

Lake Erie North Shore

2012 Watershed Report Card



Watershed Characteristics



Plants – 6 including Butternut and Eastern Flowering Dogwood. Reptiles – 8 including Fowler's Toad and

Groundwater



Groundwater Vulnerability

Blanding's Turtle.

The Niagara Water Strategy, NPCA Groundwater Study, and the Niagara Peninsula Source Protection Area Assessment Report have identified the Lake Erie North Shore study area as highly vulnerable to groundwater contamination due to the thin overburden and bedrock outcrops. The thin overburden is unable to effectively provide the groundwater with sufficient protection from bacteria, sediment and other insoluble forms of contaminants that in thicker overburden would become trapped and filtered within the soil pores. In addition, the openings in the fractured bedrock as well as the porous limestone allow for the direct passage of surface water and contaminants to groundwater resources. **Private Wells**

Lake Erie North Shore area is primarily serviced by municipal supplies, but about 22% of the population is 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 Lake Erie North Shore as significantly stressed with respect to groundwater supply relative to its overall demand.

Stewardship Highlights

The Lake Erie North Shore 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 9 water and habitat improvement projects with the assistance of the NPCA's Water Quality Improvement Program and other organizations such as Ducks Unlimited Canada and Land Care Niagara. These projects included Farm Best Management Practices as well as Forest and Wetland Habitat Enhancements. Using over 30,000 native trees, shrubs and wildflowers, landowners have enriched over 20 hectares of natural lands.
- The NPCA undertook maintenance of the 0.08 hectare Prairie/Savannah restoration site at Morgan's Point Conservation Area which involves periodic weed suppression by cutting and/or burning.
- Through Trout Unlimited Canada's Yellow Fish Road program, The NPCA coordinated 5 events in Lake Erie North Shore Watersheds. 89 people from local community groups helped paint yellow fish on 139 stormwater drains and distributed 381 door hangers to inform the public that the water (clean and dirty) that goes down these drains ends up in our local water bodies.
- Elementary and high schools within the Lake Erie North Shore Watersheds have also been participating in several environmental education programs through the Niagara Peninsula Conservation Authority, including EcoSchool Ecogarden plots, Canopies for Kids and, the Annual Regional Envirothon Competition which saw Lakeshore Catholic High School place 1st or 2nd since it began in 2008.
- Niagara Region purchased a former cottage property on Lakeshore Rd. in Wainfleet and has developed it as a public beach. The NPCA currently maintains the property during the operating season.









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LAKE ERIE NORTH SHORE

- The Bert Miller Nature Club (BMNC) has commissioned the Lake Erie Coast Project which is looking to identify the occurrence and distribution of species at risk and their habitats. To date, this project has observed 21 species considered to be at risk. The Committee on the Status of Species at Risk in Ontario (COSSARO) ranks 6 of them as endangered, 7 as threatened, and 8 are considered a special concern. These present Species At Risk are comprised of 8 plant, 8 bird, 4 herptile, and 1 mammal species. In total, hundreds of species have been identified in the study area along the Lake Erie coast. BMNC has also been specifically monitoring Fowler's Toad populations (endangered Provincially and Nationally).
- The Port Colborne District Conservation Club has been actively working in the Lake Erie North Shore Watersheds since 1954 to promote the respect

and wise management of our natural resources. Since 2007 they have coordinated many public education events from fishing derbies to community clean ups and been involved in various restoration efforts including tree planting and walleye spawning bed creation and enhancement. Of particular note is the release of nearly 28,000 walleye, hatched and released back into Lake Erie Watershed helping the recovery of our declining native walleye population.

- The L3K Foundation and partners have implemented many conservation projects on their 20 hectare property in Port Colborne. Projects include wetland and forest habitat restoration, wood duck, blue bird and purple martin nesting box programs, and innovative projects like Planting for Pollinators. The L3K foundation plans include expanding all current programs and activities and integrating extensive project and wildlife monitoring to develop and refine ecosystem restoration techniques.
- The Lorraine Bay Water Quality Group (LBWQG) has been advocating for improved water quality within the Lake Erie Watersheds. Since 2007 the LBWQG has participated in the Lake Erie North Shore Watershed Plan Steering Committee, has partnered with the Lake Partner's Program Water Quality Sampling - Joint program with the MOE and Federation of Ontario Cottager's Association in order to provide water quality data. More recently they have also partnered with the Town of Port Colborne on the North Shore Task Force and helped commission the Lorraine Bay Water Quality Improvement Project which will see many improvements implemented in the watershed once funding is secured.

There has been much work done on research and improving the health of the Lake Erie North Shore Watersheds since 2007. 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 can be found in Appendix A.

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Lowbanks Drain

2012 Watershed Report Card



D

С

Surface Water Quality Forest Conditions



D

Surface Water Quality

Surface water quality monitoring of Lowbanks Drain on Lakeshore Road was initiated in 2007 and was given an overall grade of D. The water quality at the monitoring station regularly exceeded provincial guidelines for phosphorus and *E. coli*. This watershed also is prone to low baseflow conditions and algal blooms in the summer. The benthic community found at this station 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 Lowbanks Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	205	30 (Aquatic Life)	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
	Grade	D	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	158	100 (Recreation)	<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	С	В	
Benthic	(FBI)	7.94	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

GRADE C

The forest condition indicators for Lowbanks Drain watershed produced an overall grade of C. The Forest Cover % received a grade of B which is very good and close to the provincial target. The Forest Interior % with a grade of C was fair. The greatest contributing factor to these grades is the contiguous tracks of mature lowland forest spanning many properties along the western end of Minor Road. Riparian Zone Forested % was given a grade of D as in many cases, only one side of the watercourse is vegetated. A targeted restoration effort in this regard could go a long way in increasing the riparian %.

Indicato	ors	2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	26	30	Percent forest cover is the percentage of the watershed that is forested or
	Grade	В	В	wooded. Forest cover includes upland and lowland forest types.
Forest Interior	%	7.5	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
	Grade	С	В	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.
Riparian Zone Forested	%	17.8	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
	Grade	D	В	habitats support high numbers of wildlife species and provide an array of ecological functions.



Casey Drain

2012 Watershed Report Card



D

С

Surface Water Quality Forest Conditions



Surface Water Quality

Surface water quality monitoring of Casey Drain on Lakeshore Road was initiated in 2007 and was given an overall grade of D. The water quality at the monitoring station regularly exceeded provincial guidelines for phosphorus and *E. coli*. This watershed had frequent exceedances of total suspended solids and had regular summer algal blooms. The benthic community found at this station 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 Casey Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	245	30 (Aquatic Life)	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
	Grade	F	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	258	100 (Recreation)	<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	С	В	
Benthic	(FBI)	8.04	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

The forest condition indicators for Casey Drain watershed produced an overall grade of C. The Forest Cover % is very good and near the S. Ontario target due in large part to the efforts of a small group of landowners that have preserved the existing natural areas in the upper reaches. Riparian Zone Forested % and Forest Interior % indicators were both given a grade of D. Both of these indicators were far below the S. Ontario targets. Two very large stewardship projects were undertaken in 2012 in this watershed that will lead to future improvements for these two indicators.

Indicato	ors	2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	27	30	Percent forest cover is the percentage of the watershed that is forested or
	Grade	В	В	wooded. Forest cover includes upland and lowland forest types.
Forest Interior	%	6.1	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
	Grade	D	В	'edge' habitat and is prone to high predation, wind damage and alien species invasion.
Riparian Zone Forested	%	13.2	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
	Grade	D	В	support high numbers of wildlife species and provide an array of ecological functions.

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

GRADE

D

GRADE

С



Eagle Marsh Drain

2012 Watershed Report Card

GRADES Surface Water Quality

D

Forest



D

GRADE

D

Surface Water Quality

Surface water quality monitoring of Eagle Marsh Drain on Cement Road was initiated in 2007 and was given an overall grade of D. The water quality at the monitoring station regularly exceeded provincial guidelines for phosphorus and *E. coli*. This watershed exceeded chloride guidelines and had regular algal blooms in the summer. The benthic community found at this station 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 Eagle Marsh Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	70	30 (Aquatic Life)	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
	Grade	D	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	292	100 (Recreation)	<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	С	В	
Benthic	(FBI)	7.71	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

The forest condition indicators for Eagle Marsh Drain watershed produced an overall grade of D. The Forest Cover % with a grade of C and Forest Interior % with an F fall well short of the S. Ontario targets despite some large forest patches due to the lack of connectivity. Riparian Zone Forested % was given a grade of D which can also be attributed to the fragmentation of the natural cover in this watershed. Further voluntary stewardship efforts could help to connect existing forests in this watershed.

Indicators		2007 - 2011	S. Ont. Target**	Indicator Description
Format Course	%	15	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
Forest Cover	Grade	С	В	
Forest Interior	%	1.4	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
	Grade	F	В	'edge' habitat and is prone to high predation, wind damage and alien species invasion.
Riparian Zone Forested	%	15.0	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
	Grade	D	В	habitats support high numbers of wildlife species and provide an array of ecological functions.



Wignell Drain

2012 Watershed Report Card

GRADES

D

D

Surface Water Quality Forest

Conditions



D

Surface Water Quality

Surface water quality monitoring of Wignell Drain on Lakeshore Road was initiated in 2007 and was given an overall grade of D. The water quality at the monitoring station regularly exceeded provincial guidelines for phosphorus and *E. coli*. This watershed also had occasional exceedances of total suspended solids and copper. The benthic community found at this station 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 Wignell Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus _	(µg/L)*	230	30 (Aquatic Life)	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
	Grade	F	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	166	100 (Recreation)	<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	С	В	
Benthic	(FBI)	7.79	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

GRADE

D

The forest condition indicators for Wignell Drain watershed produced an overall grade of D. The Forest Cover % received a grade of D and the Forest Interior % received a grade of F, both well below the S. Ontario targets. Despite the existence of several large forested areas south of Second Concession, east of Reuter Road, and along the Lake Erie shoreline, the forested areas lack connectivity in this watershed. Riparian Zone Forested % was given a grade of C due to the successional nature of the vegetation existing along the municipal drain network. This watershed would benefit from voluntary stewardship aimed at connecting the existing remnant forest patches.

Indicato	ors	2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	10	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	В	
Forest Interior	%	0.1	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
	Grade	F	В	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.
Riparian Zone Forested	%	13.4	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
	Grade	С	В	habitats support high numbers of wildlife species and provide an array of ecological functions.



Beaver Dam Drain

2012 Watershed Report Card

GRADES Surface Water Quality

Forest Conditions

D



D

Surface Water Quality

Surface water quality monitoring of Beaver Dams Drain on Weaver Road was initiated in 2007 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 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 Beaver Dams Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	220	30 (Aquatic Life)	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
	Grade	F	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	190	100 (Recreation)	<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	С	В	
Benthic	(FBI)	8.37	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

GRADE

В

The forest condition indicators for Beaver Dams Drain watershed produced an overall grade of B. This is one of the highest grades in the NPCA watershed. The greatest contributing factor to this grade is the Weaver Road Woodlot. This contiguous expanse of natural area is a matrix of mature upland and lowland forests with successional areas providing linkages. Both Forest Cover % and Forest Interior % are near S. Ontario targets, but additional effort is required to achieve the Riparian Zone Forested % target.

Indicato	ors	2007 - 2011	S. Ont. Target**	Indicator Description
Format Course	%	28	30	Percent forest cover is the percentage of the watershed that is forested or
Forest Cover	Grade	В	В	wooded. Forest cover includes upland and lowland forest types.
Forest Interior	%	9.0	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
	Grade	В	В	'edge' habitat and is prone to high predation, wind damage and alien species invasion.
Riparian Zone Forested	%	31.6	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
	Grade	С	В	habitats support high numbers of wildlife species and provide an array of ecological functions.



Point Abino Drain

2012 Watershed Report Card

GRADES Surface Water Quality

D

Forest Conditions



D

Surface Water Quality

Surface water quality monitoring of Point Abino Drain on Point Abino Road was initiated in 2007 and was given an overall grade of D. The water quality at this station regularly exceeded provincial guideline for phosphorus but met the guideline for *E. coli*. This watershed also had occasional exceedances of total suspended solids and copper. The benthic community found at this station mainly consisted of pollutant tolerant animals and indicated impaired water quality. Watershed initiatives that reduce nutrient contamination will improve the water quality of Point Abino Drain.

Indica	ators	2007 - 2011	Provincial Guideline	Indicator Description
Phosphorus	(µg/L)*	115	30 (Aquatic Life)	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
	Grade	D	В	and rivers
Bacteria	(<i>E. coli/</i> 100ml)**	59	100 (Recreation)	<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	В	В	
Benthic	(FBI)	6.83	<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
	Grade	F	В	(FBI) scores each taxa according to its pollution tolerance.

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

Forest Conditions

GRADE B

The forest condition indicators for Point Abino Drain watershed produced an overall grade of B, among the highest in the entire Lake Erie North Shore watershed. The Forest Cover % received an excellent grade of A which exceeded the provincial target. The Forest Interior % with a grade of B was also very good. The greatest contributing factor to these grades is the contiguous tracks of diverse, mature upland and lowland forest running from Michener Road to the forested dunes on Lake Erie. Riparian Zone Forested % was given a grade of C. This grade is likely due to the successional nature of vegetation along the municipal drain network.

Indicato	ors	2007 - 2011	S. Ont. Target**	Indicator Description
Forest Cover	%	41	30	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and lowland forest types.
	Grade	А	В	
Forest Interior	%	11.1	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
	Grade	В	В	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.
Riparian Zone Forested	%	30.2	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
	Grade	С	В	habitats support high numbers of wildlife species and provide an array of ecological functions.