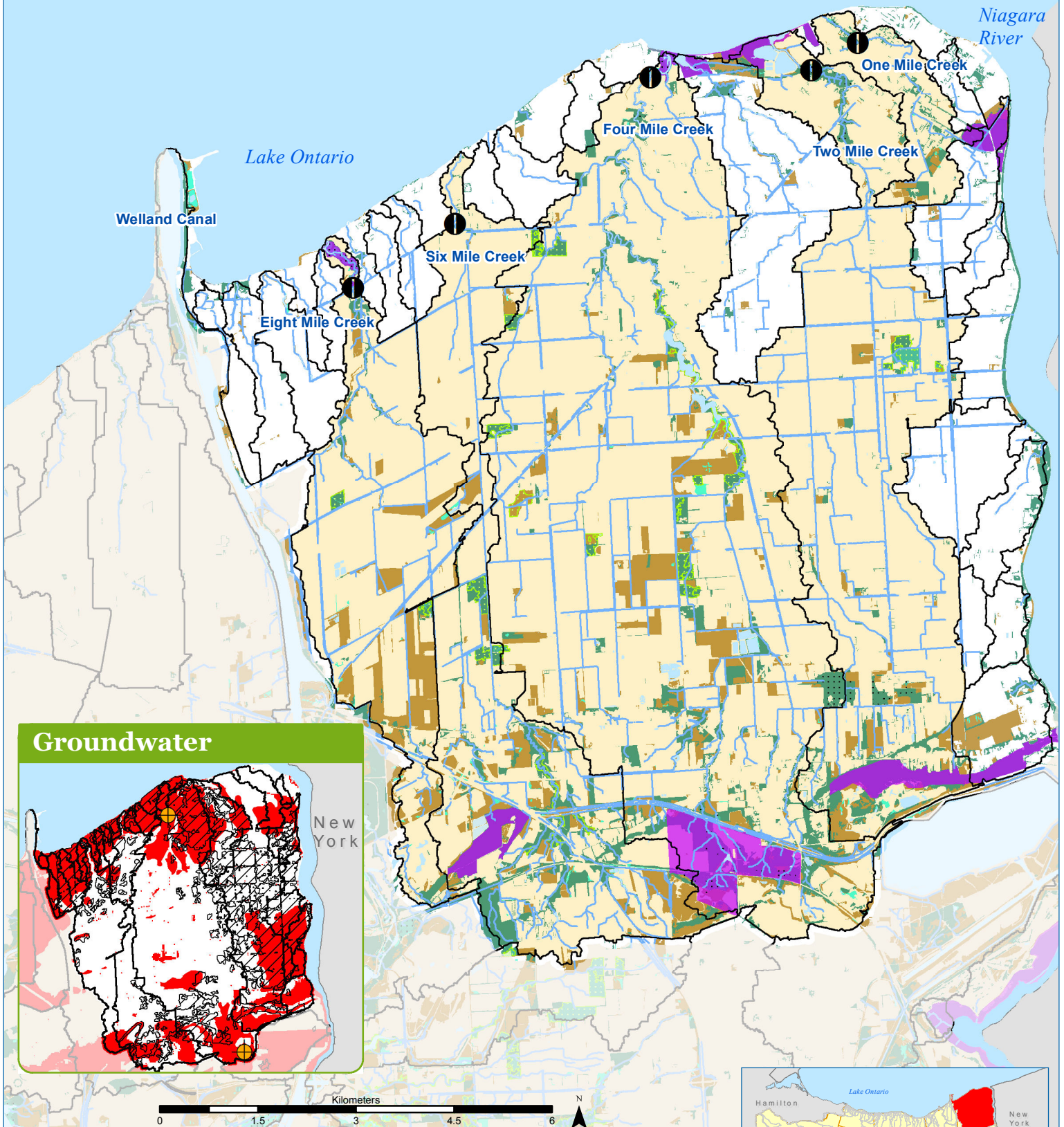
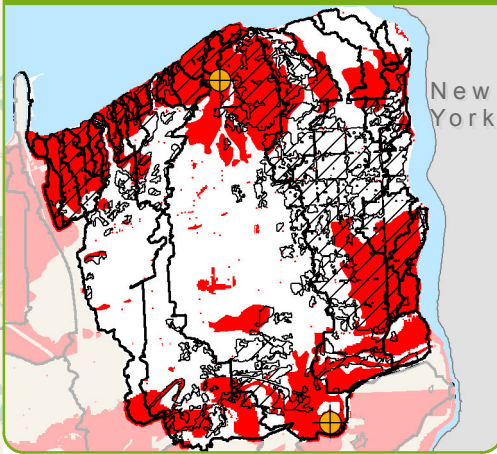


Niagara-on-the-Lake

2012 Watershed Report Card



Groundwater



- | | | |
|-----------------------|---|---|
| General Natural Areas | Successional | ● Surface Water Quality Monitoring Station |
| Rock Barren | Wetland | ● Provincial Groundwater Monitoring Network |
| Bluff | Swamp | — Watercourses |
| Shoreline | Wooded Area | — Significant Groundwater Recharge Area |
| Open Water | Provincially Significant Wetland | — Highly Vulnerable Aquifer |
| | Locally Significant Wetland | — Subwatershed Boundary |
| | Area of Natural and Scientific Interest | — Sampled Subwatershed |





Watershed Characteristics

Area	137 km ²																														
Land Use	Agriculture is prominent and is largely grape and greenhouse operations. There are urban and residential areas within the city of Niagara-on-the-Lake. Some other minor land uses include aggregate operations, commercial development, and food processing.																														
Soil Type	<1% Upland Escarpment, 16% Developed Areas, 30% Mixed Clay and Loam, 14% Mixed Sand and Loam, 39% Mixed Silt and Loam, 0.2% Water																														
Physiography	The Haldimand Clay Plain extends to the Niagara River. There is a pocket of sand plain along the Niagara River as well as along Lake Ontario on the northern portion of the study area. Till Moraine runs part of the southern portion. The Niagara Escarpment runs east-west through to the Niagara River.																														
Dams & Barriers	In-stream barriers exist that prevent salmon from further migrating.																														
Sewage Services	Urban sewage is directed to treatment ponds. Rural landowners may be serviced by private septic systems.																														
% Natural Area Types	Total Natural Area= 22.7 km ² 53% Wooded, 3% Wetland, 1% Swamp, 42% Successional, <0.4% Unique																														
Woodlot or Patch Size	<table><tr><th>Size Category</th><th>Number of Woodlots</th><th>Total Woodland Area in WPA (ha)</th><th>% Woodland</th><th>Largest Woodlot (ha)</th></tr><tr><td>20 to 50 ha</td><td>5</td><td>168.10</td><td>1.23</td><td>42.85</td></tr><tr><td>50 to 75 ha</td><td></td><td></td><td></td><td></td></tr><tr><td>75 to 100 ha</td><td></td><td></td><td></td><td></td></tr><tr><td>100 to 200 ha</td><td>1</td><td>121.28</td><td>0.89</td><td>122.69</td></tr><tr><td>>200 ha</td><td></td><td></td><td></td><td></td></tr></table>	Size Category	Number of Woodlots	Total Woodland Area in WPA (ha)	% Woodland	Largest Woodlot (ha)	20 to 50 ha	5	168.10	1.23	42.85	50 to 75 ha					75 to 100 ha					100 to 200 ha	1	121.28	0.89	122.69	>200 ha				
	Size Category	Number of Woodlots	Total Woodland Area in WPA (ha)	% Woodland	Largest Woodlot (ha)																										
	20 to 50 ha	5	168.10	1.23	42.85																										
	50 to 75 ha																														
	75 to 100 ha																														
	100 to 200 ha	1	121.28	0.89	122.69																										
>200 ha																															
Fisheries Resources	19 fish species have been identified in Niagara-on-the-Lake such as Chinook Salmon, trout, and various bass and minnows.																														
Species at Risk	There are two bird species at risk; Tufted Titmouse and Red-headed Woodpecker.																														

Groundwater



Groundwater Vulnerability

The Niagara Water Strategy, NPCA Groundwater Study, and the Niagara Peninsula Source Protection Area Assessment Report have identified the Niagara-on-the-Lake (NOTL) watershed as moderately vulnerable to groundwater contamination. Vulnerable areas were identified with at-surface sand and gravel aquifers and areas with some thin overburden and bedrock outcrops. At-surface aquifers allow direct access of contaminants to the water table with little time for clean-up. Thin overburden and bedrock outcrops are unable to effectively filter bacteria, sediment and other insoluble forms of contaminants that in thicker overburden would become trapped and filtered within the soil pores. In addition, openings in the fractured bedrock allow for the direct passage of surface water and contaminants to groundwater resources.

Private Wells

The NOTL watershed is primarily serviced by municipal water supplies with less than 50% of the population on private water supplies such as groundwater wells. Water wells need to be properly constructed and maintained to prevent contamination. The safety, testing and treatment of a private well is the responsibility of the well owner.

Groundwater Stress

The Niagara Peninsula Source Protection Tier 1 Water Budget identified the NOTL watershed as at a low stress level with respect to groundwater supply relative to their overall demands.

Groundwater Monitoring

The NPCA has been monitoring one Provincial Groundwater Monitoring Network (PGMN) well in the Niagara-on-the-Lake watershed since 2003. One PGMN well (W384) is located on Wagg Road in NOTL and it monitors chemistry and water levels of the Iroquois Sandplain. Water quality results for PGMN well W384 exceeded Ontario Drinking Water Quality Standards for nitrate. The nitrate exceedance was thoroughly investigated by Ministry of Environment, NPCA, Municipal and Public Health staff and found to be caused by contamination from the adjacent landuse. NPCA and Public Health staff sampled nearby private wells and determined that contamination was isolated to the PGMN well. Data for this PGMN well show that groundwater levels generally decline from May to October, and increase from fall to spring with the largest increase in March. Groundwater levels were lowest in 2007 during a significant drought year.

Stewardship Highlights



The Niagara-on-the-Lake (NOTL) Watersheds have benefited from the many activities and the active involvement of individuals, organizations and municipalities on private and public lands. Some examples of the progress which has occurred in the watershed follows:

- Watershed landowners have completed 42 water and habitat improvement projects with the assistance of the NPCA's Water Quality Improvement Program and other organizations such as the *Ontario Soil and Crop Improvement Association*, *Friends of One Mile Creek* and *Henry Schein-Canada*. These projects include Best Management Farm Practices, as well as forest, stream and wetland habitat and water quality improvements, using over 5000 native trees and shrubs as well as over 10000 wildflowers and grasses.
- Between 2007-2010 three elementary schools within the NOTL Watersheds (Parliament Oak, St. Michael, and Niagara District Secondary School) participated in the NPCA's ECO School schoolyard naturalization program. This program has now been replaced by the NPCA's Canopies for Kids program which provides 25 shade trees to elementary school with little or no natural cover.
- The NPCA undertook an Ecological Land Classification exercise at Woodend Conservation Area to map out the different vegetative communities that exist there in order to better inform management options.



- The NOTL Watershed Study Final Report was completed in 2008 to put forth recommendations on how to progress towards a healthier and more sustainable watershed with a focus on improved water quality. A Watershed Plan Implementation Committee was formed in 2009 to help facilitate and monitor these recommendations with members from the *NPCA, Town of NOTL, Niagara Region, Trout Unlimited Canada, and Friends of Four Mile Creek*.
- In 1987 the Niagara River was designated as one of 43 Areas of Concern (AOCs) around the Great Lakes Basin by the governments of Canada and the United States due to degraded water quality from historical pollution. On the Canadian side, The Niagara River Remedial Action Plan (RAP) was set up in collaboration with the local community to identify water quality concerns (from the official list of 14 Beneficial Use Impairments, or BUIs) and take actions to resolve them. When the concerns have been addressed, the scientific evidence will be presented to “delist” the AOC. So far, the analyses of the most current data against performance measures (delisting criteria) have allowed the following BUI’s to be re-designated to “Not Impaired”, as documented in the Stage 2 Update report: Restrictions on Wildlife Consumption, Fish Tumours and Other Deformities, and Bird or Animal Deformities or Reproduction Problems. Under implementation of the new Great Lakes Water Quality Protocol of 2012, it is anticipated that actions to delist the AOC will be completed within the next few years.
- Through Trout Unlimited Canada’s Yellow Fish Road program, The *NPCA* coordinated 4 events within the NOTL Watersheds. 35 people from local community groups helped paint yellow fish on 62 stormwater drains to inform the public that the water (clean and dirty) that goes down these drains ends up in our local water bodies.
- The Bruce Trail Conservancy has been active in the NOTL watersheds as the trail runs through the watershed. Several garbage clean ups have taken place on properties managed by BTC.
- The Niagara Parks Commission (NPC) and Ontario Power Generation (OPG) have been involved in several stewardship initiatives in the NOTL watersheds. The NPC has created a 1.6 hectare prairie area in Queenston, Biodiversity Plots and prescribed burns in Paradise Grove, and invasive species removal along the parkway.
- Since 2007 other community groups and organizations such as The Friends of One Mile Creek have also been working to improve the local water and habitat quality as well as raise awareness of local environmental issues. These groups have coordinated public education events and taken part in environmental restoration efforts throughout the NOTL Watersheds.



There has been much work completed on research and improving the health of NOTL Watersheds since 2007. **Appendix A** provides a list of some of the documents that have been published which have aided in a better understanding of the local issues as well as put forth recommendations and actions for further enhancements and improvements to the watersheds.

Eight Mile Creek

2012 Watershed Report Card

GRADES

Surface Water Quality	D
Forest Conditions	F

Watershed Characteristics

Municipalities	Niagara-on-the-Lake (98%) Niagara Falls (2%)
Significant Natural Areas	Provincially Significant Wetland: Eight Mile Estuary Wetland Complex Locally Significant Wetlands: Upper Eight Mile Creek Wetland and Lincoln Airport Wetland Complex Area of Natural and Scientific Interest: McNab Marsh

Lake Ontario

McNab Marsh Life ANSI
Eight Mile Creek Estuary Wetland

Welland Canal

Upper Eight Mile Creek Wetland

Church Road

McNab Road

Stewart Road

Niagara Stone Road

Lincoln Airport Wetland Complex

Airport Road

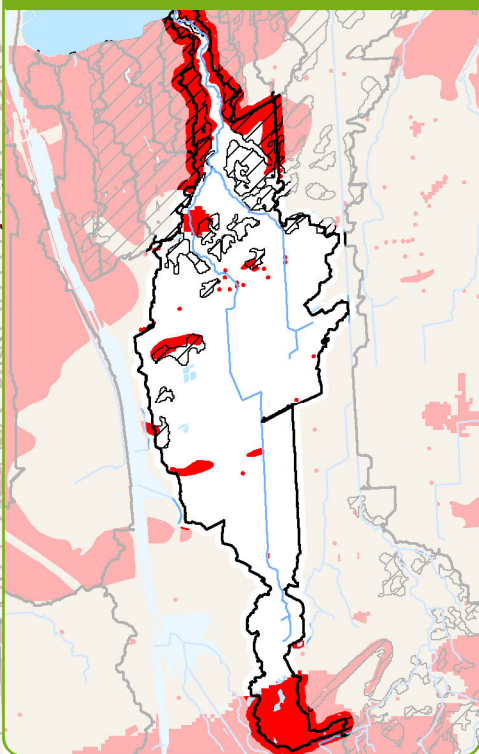
Queen Elizabeth Way

Glendale Avenue

Niagara-on-the-Lake

Niagara Falls

Groundwater



Kilometers
0 0.75 1.5 2.25 3

General Natural Areas	Successional	Surface Water Quality Monitoring Station
Rock Barren	Wetland	Watercourses
Bluff	Swamp	Roads
Shoreline	Wooded Area	Significant Groundwater Recharge Area
Open Water	Provincially Significant Wetland	Highly Vulnerable Aquifer
	Locally Significant Wetland	Subwatershed Boundary
	Area of Natural and Scientific Interest	Municipal Boundary



Surface Water Quality

GRADE
D

Surface water quality monitoring of Eight Mile Creek on Lakeshore Road was initiated in 2009 and was given an overall grade of D. The water quality of this watershed regularly exceeded provincial guidelines for phosphorus and *E. coli*. The concentrations of these parameters have remained unchanged since 2009. The benthic community found in this watershed mainly consisted of pollutant tolerant animals and indicated impaired water quality. Watershed initiatives that reduce nutrient and bacteria contamination will improve the water quality of Eight Mile Creek.

Indicators		2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	120	30	Phosphorus is found in products such as soap, detergent, and fertilizer as well as waste, and contributes to excess algae and low oxygen in streams and rivers
	Grade	D	B	
Bacteria	(<i>E. coli</i> /100ml)**	251	100	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste and, in water, indicates fecal contamination. <i>E. coli</i> is a strong indicator for the potential to have other disease-causing organisms in the water.
	Grade	C	B	
Benthic	(FBI)	6.56	<5.00 (Target Only)	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.
	Grade	F	B	

*75th percentile, NPCA data. **Geometric mean, NPCA data. Province-wide Grading System used.

Forest Conditions

GRADE
F

The forest condition indicators for Eight Mile Creek watershed produced an overall grade of F. The Forest Cover % and Forest Interior % also received grades of F, well below the provincial target. These grades are a result of their being very little forest cover in the watershed and the lack of connectivity between the forest patches that do remain. The Riparian Zone Forested % also received a grade of F as the vegetation that does remain adjacent to the watercourses is successional in nature.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	4	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	F	B	
Forest Interior	%	0	10.0	Percent forest interior is the percentage of the watershed that is forested interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered 'edge' habitat and is prone to high predation, wind damage and alien species invasion.
	Grade	F	B	
Riparian Zone Forested	%	9.5	50.0	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions.
	Grade	F	B	

** Targets for southern Ontario based on Environment Canada (2004) and Conservation Ontario (2011)

Six Mile Creek

2012 Watershed Report Card

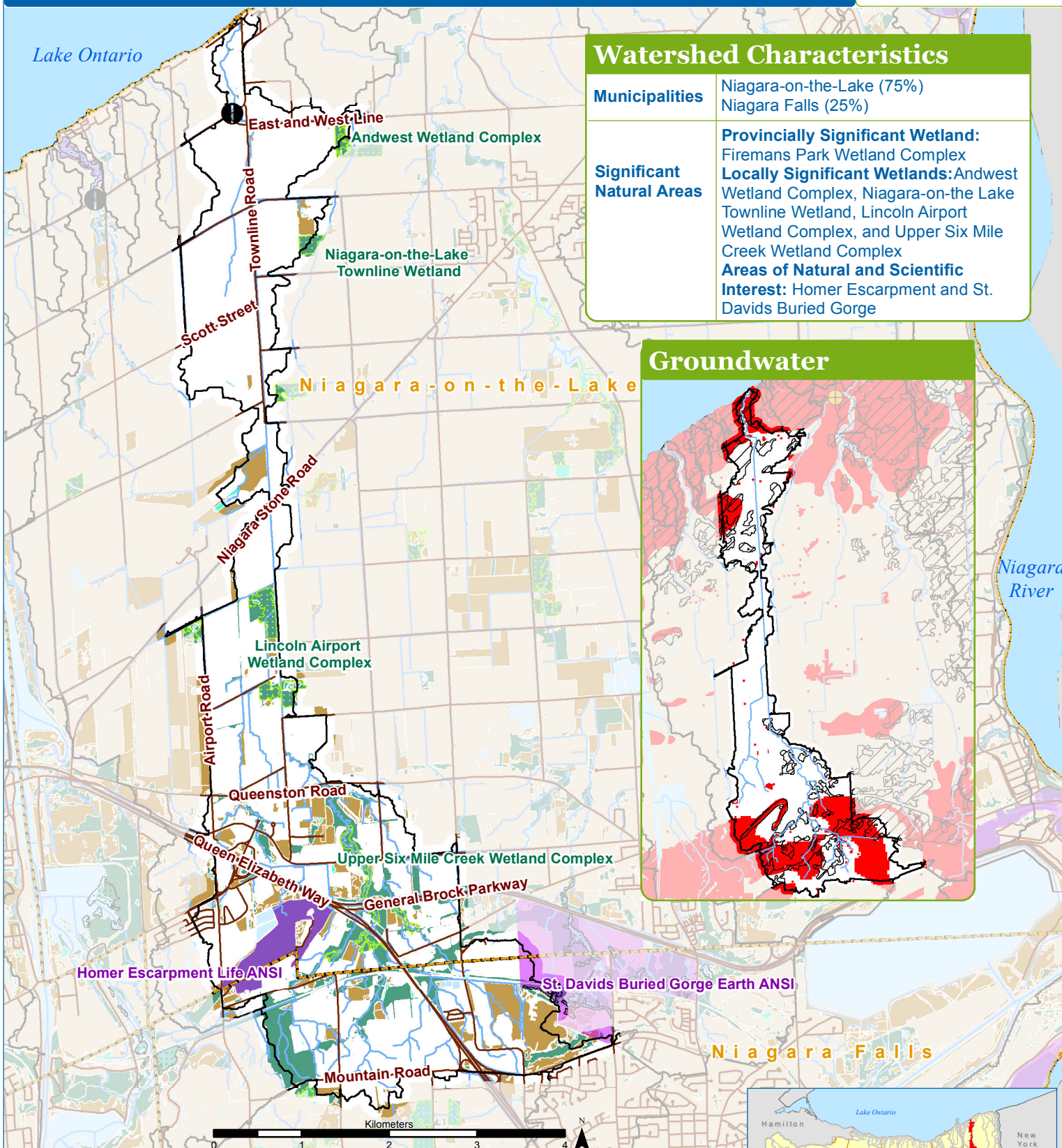
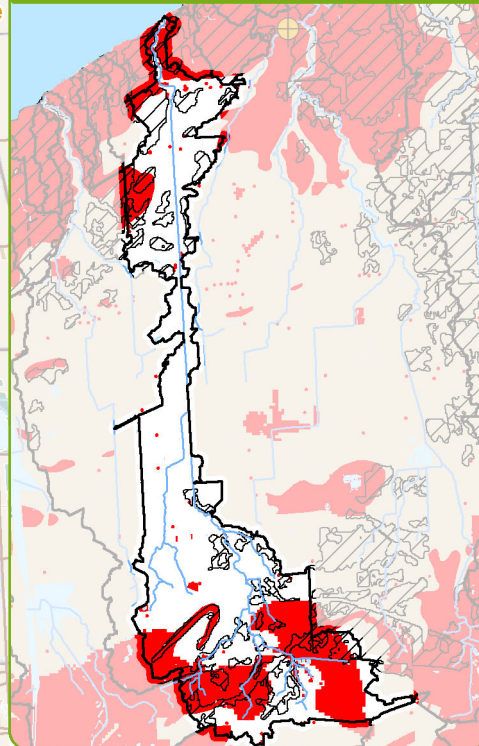
GRADES

Surface Water Quality	D
Forest Conditions	D

Watershed Characteristics

Municipalities	Niagara-on-the-Lake (75%) Niagara Falls (25%)
Significant Natural Areas	Provincially Significant Wetland: Firemans Park Wetland Complex Locally Significant Wetlands: Andwest Wetland Complex, Niagara-on-the-Lake Townline Wetland, Lincoln Airport Wetland Complex, and Upper Six Mile Creek Wetland Complex Areas of Natural and Scientific Interest: Homer Escarpment and St. Davids Buried Gorge

Groundwater



- | | | |
|------------------------------|---|--|
| General Natural Areas | Successional | Surface Water Quality Monitoring Station |
| Rock Barren | Wetland | Watercourses |
| Bluff | Swamp | Roads |
| Shoreline | Wooded Area | Significant Groundwater Recharge Area |
| Open Water | Provincially Significant Wetland | Highly Vulnerable Aquifer |
| | Locally Significant Wetland | Subwatershed Boundary |
| | Area of Natural and Scientific Interest | Municipal Boundary |



Surface Water Quality

GRADE
D

Surface water quality monitoring of Six Mile Creek on Lakeshore Road was initiated in 2009 and was given an overall grade of D. The water quality of this watershed regularly exceeded provincial guidelines for phosphorus and *E. coli*. The concentrations of these parameters have remained unchanged since 2009. The benthic community found in this watershed mainly consisted of pollutant tolerant animals and indicated impaired water quality. Watershed initiatives that reduce nutrient and bacteria contamination will improve the water quality of Six Mile Creek.

Indicators		2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	105	30	Phosphorus is found in products such as soap, detergent, and fertilizer as well as waste, and contributes to excess algae and low oxygen in streams and rivers
	Grade	D	B	
Bacteria	(<i>E. coli</i> /100ml)**	277	100	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste and, in water, indicates fecal contamination. <i>E. coli</i> is a strong indicator for the potential to have other disease-causing organisms in the water.
	Grade	C	B	
Benthic	(FBI)	6.02	<5.00 (Target Only)	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.
	Grade	D	B	

*75th percentile, NPCA data. **Geometric mean, NPCA data. Province-wide Grading System used.

Forest Conditions

GRADE
D

The forest condition indicators for Six Mile Creek watershed produced an overall grade of D. The Forest Cover % received a grade of D due in part to a small number of forested patches in the upper reaches of the watershed along Townline Grantham Road. The Forest Interior % received a grade of F, well below the provincial target. This is the result of a lack of connectivity between the forest patches that do remain. The Riparian Zone Forested % received a grade of D as the vegetation that does remain adjacent to the watercourses is successional in nature.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	14	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	D	B	
Forest Interior	%	0.8	10.0	Percent forest interior is the percentage of the watershed that is forested interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered 'edge' habitat and is prone to high predation, wind damage and alien species invasion.
	Grade	F	B	
Riparian Zone Forested	%	22.9	50.0	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions.
	Grade	D	B	

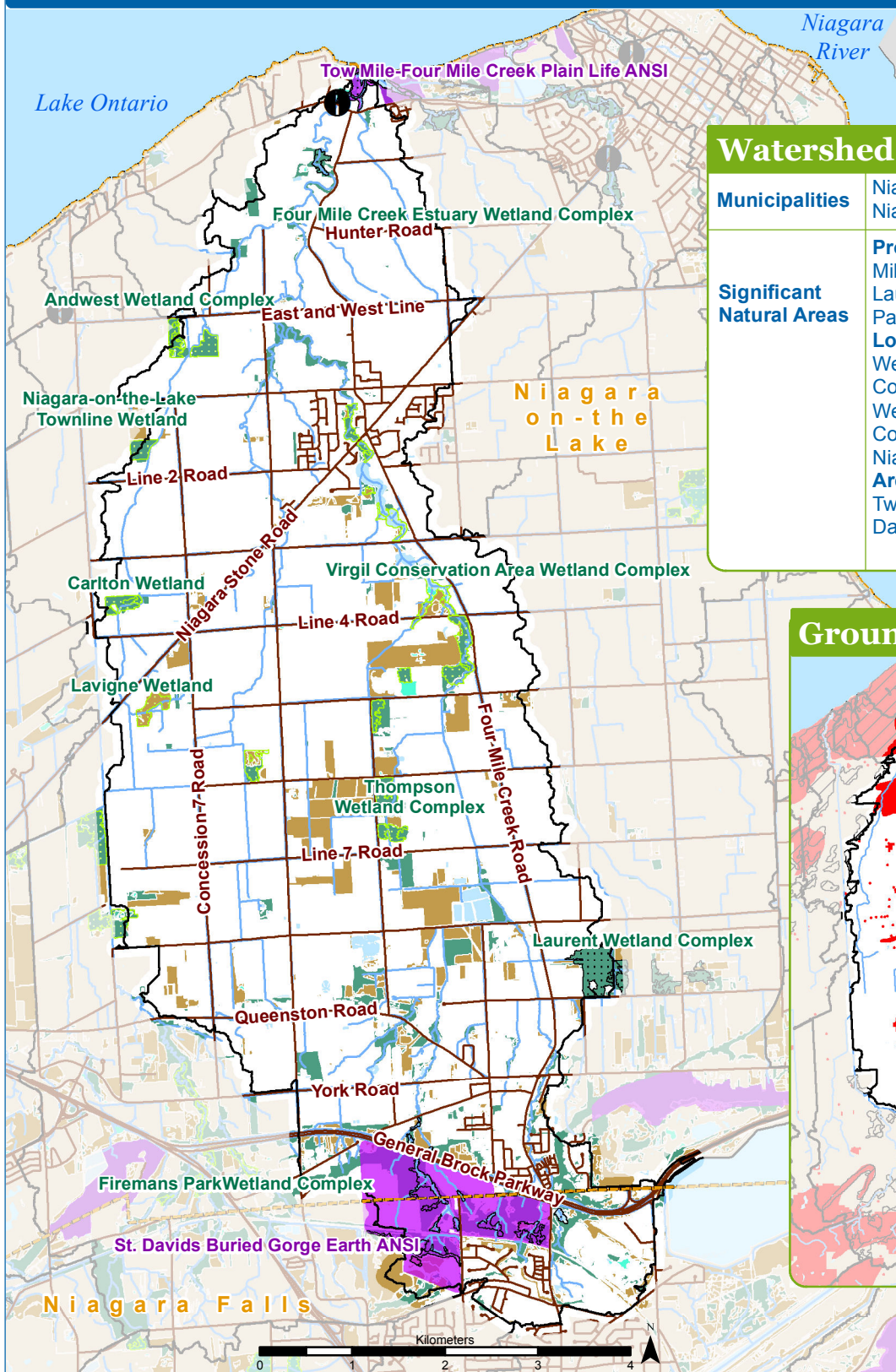
** Targets for southern Ontario based on Environment Canada (2004) and Conservation Ontario (2011)

Four Mile Creek

2012 Watershed Report Card

GRADES

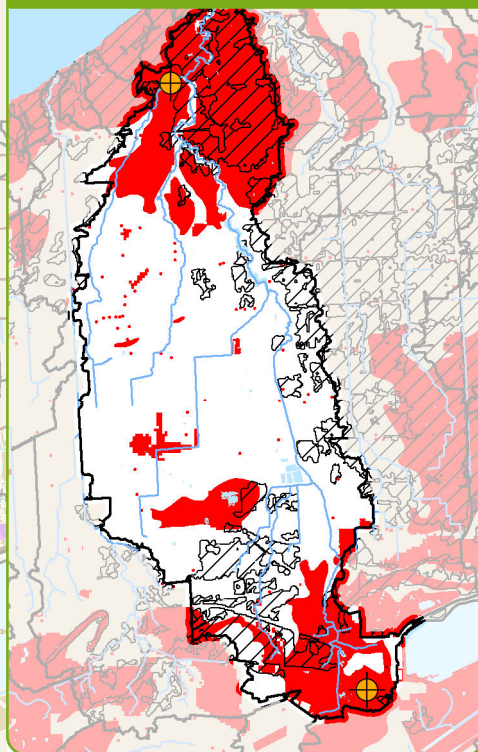
Surface Water Quality	F
Forest Conditions	D



Watershed Characteristics

Municipalities	Niagara-on-the-Lake (93%) Niagara Falls (7%)
Significant Natural Areas	Provincially Significant Wetlands: Four Mile Creek Estuary Wetland Complex, Laurent Wetland Complex, and Firemans Park Wetland Complex Locally Significant Wetlands: Andwest Wetland Complex, Thompson Wetland Complex, Bergman Wetland, Lavigne Wetland, Carlton Wetland, Virgil Conservation Area Wetland Complex, and Niagara-on-the-Lake Townline Wetland Areas of Natural and Scientific Interest: Two Mile-Four Mile Creek Plain and St. Davids Buried Gorge

Groundwater



- | | | |
|---|---|--|
| <p>General Natural Areas</p> <ul style="list-style-type: none"> Rock Barren Bluff Shoreline Open Water | <p> Successional Wetland
 Swamp
 Wooded Area
 Provincially Significant Wetland
 Locally Significant Wetland
 Area of Natural and Scientific Interest </p> | <p> Surface Water Quality Monitoring Station
 Provincial Groundwater Monitoring Network
 Watercourses
 Roads
 Significant Groundwater Recharge Area
 Highly Vulnerable Aquifer
 Subwatershed Boundary
 Municipal Boundary </p> |
|---|---|--|



Surface Water Quality

GRADE
F

Surface water quality monitoring of Four Mile Creek on Lakeshore Road was initiated in 2003 and was given an overall grade of F. The water quality of this watershed regularly exceeded provincial guidelines for phosphorus and *E. coli*. The concentrations of these parameters have remained unchanged since 2003. The benthic community found in this watershed mainly consisted of pollutant tolerant animals and indicated impaired water quality. Watershed initiatives that reduce nutrient and bacteria contamination will improve the water quality of Four Mile Creek.

Indicators		2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	265	30	Phosphorus is found in products such as soap, detergent, and fertilizer as well as waste, and contributes to excess algae and low oxygen in streams and rivers
	Grade	F	B	
Bacteria	(<i>E. coli</i> /100ml)**	439	100	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste and, in water, indicates fecal contamination. <i>E. coli</i> is a strong indicator for the potential to have other disease-causing organisms in the water.
	Grade	D	B	
Benthic	(FBI)	7.04	<5.00 (Target Only)	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.
	Grade	F	B	

*75th percentile, NPCA data. **Geometric mean, NPCA data. Province-wide Grading System used.

Forest Conditions

GRADE
D

The forest condition indicators for Four Mile Creek watershed produced an overall grade of D. The Forest Cover % received a grade of D as a result of the small number of mid-sized forests in the upper reaches of the watershed along Concession 5 Road and the large complex at the mouth of the creek. The Forest Interior % received a grade of F, well below the provincial target. This is the result of a lack of connectivity between the forest patches that remain in other parts of this watershed. The Riparian Zone Forested % received a grade of D that can be attributed to a stretch of forest along the creek on Four Mile Creek Road.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	9	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	D	B	
Forest Interior	%	0.2	10.0	Percent forest interior is the percentage of the watershed that is forested interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered 'edge' habitat and is prone to high predation, wind damage and alien species invasion.
	Grade	F	B	
Riparian Zone Forested	%	15.6	50.0	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions.
	Grade	D	B	

** Targets for southern Ontario based on Environment Canada (2004) and Conservation Ontario (2011)

Two Mile Creek

2012 Watershed Report Card

GRADES

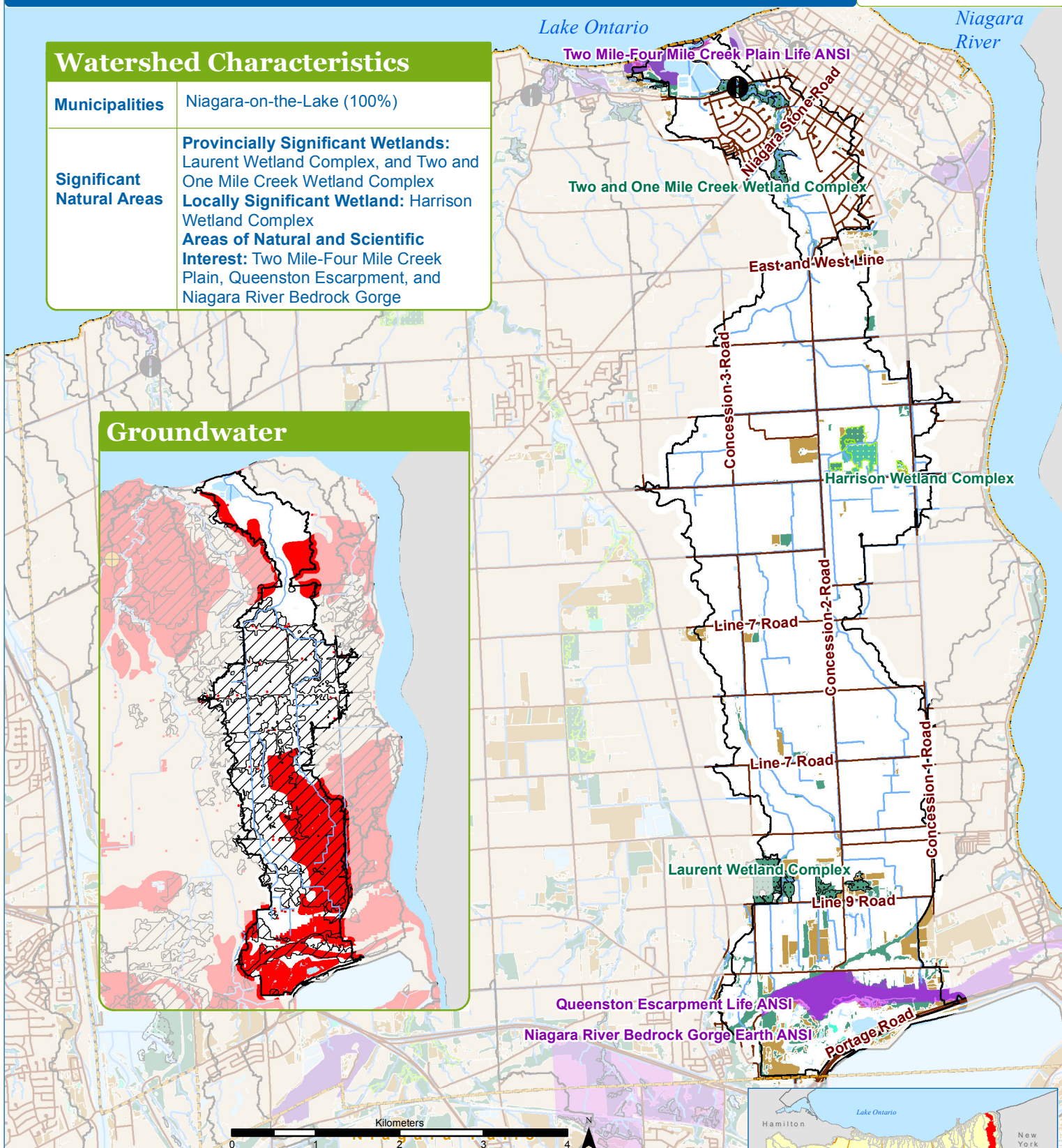
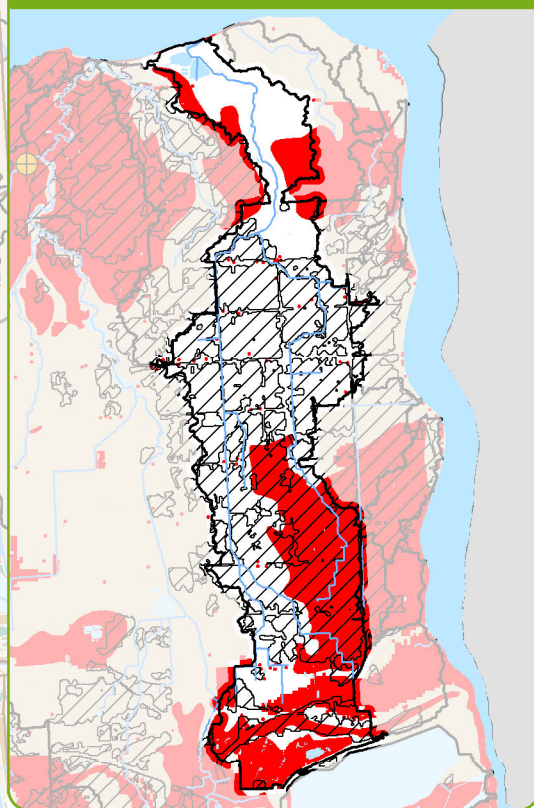
Surface Water Quality **F**

Forest Conditions **F**

Watershed Characteristics

Municipalities	Niagara-on-the-Lake (100%)
Significant Natural Areas	Provincially Significant Wetlands: Laurent Wetland Complex, and Two and One Mile Creek Wetland Complex Locally Significant Wetland: Harrison Wetland Complex Areas of Natural and Scientific Interest: Two Mile-Four Mile Creek Plain, Queenston Escarpment, and Niagara River Bedrock Gorge

Groundwater



- | | | |
|---|---|--|
| General Natural Areas
Rock Barren
Bluff
Shoreline
Open Water | Successional
Wetland
Swamp
Wooded Area
Provincially Significant Wetland
Locally Significant Wetland
Area of Natural and Scientific Interest | Surface Water Quality Monitoring Station
Watercourses
Roads
Significant Groundwater Recharge Area
Highly Vulnerable Aquifer
Subwatershed Boundary |
|---|---|--|



Surface Water Quality

GRADE
F

Surface water quality monitoring of Two Mile Creek on Lakeshore Road was initiated in 2003 and was given an overall grade of F. The water quality of this watershed regularly exceeded provincial guidelines for phosphorus and *E. coli*. The concentrations of these parameters have remained unchanged since 2003. The benthic community found in this watershed mainly consisted of pollutant tolerant animals and indicated impaired water quality. Watershed initiatives that reduce nutrient and bacteria contamination will improve the water quality of Two Mile Creek.

Indicators		2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	103	30	Phosphorus is found in products such as soap, detergent, and fertilizer as well as waste, and contributes to excess algae and low oxygen in streams and rivers
	Grade	D	B	
Bacteria	(<i>E. coli</i> /100ml)**	2425	100	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste and, in water, indicates fecal contamination. <i>E. coli</i> is a strong indicator for the potential to have other disease-causing organisms in the water.
	Grade	F	B	
Benthic	(FBI)	6.81	<5.00 (Target Only)	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.
	Grade	F	B	

*75th percentile, NPCA data. **Geometric mean, NPCA data. Province-wide Grading System used.

Forest Conditions

GRADE
F

The forest condition indicators for Two Mile Creek watershed produced an overall grade of F. The Forest Cover % received a grade of D due in large part to a contiguous forested area in the headwaters of the watershed south of York Road. The Forest Interior % received a grade of F, well below the provincial target. This is the result of a lack of connectivity between the forest patches that do remain in the rest of the watershed. The Riparian Zone Forested % received a grade of F as the vegetation that does remain adjacent to the watercourses is successional in nature.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	9	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	D	B	
Forest Interior	%	0.4	10.0	Percent forest interior is the percentage of the watershed that is forested interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered 'edge' habitat and is prone to high predation, wind damage and alien species invasion.
	Grade	F	B	
Riparian Zone Forested	%	11.6	50.0	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions.
	Grade	F	B	

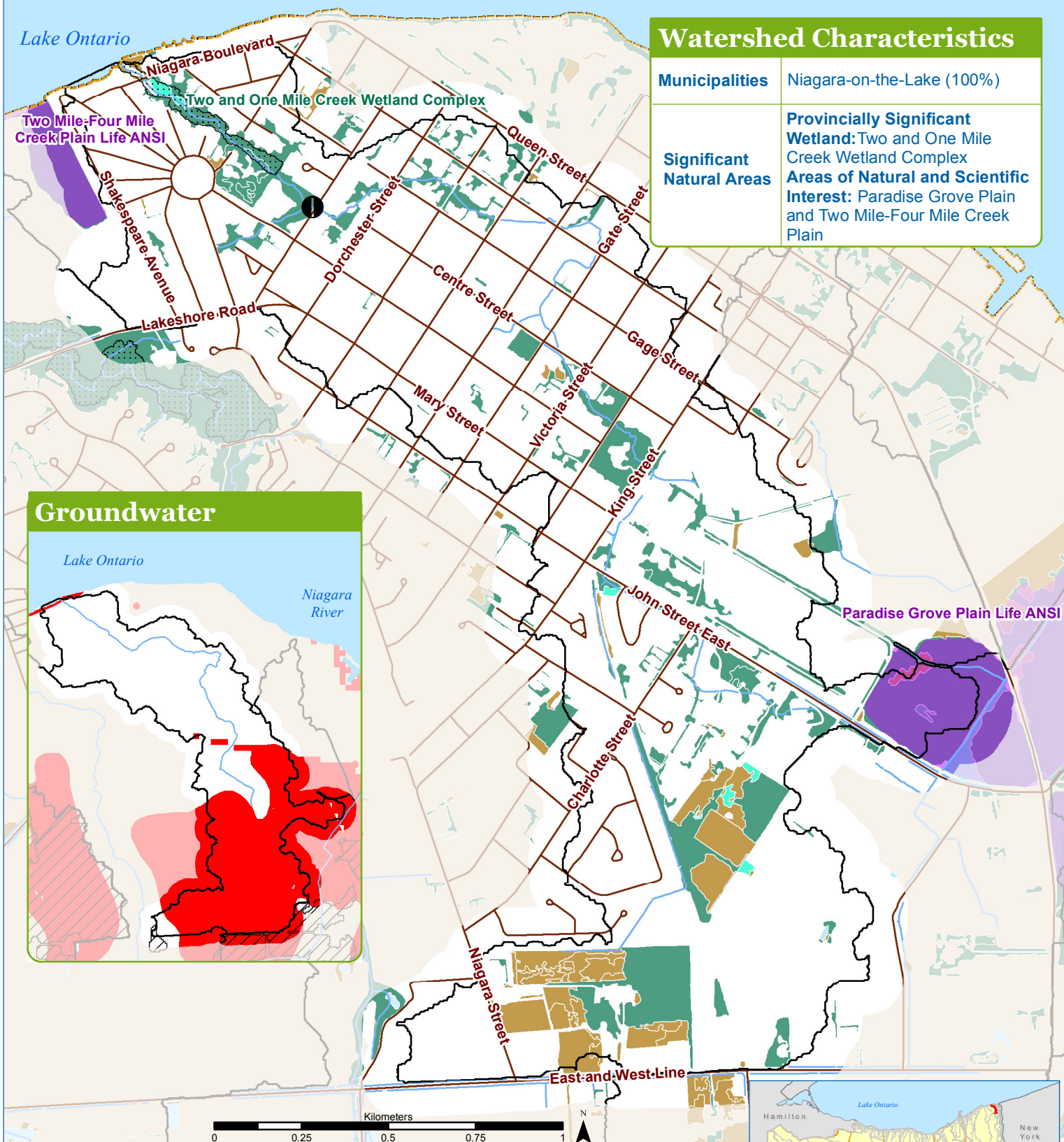
** Targets for southern Ontario based on Environment Canada (2004) and Conservation Ontario (2011)

One Mile Creek

2012 Watershed Report Card

GRADES

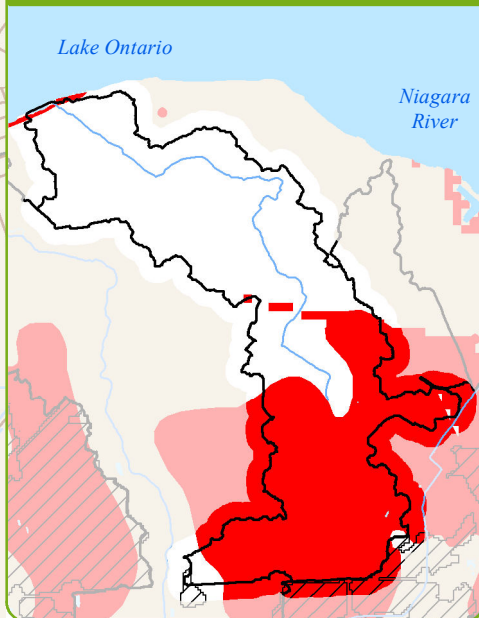
Surface Water Quality	D
Forest Conditions	D



Watershed Characteristics

Municipalities	Niagara-on-the-Lake (100%)
Significant Natural Areas	Provincially Significant Wetland: Two and One Mile Creek Wetland Complex Areas of Natural and Scientific Interest: Paradise Grove Plain and Two Mile-Four Mile Creek Plain

Groundwater



- | | | |
|---|--|--|
| General Natural Areas
Rock Barren
Bluff
Shoreline
Open Water | Successional
Wetland
Swamp
Wooded Area
Provincially Significant Wetland
Area of Natural and Scientific Interest | Surface Water Quality Monitoring Station
Watercourses
Roads
Significant Groundwater Recharge Area
Highly Vulnerable Aquifer
Subwatershed Boundary |
|---|--|--|



Surface Water Quality

GRADE
D

Surface water quality monitoring of One Mile Creek on Nassau Road was initiated in 2009 and was given an overall grade of D. The water quality of this watershed regularly exceeded provincial guidelines for phosphorus and *E. coli*. There were also frequent exceedances of copper and nickel observed. The benthic community found in this watershed consisted of a mix of pollutant tolerant and pollutant sensitive animals and nearly achieved the Benthic Indicator target. Watershed initiatives that reduce nutrient and bacteria contamination will improve the water quality of One Mile Creek.

Indicators		2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	115	30	Phosphorus is found in products such as soap, detergent, and fertilizer as well as waste, and contributes to excess algae and low oxygen in streams and rivers
	Grade	D	B	
Bacteria	(<i>E. coli</i> /100ml)**	382	100	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste and, in water, indicates fecal contamination. <i>E. coli</i> is a strong indicator for the potential to have other disease-causing organisms in the water.
	Grade	D	B	
Benthic	(FBI)	5.90	<5.00 (Target Only)	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.
	Grade	D	B	

*75th percentile, NPCA data. **Geometric mean, NPCA data. Province-wide Grading System used.

Forest Conditions

GRADE
D

The forest condition indicators for One Mile Creek watershed produced an overall grade of D. The Forest Cover % received a grade of D as a result of the large forests associated with the Fort George property. The Forest Interior % received a grade of F, well below the provincial target. This is the result of a lack of connectivity between the forest patches that remain in other parts of this watershed. The Riparian Zone Forested % received a grade of D due to a concentrated restoration effort in the watershed by private landowners.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	12	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	D	B	
Forest Interior	%	0	10.0	Percent forest interior is the percentage of the watershed that is forested interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered 'edge' habitat and is prone to high predation, wind damage and alien species invasion.
	Grade	F	B	
Riparian Zone Forested	%	26.5	50.0	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions.
	Grade	D	B	

** Targets for southern Ontario based on Environment Canada (2004) and Conservation Ontario (2011)